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Bao-Thy Le

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THÈSE

présentée par:

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Discipline/Spécialité : Sciences Économiques

**ESSAYS ON FOREIGN DIRECT INVESTMENT:
FIRM PRODUCTIVITY, REGIONAL EXTERNALITIES, AND
RESOURCE CURSE**

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ABBREVIATIONS

ASEAN	Association of Southeast Asian Nations
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GSO	General Statistics Office
IZ	Industrial Zone
MNE	Multinational Enterprise
PCI	Provincial Competitiveness Index
SOE	State-Owned Enterprise
SME	Small and Medium Enterprises
UNCTAD	United Nations Conference on Trade and Development
VCCI	Vietnam Chamber of Commerce and Industry
WTO	World Trade Organization
OECD	Organization for European Economic Cooperation
FEM	The fixed-effect model
REM	The random effect model

CHAPTER 1: GENERAL INTRODUCTION

1.1 Motivation

Foreign direct investment (FDI) is an investment from a party in one country into a business/corporation in another country with the aim of containing a lasting interest. Lasting interest differentiates FDI from foreign portfolio investments (FPI) involving the passive holding of securities, where investors have no control or direct ownership of stake or asset in a company. Foreign direct investment (FDI) is considered a key element in evolving international economic integration, also referred to as globalization. Nowadays, the issue of foreign direct investments is extremely investigated, both at the international and national levels. FDI is considered an important vehicle for local firm's development and helps improve the competitive position of both the foreign investors and the host country.

Particularly, FDI encourages the transfer of technology and knowledge-sharing between parties involving international trade, and thus, it creates opportunities for host countries to promote their products more widely in the global market. More importantly, FDI is also an essential source of capital for both developed and developing economies. Therefore, most developing countries recognize the potential value of investments abroad; and they conducted investment liberalization and provided FDI-attracting policy, and provided incentives to attract FDI from developed countries (De Mello Jr, 1997). On another side of the coin, FDI may also harm economic development, and many previous studies show the bad sides of FDI, such as: crowding out effect, negative wage spillovers, profit repatriation, infrastructure development constraint, and environmental issues. Dutch Disease's effects on the economy of Azerbaijan also bring a practical example about this side (Greenaway & Görg, 2002).

The significant growth in the level of FDI in recent decades and its international pervasiveness reflect an increase in the size and number of individual FDI transactions and the growing diversification of enterprises across economies and industrial sectors. In 2019, global FDI inflows fell a further 24.58 percent to US\$1.539 trillion after reaching a peak of US\$2.04 trillion in 2015. Compared with the previous year, the world's total FDI rose 3 percent higher than in 2018, following sizable declines in 2017. From 2010 - 2019, half of the top twenty host economies were developing and transition countries. Before the 1990s, North American and Western European countries have received a large share of FDI inflow.

Nonetheless, there has been a significant shift of FDI inflows into developing countries since the 1990s. Table 1.1 shows that the largest receiver of FDI was the United States of America; China received the second-largest share behind the United States of America,

followed by Singapore. In contrast, some European countries became less popular for attracting FDI inflows. The world's largest source of investments comes from Japan, the United States of America, and the Netherlands.

Table 1.1: Top 20 countries leading in FDI inflows and Outflows

Foreign direct inflows, top 20 countries, 2019			Foreign direct outflows, top 20 countries, 2019		
Country (ranked by value)	Value	Ratio to GDP	Country (ranked by value)	Value	Ratio to GDP
United States of America	246	1.1	Japan	227	4.5
China	141	1	United States of America	125	0.6
Singapore	92	25.5	Netherlands	125	13.8
Netherlands	84	9.3	China	117	0.8
Ireland	78	20.2	Germany	99	2.6
Brazil	72	4	Canada	77	4.4
China, Hong Kong SAR	68	18.5	China, Hong Kong SAR	59	16.1
United Kingdom	59	2.1	France	39	1.4
India	51	1.7	Korea, Republic of	36	2.1
Canada	50	2.9	Singapore	33	9.2
Germany	36	1	United Kingdom	31	1.1
Australia	36	2.6	Italy	25	1.3
France	34	1.3	Spain	24	1.7
Mexico	33	2.6	Sweden	23	4.3
Russian Federation	32	1.9	Russian Federation	23	1.3
Italy	27	1.3	Belgium	20	3.7
Cyprus	24	99	Ireland	18	4.7
Indonesia	23	2.1	Denmark	16	4.6
Sweden	21	3.9	United Arab Emirates	16	3.9
Iraael	18	4.7	Brazil	16	0.9

Source: World Investment Report 2019 (UNCTAD)

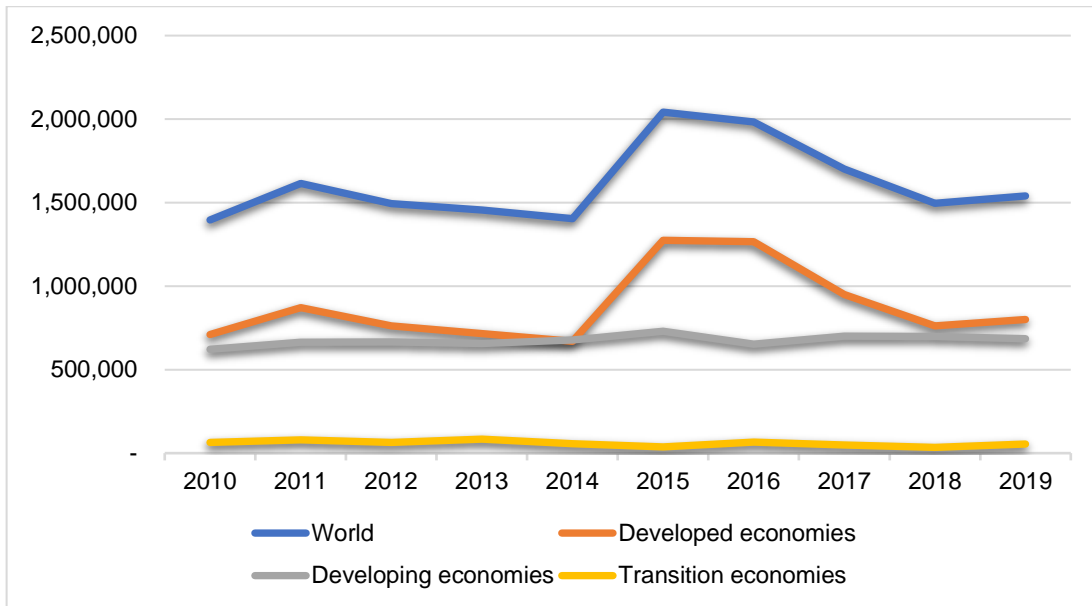


Figure 1.1: FDI inflows by group of economies, 2010 – 2019 (Billions of dollars)

Source: UNCTAD, FDI/MNE database (www.unctad.org/fdistatistics).

In developing economies, FDI inflows amounted to US\$684 billion, almost double the value of FDI outflows US\$373 billion. More than two-thirds of all developing economy inflows are pouring into Asia and Oceania region. In contrast, developed countries generate more FDI than they receive, their record inflows of US\$800 billion and outflows of US\$916 billion.

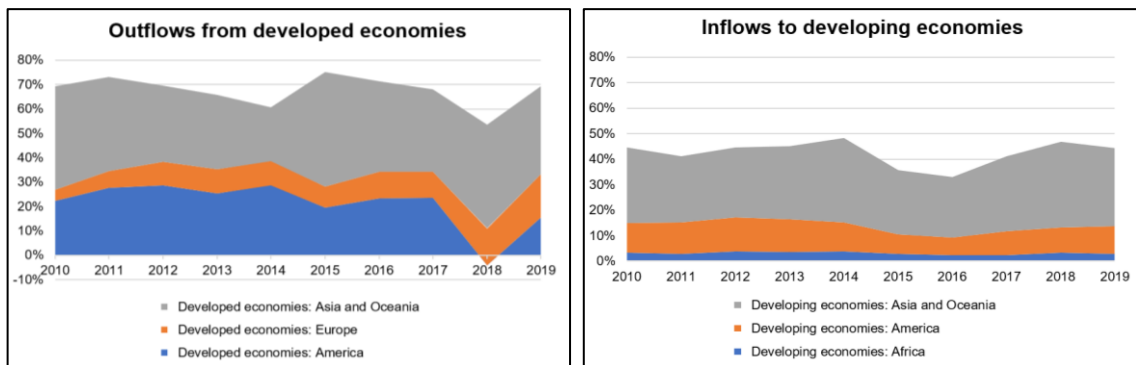


Figure 1.2: Selected foreign direct investment flows (Percentage of world total)

Source: UNCTAD, FDI/MNE database (www.unctad.org/fdistatistics).

As shown in Figure 1.3, the global total of announced greenfield projects¹ is reflected in three different trends of FDI regarding Africa, Latin America, the Caribbean, and Asia. In general, announced greenfield projects in manufacturing increased significantly in Asia and Africa. Asia is the top leading of announced greenfield projects in manufacturing with a 70 percent increase in 2018. In line with the same growth of investment in higher-skill and lower-skill industries compared with the previous stage, we saw an impressive speed of natural resource-related sectors² in manufacturing, which shows almost double value in Asia.

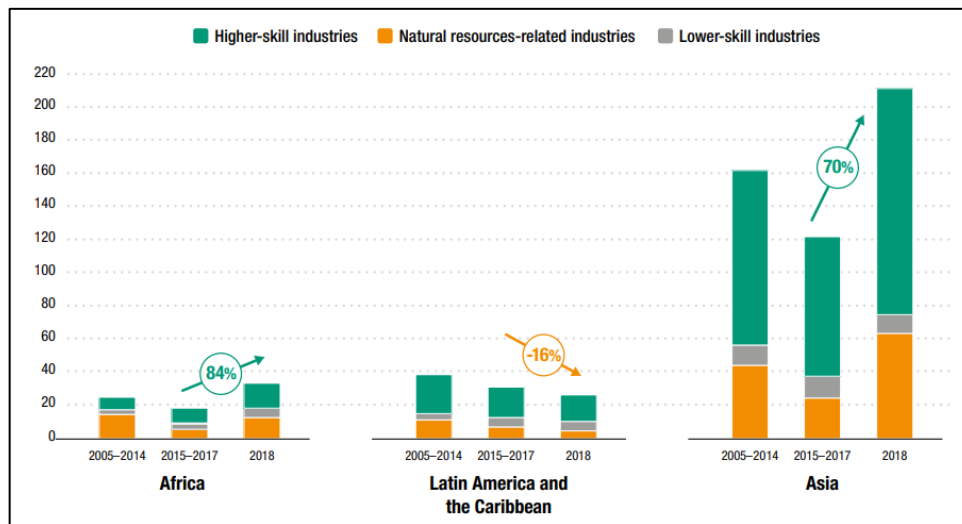


Figure 1.3: The global value of announced greenfield FDI projects in manufacturing, 2005 – 2018 (Billions of dollars and percent)

Source: World Investment Report 2019 – UNCTAD, based on information from the Financial Times Ltd, fDi Markets (www.fDimarkets.com)

According to (Moosa, 2002), the effects of FDI on an investment host country can be of three types: economic, political, and social. In short, the social issue mainly concerns creating enclaves and foreign elite in the host country and cultural and behavioral changes as a consequence of a sort of ‘‘contamination’’ resulting from the contact between the foreign and local entities. Although the literature on FDI impacts in developing countries has experienced

¹ Greenfield FDI is a type of foreign direct investment (FDI) where the company begins a new venture by constructing new facilities in that country. Whereas brownfield FDI is an investment undertaken where a company invests in an existing facility to start its operations in a foreign country. An important form of Brownfield investment is merger and acquisition by MNEs.

² Natural resources-related industries include (i) coke, petroleum products and nuclear fuel; (ii) metals and metal products; (iii) non-metallic mineral products; and (iv) wood and wood products.

Lower-skill industries include (i) food, beverages and tobacco and (ii) textiles, clothing and leather; industries requiring higher-skill include all other manufacturing industries.

a large acceleration in the last decades, the implication concluded after several empirical studies on the relationship between FDI and economic development is that the effects of FDI are complex. A large body of theoretical and empirical literature often focuses on two main approaches, as shown in Figure 1.4 below.

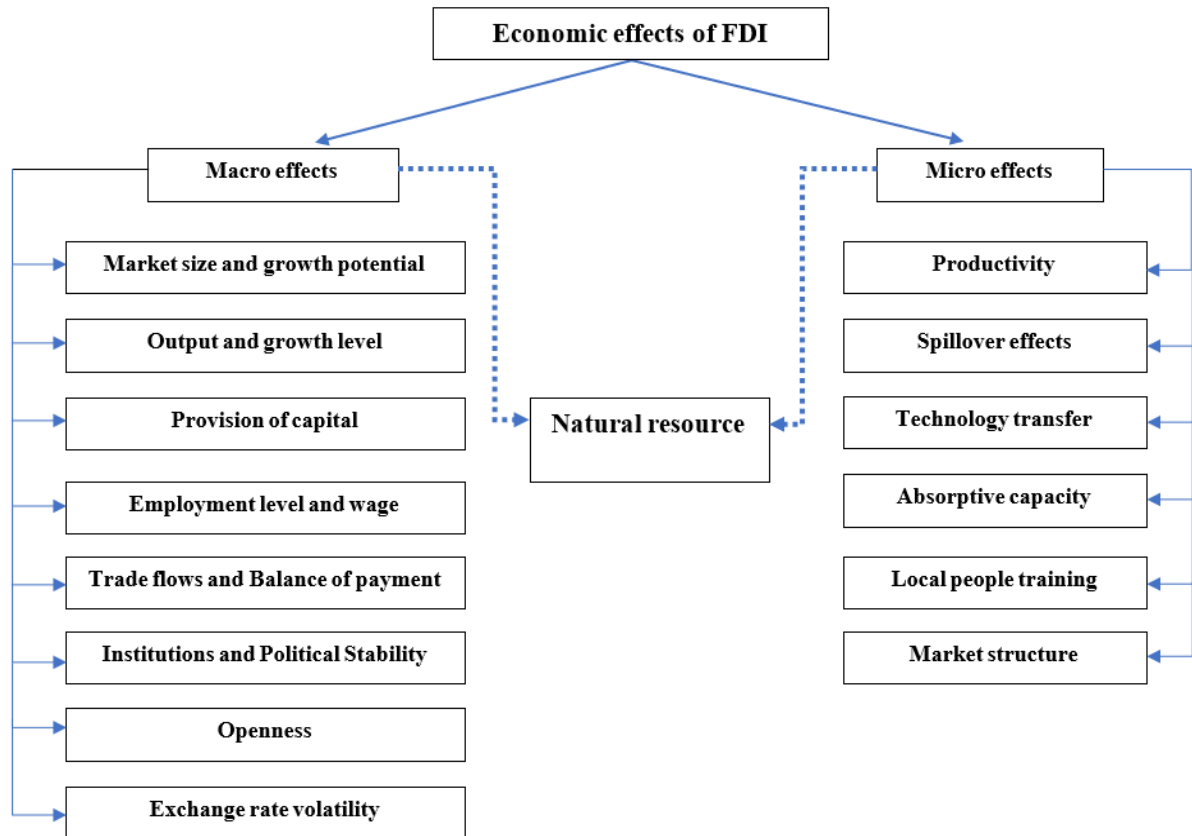


Figure 1.4: Economic effects of FDI

From a macro perspective, the literature considers FDI as a particular form of capital flow across borders at the national level. Many studies try to investigate the relationship between FDI and several macroeconomic variables such as market size and potential growth of the host market (Bevan & Estrin, 2000; Resmini, 2000), economic growth and development (Alfaro et al., 2004; Azman-Saini et al., 2010; Liang et al., 2021; Tiwari & Mutascu, 2011), employment level and wage (Becker et al., 2020; Blanas et al., 2019; Rong et al., 2020; Saucedo et al., 2020), balance of payment (Iavorschi, 2014; JAFFRI et al., 2012; Kinuthia & Murshed, 2015), openness degree (Resmini, 2000; Singh & Jun, 1995), institutional quality (Borojo & Yushi, 2020; Buchanan et al., 2012; Fon et al., 2021), exchange rate volatility (Dhakal et al., 2010; Kiyota & Urata, 2004; Latief & Lefen, 2018). Moreover, many studies examine issues such as why FDI enters (Blalock & Simon, 2009; Chung et al., 2003; Konings, 2001; Smarzynska Javorcik, 2004), when FDI enters (Saggi, 1998), where FDI enters (Ford et al., 2008;

Monastiriotis, 2014; Ni et al., 2017), and how FDI enters (Shirodkar & Mohr, 2015) into the host country.

From a micro perspective, beyond structural changes in the economic and macro-level outputs, the earlier studies try to approach firm-level data in industries and regions of a single nation. However, the results provided often focus on estimation of proxies related to “total factor productivity,” “labor productivity,” or “spillover effects.” The impact of FDI on a firms’ productivity is classified into two categories: direct and indirect effects for various industries/regions. Most of the papers related to the direct effect of FDI-inflows focus on its impact on the productivity of domestic firms or the comparison between foreign and domestic firms in a specific industry or location, as we can mention through series of studies in different countries such as the United States (Doms & Jensen, 1998), the United Kingdom (Davies & Lyons, 1991), Canada (Globerman et al., 1994), Japan (Kimura & Kiyota, 2007). Indirect effects focus on FDI presence in the productivity of domestic firms through FDI spillover effects through horizontal, backward, and vertical effects. One of the micro-level studies’ primary challenges is the dataset’s limitation at the firm level, preventing us from differentiating between direct and indirect effects. Although the productivity channel is essential, there is no guarantee that a domestic firm experiencing a positive impact from FDI spillover will necessarily be a net winner from FDI. A primary challenge facing the FDI literature has been the absence of a global source of firm-level data. Instead, previous authors have used MNEs’ activities at the industry level or total FDI flows from balance-of-payments statistics to proxy foreign firm activity or country-level firm data. Especially in developing countries, cross-country empirical studies at the firm level are limited due to the lack of high-quality datasets, infrequency of the national survey, high cost, and institutional restrictions.

There are different goals and motivations that foreign investors target to invest in a country, such as natural-resource-seeking, market-seeking, efficiency-seeking, and strategic-asset-seeking. One of their objectives is to get access to a natural resource not available in the company’s home market because of the unbalanced distribution of natural resources in each country. Thus, there is a widespread idea that countries with resource abundance motivate more FDI than poor-resource countries. However, recent studies have observed that countries rich in natural resources attract less FDI than resource – poor countries (E Asiedu, 2013; Poelhekke & Van Der Ploeg, 2013; Poelhekke & van der Ploeg, 2010). Compelling empirical literature exists on FDI (see Figure 1.4); it must be highlighted that the economic effects of FDI have very often failed to consider those associated with the natural resource sector. Most studies focus on manufacturing sectors at the national level, firm-level, industrial level, or regional

level, and, surprisingly, few researchers have addressed the relationship between the natural resources sector and FDI. Regarding the “FDI resource curse” issue, the previous authors focus on testing whether the natural resource is a curse or blessing by empirical results at a single nation or group of countries rather than finding out the explanation for this issue.

We focus on Vietnam context – a developing country for two main reasons:

Due to the significant amount of FDI, Viet Nam provides a good case to study the impact of FDI presence on the productivity of domestic firms. Besides, the Vietnamese context is distinct from that in developed countries. The heritage from central planning and the ongoing transition process also distinguishes Viet Nam from many other developing economies. After 30 years since political and economic reforms started opening Vietnam’s economy to the rest of the world, Vietnam’s market reforms in the late 1980s resulted in positive socio-economic transformations. This reform has brought out dramatic changes to the economy in all aspects. In particular, Vietnam’s economy has gradually shifted focus from agriculture to industry and services, and international exports continue to grow. As a result, Vietnam has emerged as among the most dynamic and rapid growth countries. Among the determinants leading to this success, Foreign Direct Investment has been believed to play a crucial role. A country can be turned into an attractive market and investment destination through various legal and bureaucratic reforms, especially incentive programs for foreign investors.

According to World Investment Report, China has been the largest recipient of FDI in developing Asia in 2017. However, the trend is changing from China to Southeast Asian countries, including Vietnam. According to (Lee & Folkmanis, 2013), Samsung, for example, is shifting their operation to Vietnam to secure even minimum wages and protect profit margins as growth in sales due to low labor cost, openness to trade, and an advantageous geographic location. Samsung's case also shows an example that MNEs will actively and continuously evaluate their FDI options. Over the past few years, the trend of MNEs moving out or diversifying their production away from China is starting to alarm policymakers in Vietnam. This situation may be similar to Vietnam in the near future since rising labor costs can cause this country to lose one of the most attractive features for MNEs to maintain their production.

Overall, international trade and FDI bring Vietnam many benefits such as creating more employment, upskill the workforce, contributing to tax revenue, and increasing labor income. FDI projects also support the transfer of technologies to Vietnam and generate spillover effects through local firms in regions. But the dark side of this is Vietnam's over-reliance on exports, and FDI has been a potential problem. According to data from the GSO, while the FDI sector accounted for 30% of GDP, they contribute approximately 70% of total export turnover. With

its remarkable contribution to export performance, four major subsidiaries of Samsung Vietnam also earned a total revenue of US\$63.25 billion and US\$3.8 billion in profit in 2020, making it the largest foreign investor and one of the biggest employers in Vietnam. While the role of FDI is growing in the economy, the number of bankrupt and deactivated enterprises in Vietnam is increasing. While FDI enterprises take advantage of the economy's recovery and incentives for foreign investment enterprises, local businesses are completely overshadowed. The failure of local enterprises reflects the weaker internal strength of domestic firms. In this respect, the expected spill-over effect from FDI is still limited. There is surprisingly little work on the impacts of FDI presence on the productivity of domestic firms in Vietnam.

Since the early 1990s, Vietnam has implemented regional decentralization for better State management and promote democracy at the sub-national level. The Investment Law of 2005 has taken a further step by establishing an open and fair environment for all investors while simplifying the registration procedures for foreign investment. Accordingly, the central government assigned local government's great autonomy over their economies, which included granting business licenses, land access, access to public utilities, and fiscal policies such as tax schemes and incentives. Local governments are also allowed to approve FDI projects up to a certain limit. One can say that foreign direct investment (FDI) management is one of the most strongly decentralized sectors. However, the FDI decentralization management in Vietnam has some limitations. Although Vietnam has a positive and encouraging attitude toward FDI, the implementation of FDI-attracting policies are usually localized and not uniform across regions. Local governments could externalize a significant impact on foreign investor's business operations. Bruton & Ahlstrom (2003) found evidence that the institutional environment creates several significant differences between regions in China. Foreign firms faced institutional challenges such as the difference in legal and law systems across regions, intervention by bureaucrats and regulators, and the problem of bribes and corruption distorting law enforcement. Since the central government grants more power of incentives to FDI-recipient provinces, more FDI pours into a sector could provide leaders of those provinces with growing opportunities and increased abilities to pursue rents, leading to a prevalence of corruption. This issue raised whether bribes, corruption, and fiscal distortion could impact FDI inflows, especially resource-related sectors.

In addition, facing different institutional environments, foreign investors tend to adjust their strategies to local government quality or target the location where the local government quality is most beneficial to their business operations. Regional decentralization and local government quality are therefore expected to influence FDI inflows at the local level. The

existing literature, however, has not paid sufficient attention to this issue. Examining the externalities of FDI extends the understanding of FDI locations and sheds light on the broader issues of economic development. It helps local authorities to improve institutional quality in their regions and attract external resources to develop local economies.

1.2 Thesis structure and Contributions

The thesis consists of three contributions on FDI and economic performance nexus, two of which address manufacturing sectors by empirical results and the last one involved with the natural resource sector by the theoretical model.

Chapter 2: Does Foreign Direct Investment Boost the Productivity of Domestic Firms? Evidence from Vietnam Manufacturing Firms? (with Prof. Nguyen-Van Phu)

As mentioned above, one of the tough challenges for all researchers in the existing literature is the absence of a global source of data at the firm level. To have a global view of the FDI-productivity relationship, we lack the empirical results to compare different regions and countries globally. Previous studies at the firm level of a single country or groups of countries are limited by the lack of high-quality datasets, especially in developing countries. Using panel data of 123,400 manufacturing firms from Vietnam's Enterprise Survey between 2000 and 2017, we suggest that the full difference in difference model (DID) identifies the impacts of FDI presence in a region on the total factor productivity of domestic firms. Unlike most previous studies, we compare the difference in FDI presence impact on local firms' productivity and report how the FDI effect differs between firms established before and after FDI enters a region. In addition, this chapter also clarifies the factors (firm's size, foreign ownership, and state ownership) that influence the results that domestic firms win or fail from the presence of FDI in their domestic markets. By analyzing two groups of long-lived and young firms for two periods (post and pre-treatment period), the DID method provides more reliable estimates of FDI effects than traditional methods such as regression adjustment to separate the net FDI effect without mixing the other treatment. Furthermore, we also provide a regional-based region regression for the northern, central, and southern zones beside benchmark regressions.

Chapter 3: FDI agglomeration, geography, and provincial factors: Evidence from provincial productivity in Vietnam.

According to the effective FDI law amendment in 1996, decentralization policy is implemented to provide more power and autonomy in processing foreign investment activities such as issuing investment licenses, land rent, recruiting labor, and providing export and import

licenses. On the one side, this policy allows provincial authorities to develop innovative ways to attract more foreign investors, but on the other side, it leads to variations in characteristics of its investment environment across different regions. Thus, different areas possess unique features that provide distinctive sources of competitive advantage for both foreign and domestic firms. A micro-data level study allows for more granular regional differences analysis based on the firm-level data of 63 provinces over the period 2010 - 2017. It offers more accurate evidence for location determinants such as labor cost, market size, market demand, and local governance quality that affect provincial productivity. The initial idea is that firm heterogeneity interacts with location factors and local governance quality, shaping a province's locations and agglomeration behaviors. This chapter's objective is to explore how location factors and local governance quality affect provincial productivity. Moreover, using the spatial econometric model and weight matrix of FDI location and their neighborhood helps us investigate how an area with a high level of FDI concentration could externalize its agglomeration effects to a region and spillovers to the nearby locations.

Chapter 4: Toward an alternative explanation for the natural resource curse: Bribe and fiscal policy (with Prof. Jocelyn Donze)

A closer look at the literature on FDI shows that previous studies have almost exclusively focused on the issue of the economic effects of FDI in manufacturing sectors. However, several gaps and shortcomings in the literature related to the relationship between the natural resource sector and FDI. Related to FDI and the natural resource nexus, many studies explain the natural resource curse, commonly known as the phenomenon of countries with natural resource abundance but underperforms economically compared to poor resource countries. Revisiting the "FDI resource curse" issue, Chapter 4 proposes a different explanation of the FDI resource curse by building a model with corruption and fiscal policy. This study is also one of the first attempts to provide a comprehensive analysis by the theoretical framework by comparing a benchmark model (with one representative foreign firm) in which FDI takes only place in the non-resource sector to a full model (with two representative foreign firms) in which FDI takes place in the non-resource and the resource sectors. Besides providing an alternative explanation to the FDI resource curse, this chapter also analyzes the interplay between corruption and fiscal policy. It provides a possible explanation of the existence of oversized projects in the natural resource sector.

This introductory chapter overviews the issues, gaps in theoretical and empirical studies, and the contributions of our work to the literature on the nexus between foreign direct

investment, economic performance and natural resource. We will tackle the three following questions:

1. Does Foreign Direct Investment Boost the Productivity of Domestic Firms?
2. How do FDI agglomeration, geography, and local governance quality affect provincial productivity?
3. Do corruption and fiscal policy matter in explaining the FDI natural resource curse?

Appendix

CHAPITRE 1 : INTRODUCTION GÉNÉRALE

1.1 Motivation

L'investissement direct étranger (IDE) est un investissement de long terme d'une entreprise/société d'un pays dans une entreprise/société d'un autre pays. Le long terme différencie les IDE des investissements étrangers en portefeuille (IEP) impliquant la détention passive de titres, où les investisseurs n'ont pas le contrôle ou la propriété directe d'une participation ou d'un actif dans une société. Contrairement aux IEP, les investissements directs à l'étranger sont réalisés en développant l'entreprise dans un pays étranger et en s'impliquant directement dans les opérations quotidiennes dans un autre pays; l'objectif étant de créer un intérêt durable. L'investissement direct étranger (IDE) est considéré comme un élément clé de l'évolution de l'intégration économique internationale, également appelée mondialisation. De nos jours, la question des investissements directs étrangers est extrêmement étudiée, tant au niveau international que national. L'IDE est non seulement considéré comme un vecteur important du développement des entreprises locales, mais il contribue également à améliorer la position concurrentielle des investisseurs étrangers et du pays d'accueil. En particulier, les IDE encouragent le transfert de technologie et le partage des connaissances entre les parties impliquées dans le commerce international, ce qui permet aux pays d'accueil de promouvoir plus largement leurs produits sur le marché mondial. Plus important encore, l'IDE est également une source importante de capitaux pour les économies développées et en développement. Par conséquent, la plupart des pays en développement reconnaissent la valeur potentielle des investissements à l'étranger, ils ont procédé à la libéralisation des investissements et ont mis en place des politiques et des incitations pour attirer les IDE des pays développés (De Mello Jr, 1997). D'un autre côté, les IDE peuvent également nuire au développement économique, de nombreuses études antérieures montrent les mauvais côtés des IDE tels que: l'effet d'éviction, les retombées salariales négatives, le rapatriement des bénéfices, les contraintes de développement des infrastructures et les problèmes environnementaux. Les effets du syndrome hollandais sur l'économie de l'Azerbaïdjan constituent également un exemple pratique de cet aspect (Greenaway & Görg, 2002).

La croissance significative du niveau des IDE au cours des dernières décennies, et leur omniprésence internationale, reflètent à la fois une augmentation de la taille et du nombre de transactions individuelles d'IDE, ainsi que la diversification croissante des entreprises à travers les économies et les secteurs industriels. En 2019, les flux mondiaux d'IDE ont encore chuté de 24,58 % pour atteindre 1 539 milliards de dollars américains, après avoir atteint un pic de 2 04

milliards de dollars américains en 2015. Par rapport à l'année précédente, le total mondial des IDE a augmenté de 3 % par rapport à 2018, après des baisses notables en 2017. De 2010 à 2019, la moitié des vingt premières économies d'accueil étaient des pays en développement et en transition. Avant les années 1990, les pays d'Amérique du Nord et d'Europe occidentale ont reçu une grande partie des flux d'IDE. Néanmoins, on observe un déplacement significatif des flux d'IDE vers les pays en développement depuis les années 1990. Le tableau 1.1 montre que le plus grand récepteur d'IDE était les États-Unis d'Amérique, la Chine a reçu la deuxième plus grande part derrière les États-Unis d'Amérique, suivie de Singapour, certains pays européens sont devenus moins populaires pour attirer les flux d'IDE. La plus grande source d'investissements dans le monde provient du Japon, des États-Unis d'Amérique et des Pays-Bas.

Table 1.1: Top 20 countries leading in FDI inflows and Outflows

Foreign direct inflows, top 20 countries, 2019			Foreign direct outflows, top 20 countries, 2019		
Country (ranked by value)	Value	Ratio to GDP	Country (ranked by value)	Value	Ratio to GDP
United States of America	246	1.1	Japan	227	4.5
China	141	1	United States of America	125	0.6
Singapore	92	25.5	Netherlands	125	13.8
Netherlands	84	9.3	China	117	0.8
Ireland	78	20.2	Germany	99	2.6
Brazil	72	4	Canada	77	4.4
China, Hong Kong SAR	68	18.5	China, Hong Kong SAR	59	16.1
United Kingdom	59	2.1	France	39	1.4
India	51	1.7	Korea, Republic of	36	2.1
Canada	50	2.9	Singapore	33	9.2
Germany	36	1	United Kingdom	31	1.1
Australia	36	2.6	Italy	25	1.3
France	34	1.3	Spain	24	1.7
Mexico	33	2.6	Sweden	23	4.3
Russian Federation	32	1.9	Russian Federation	23	1.3
Italy	27	1.3	Belgium	20	3.7
Cyprus	24	99	Ireland	18	4.7
Indonesia	23	2.1	Denmark	16	4.6
Sweden	21	3.9	United Arab Emirates	16	3.9
Israel	18	4.7	Brazil	16	0.9

Source: World Investment Report 2019 (UNCTAD)

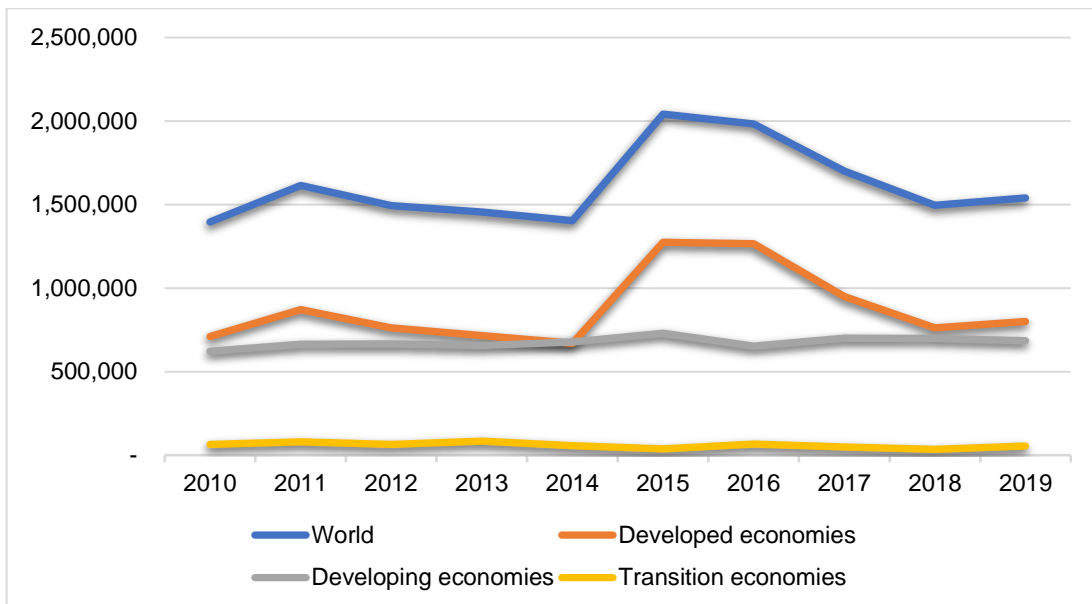


Figure 1.1: FDI inflows by group of economies, 2010 – 2019 (Billions of dollars)

Source: UNCTAD, FDI/MNE database (www.unctad.org/fdistatistics).

Dans les économies en développement, les entrées d'IDE se sont élevées à 684 milliards d'USD, soit près du double de la valeur des sorties d'IDE (373 milliards d'USD). Plus des deux tiers de tous les flux entrants des économies en développement se déversent dans la région Asie et Océanie. En revanche, les pays développés génèrent plus d'IDE qu'ils n'en reçoivent, leurs flux entrants records s'élevant à 800 milliards d'USD et leurs flux sortants à 916 milliards d'USD.

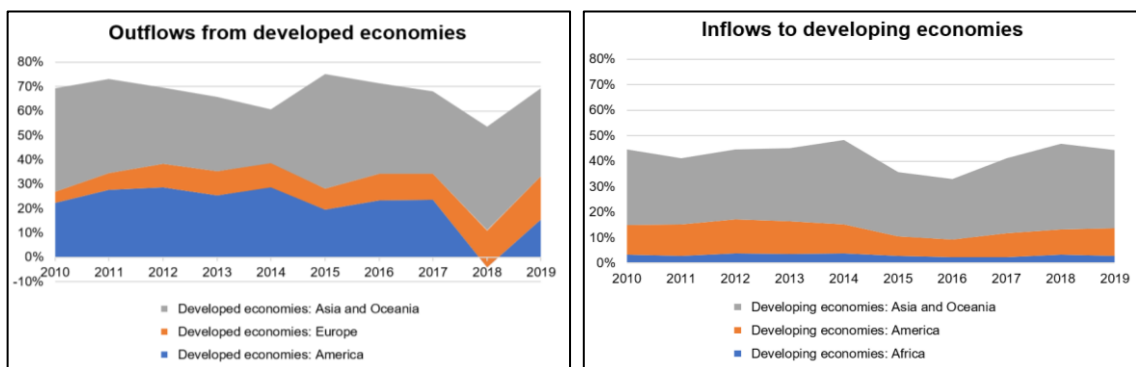


Figure 1.2: Selected foreign direct investment flows (Percentage of World total)

Source: UNCTAD, FDI/MNE database (www.unctad.org/fdistatistics).

Comme on peut le voir dans le graphique 1.3, le total mondial des projets greenfield annoncés se reflète dans trois tendances différentes d'IDE concernant l'Afrique, l'Amérique latine, les Caraïbes et l'Asie. En général, les projets de création de sites vierges annoncés dans

le secteur manufacturier ont augmenté de manière significative en Asie et en Afrique. L'Asie est le premier chef de file des projets greenfield annoncés dans le secteur manufacturier avec une augmentation de 70 % en 2018. Dans la lignée de la même croissance des investissements dans les industries plus ou moins qualifiées par rapport à l'étape précédente, nous avons constaté une vitesse impressionnante des industries liées aux ressources naturelles dans le secteur manufacturier, qui affiche une valeur presque double en Asie.

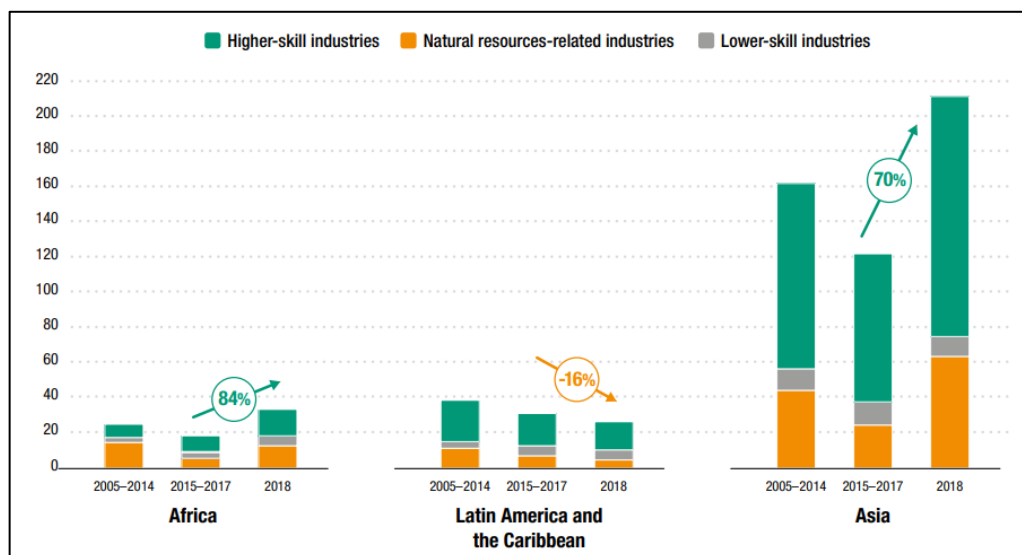


Figure 1.3: The global value of announced greenfield FDI projects in manufacturing, 2005 – 2018 (Billion of dollars and percent)

Source: World Investment Report 2019 – UNCTAD, based on information from the Financial Times Ltd, fDi Markets (www.fDimarkets.com).

Selon (Moosa, 2002), les effets des IDE sur un pays d'accueil peuvent être de trois types: économiques, politiques et sociaux. En résumé, la question sociale concerne principalement la création d'enclaves et d'élites étrangères dans le pays d'accueil, ainsi que les changements culturels et comportementaux résultant d'une sorte de " contamination " résultant du contact entre les entités étrangères et locales. Bien que la littérature sur les impacts des IDE dans les pays en développement ait connu une forte accélération au cours des dernières décennies, la conclusion tirée de plusieurs études empiriques sur la relation entre les IDE et le développement économique est que les effets des IDE sont complexes. Une grande partie de la littérature théorique et empirique se concentre souvent sur deux approches principales, comme le montre la figure 1.4 ci-dessous.

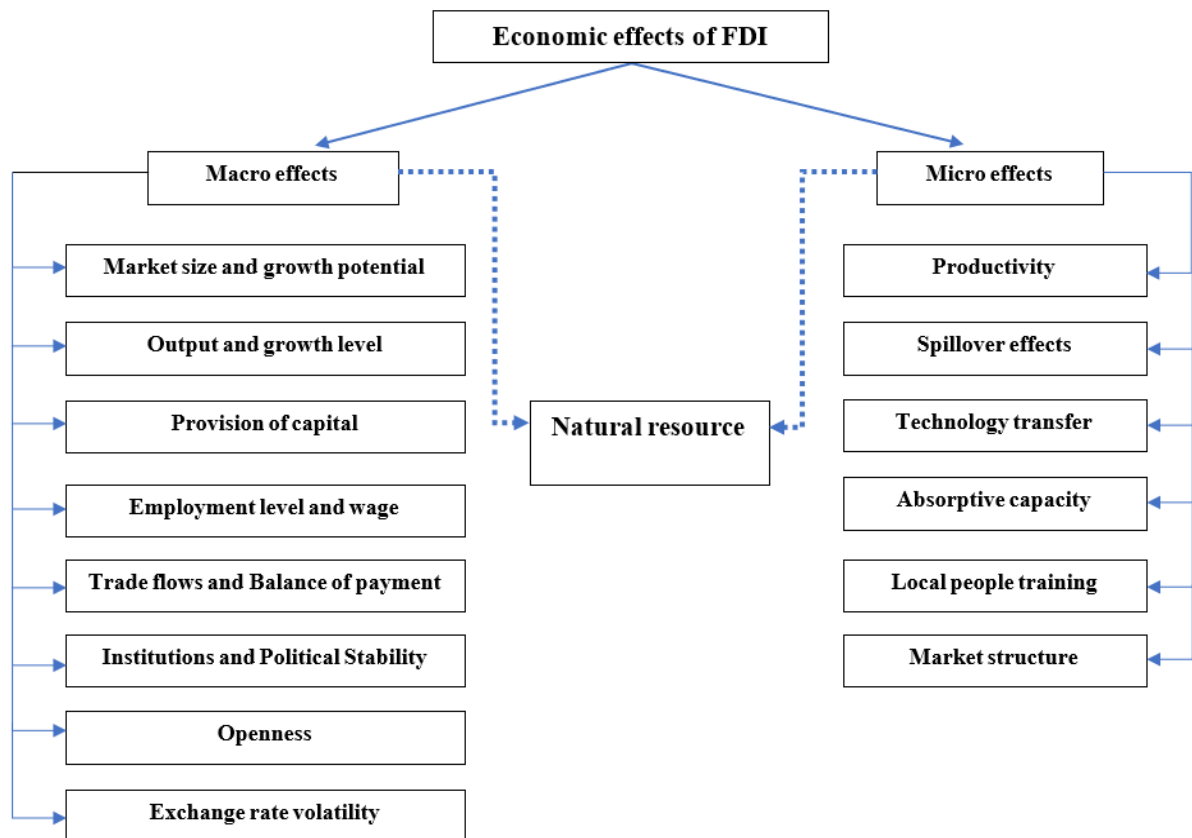


Figure 1.4: Economic effects of FDI

D'un point de vue macroéconomique, les auteurs précédents considèrent les IDE comme une forme particulière de flux de capitaux transfrontaliers au niveau national. De nombreuses études tentent d'examiner la relation entre les IDE et plusieurs variables macroéconomiques telles que la taille du marché et la croissance potentielle du marché d'accueil (Bevan & Estrin, 2000; Resmini, 2000), la croissance économique et le développement (Alfaro et al., 2004; Azman-Saini et al., 2010; Liang et al., 2021; Tiwari & Mutascu, 2011), le niveau d'emploi et le salaire (Becker et al., 2020; Blanas et al., 2019; Rong et al., 2020; Saucedo et al., 2020), la balance des paiements (Iavorschi, 2014; JAFFRI et al., 2012; Kinuthia & Murshed, 2015), le degré d'ouverture (Resmini, 2000; Singh & Jun, 1995), la qualité des institutions (Borojo & Yushi, 2020; Buchanan et al., 2012; Fon et al., 2021), la volatilité du taux de change (Dhakal et al., 2010; Kiyota & Urata, 2004; Latief & Lefen, 2018). En outre, de nombreuses études examinent des questions telles que les raisons pour lesquelles les IDE entrent (Blalock & Simon, 2009; Chung et al., 2003; Konings, 2001; Smarzynska Javorcik, 2004), quand les IDE entrent (Saggi, 1998), où les IDE entrent (Ford et al., 2008; Monastiriotis, 2014; Ni et al., 2017), et comment les IDE entrent (Shirodkar & Mohr, 2015) dans le pays d'accueil.

D'un point de vue microéconomique, au-delà des changements structurels dans les résultats économiques et macroéconomiques, les études antérieures tentent d'approcher les

données au niveau de l'entreprise dans les industries, les régions d'une seule nation, mais les résultats fournis se concentrent souvent sur l'estimation des approximations liées à la " théorie L'impact des IDE sur la productivité d'une entreprise est classé en deux catégories : les effets directs et indirects sur les différentes industries/régions. La plupart des articles relatifs à l'effet direct des flux d'IDE se concentrent sur son impact sur la productivité des entreprises nationales ou sur la comparaison entre les entreprises étrangères et nationales dans une industrie ou un lieu spécifique, comme nous pouvons le mentionner à travers une série d'études dans différents pays tels que les États-Unis (Doms & Jensen, 1998), le Royaume-Uni (Davies & Lyons, 1991), le Canada (Globerman et al., 1994), le Japon (Kimura & Kiyota, 2007). Les effets indirects se concentrent sur la présence des IDE dans la productivité des entreprises nationales par le biais des retombées des IDE à travers des effets horizontaux, en amont et verticaux. L'un des principaux défis des études au niveau micro est la limitation de l'ensemble de données au niveau de l'entreprise qui nous empêche de différencier les effets directs et indirects. Bien que le canal de la productivité soit important, il n'y a aucune garantie qu'une entreprise nationale subissant un effet positif des retombées de l'IDE sera nécessairement un gagnant net de l'IDE. L'absence d'une source mondiale de données au niveau de l'entreprise a constitué un défi majeur pour la littérature sur les IDE. Les auteurs précédents ont plutôt utilisé les activités des EMN au niveau de l'industrie ou les flux totaux d'IDE provenant des statistiques de la balance des paiements comme une approximation de l'activité des entreprises étrangères ou des données sur les entreprises au niveau du pays. Les études empiriques transnationales au niveau des entreprises sont limitées par le manque d'ensembles de données de haute qualité, qui ont tendance à être limitées à l'avance, et difficiles à comparer entre les pays. En raison de la rareté des enquêtes nationales, en particulier dans les pays en développement, de leur coût élevé et des restrictions institutionnelles. En outre, la source de données est limitée par des restrictions de confidentialité qui rendent difficile l'accès et le traitement des données.

Les investisseurs étrangers poursuivent un ensemble de buts et de motivations différents pour investir dans un pays, tels que la recherche de ressources naturelles, la recherche de marchés, la recherche d'efficacité et la recherche d'actifs stratégiques. L'une de leurs tentatives est d'avoir accès à une ressource naturelle qui n'est pas disponible sur le marché national de l'entreprise en raison de la répartition déséquilibrée des ressources naturelles dans chaque pays. Ainsi, il existe une idée répandue selon laquelle certains pays disposant d'abondantes ressources motivent davantage les IDE. Cependant, des études récentes ont observé que les pays riches en ressources naturelles attirent moins les IDE que les pays pauvres en ressources (E Asiedu, 2013; Poelhekke & Van Der Ploeg, 2013; Poelhekke & van der Ploeg, 2010). Il existe une littérature empirique convaincante sur les IDE (voir Figure 1.4), il faut souligner que la question des effets

économiques des IDE a très souvent omis de prendre en compte ceux associés au secteur des ressources naturelles. La plupart des études se concentrent sur les secteurs manufacturiers au niveau national, au niveau des entreprises, au niveau industriel ou au niveau régional. Il est surprenant que peu de chercheurs aient abordé la question de la relation entre le secteur des ressources naturelles et les IDE. En ce qui concerne la question de la "malédiction des ressources des IDE", les auteurs précédents se concentrent sur le test de savoir si les ressources naturelles sont une malédiction ou une bénédiction par des résultats empiriques au niveau d'une seule nation ou d'un groupe de pays plutôt que de trouver l'explication de cette question.

Nous nous concentrons sur le contexte du Vietnam - un pays en développement - pour deux raisons principales :

En raison du montant important des IDE, le Vietnam constitue un bon cas pour étudier l'impact de la présence des IDE sur la productivité des entreprises nationales. En outre, le contexte vietnamien est distinct de celui des pays développés. L'héritage de la planification centrale et le processus de transition en cours distinguent également le Viet Nam de nombreuses autres économies en développement. Après 30 ans de réformes politiques et économiques visant à ouvrir l'économie vietnamienne au reste du monde, les réformes du marché vietnamien à la fin des années 1980 ont commencé à entraîner des transformations socio-économiques positives. Cette réforme a entraîné des changements spectaculaires dans l'économie sous tous ses aspects. En particulier, l'économie vietnamienne s'est progressivement réorientée de l'agriculture vers l'industrie et les services, et les exportations internationales continuent de croître. En conséquence, le Vietnam s'est imposé comme l'un des pays les plus dynamiques et à la croissance la plus rapide. Parmi les facteurs déterminants de ce succès, l'investissement direct étranger est considéré comme jouant un rôle crucial. Un pays peut devenir un marché et une destination d'investissement attrayants grâce à diverses réformes juridiques et bureaucratiques, notamment des programmes d'incitation pour les investisseurs étrangers.

Selon le World Investment Report, la Chine a été le plus grand bénéficiaire d'IDE dans les pays asiatiques en développement en 2017. Cependant, la tendance est en train de changer de la Chine vers les pays d'Asie du Sud-Est, notamment le Vietnam. Selon (Lee & Folkmanis, 2013), Samsung, par exemple, déplace ses opérations au Vietnam pour sécuriser même les salaires minimums et protéger les marges bénéficiaires comme la croissance des ventes en raison du faible coût de la main-d'œuvre, l'ouverture au commerce, et une situation géographique avantageuse. Le cas de Samsung montre également que les multinationales évaluent activement et continuellement leurs options en matière d'IDE. Au cours des dernières années, la tendance des multinationales à quitter la Chine ou à diversifier leur production

commence à inquiéter les décideurs politiques au Vietnam. En effet, dans un avenir proche, cette situation pourrait être similaire au Vietnam, car l'augmentation des coûts de la main-d'œuvre peut faire perdre au Vietnam l'une des caractéristiques les plus attrayantes pour les multinationales qui souhaitent maintenir leur production dans le pays.

Dans l'ensemble, le commerce international et les IDE apportent au Vietnam de nombreux avantages tels que la création d'emplois, la formation de la main-d'œuvre, la contribution aux recettes fiscales et l'augmentation des revenus du travail. Les projets d'IDE favorisent également le transfert de technologies vers le Vietnam et génèrent des retombées pour les entreprises locales dans les régions. Mais le côté sombre de tout cela, c'est que la dépendance excessive du Vietnam vis-à-vis des exportations et des IDE a été considérée comme un problème potentiel pour le pays. Selon les données du GSO, alors que les IDE représentent 30% du PIB, ils contribuent à environ 70% du chiffre d'affaires total des exportations. Grâce à leur contribution remarquable aux résultats à l'exportation, les quatre principales filiales de Samsung Vietnam ont également réalisé un revenu total de 63,25 milliards de dollars US et 3,8 milliards de dollars US de bénéfices en 2020, ce qui en fait le plus grand investisseur étranger et l'un des plus gros employeurs du Vietnam. Alors que le rôle des IDE s'accroît dans l'économie, le nombre d'entreprises en faillite et désactivées au Vietnam augmente. Alors que les entreprises d'IDE profitent de la reprise de l'économie et des incitations pour les entreprises d'investissement étranger, les entreprises locales sont complètement éclipsées. L'échec des entreprises locales reflète la faiblesse de la force interne des entreprises nationales. À cet égard, l'effet d'entraînement attendu des IDE est encore limité. Il existe étonnamment peu de travaux sur les effets de la présence des IDE sur la productivité des entreprises nationales au Vietnam.

Depuis le début des années 1990, le Vietnam a mis en œuvre la décentralisation régionale pour améliorer la gestion de l'État et promouvoir la démocratie au niveau infranational. La loi sur l'investissement de 2005 a franchi une étape supplémentaire en établissant un environnement ouvert et équitable pour tous les investisseurs, tout en simplifiant les procédures d'enregistrement des investissements étrangers. En conséquence, le gouvernement central a attribué aux gouvernements locaux une grande autonomie sur leurs économies, notamment en ce qui concerne l'octroi de licences commerciales, l'accès aux terres, l'accès aux services publics et les politiques fiscales telles que les régimes d'imposition et les incitations. Les gouvernements locaux sont également autorisés à approuver les projets d'IDE jusqu'à une certaine limite. On peut dire que la gestion des investissements directs étrangers (IDE) est l'un des secteurs les plus fortement décentralisés. Cependant, la gestion de la décentralisation des IDE au Vietnam présente certaines limites. Bien que le Vietnam ait une attitude positive et

encourageante envers les IDE, la mise en œuvre des politiques d'attraction des IDE est généralement localisée et n'est pas uniforme dans toutes les régions. Les gouvernements locaux pourraient externaliser un impact significatif sur les opérations commerciales des investisseurs étrangers. Bruton & Ahlstrom (2003) ont trouvé des preuves que l'environnement institutionnel crée plusieurs différences significatives entre les régions en Chine, les entreprises étrangères sont confrontées à des défis institutionnels tels que la différence des systèmes juridiques et légaux entre les régions, l'intervention des bureaucrates et des régulateurs, et le problème des pots-de-vin et de la corruption faussant l'application de la loi. Étant donné que le gouvernement central accorde plus de pouvoir d'incitation aux provinces réceptrices d'IDE, l'augmentation des IDE déversés dans un secteur pourrait fournir aux dirigeants de ces provinces des opportunités croissantes et des capacités accrues de recherche de rentes, ce qui entraînerait une prévalence de la corruption. Ce problème a soulevé la question de savoir si les pots-de-vin, la corruption et la distorsion fiscale pouvaient avoir un impact sur les flux d'IDE dans les secteurs, en particulier les secteurs liés aux ressources.

En outre, face à des environnements institutionnels différents, les investisseurs étrangers ont tendance à adapter leurs stratégies à la qualité du gouvernement local ou à cibler le lieu où la qualité du gouvernement local est la plus bénéfique pour leurs opérations commerciales. On s'attend donc à ce que la décentralisation régionale et la qualité du gouvernement local influencent les flux d'IDE au niveau local. La littérature existante n'a cependant pas accordé une attention suffisante à cette question. L'examen des externalités de l'IDE permet non seulement de mieux comprendre les lieux d'implantation de l'IDE, mais aussi d'éclairer les questions plus larges du développement économique qui aident les autorités locales à améliorer la qualité des institutions afin d'attirer des ressources externes pour développer les économies locales.

1.2 Structure et contributions de la thèse

La thèse se compose de trois contributions sur le lien entre les IDE et la performance économique, dont deux traitent des secteurs manufacturiers par des résultats empiriques et la dernière concerne le secteur des ressources naturelles par le modèle théorique.

Chapitre 2: L'investissement direct étranger stimule-t-il la productivité des entreprises nationales? Evidence from Vietnam Manufacturing Firms? (avec le professeur Nguyen-Van Phu)

Comme mentionné ci-dessus, l'un des défis majeurs pour tous les chercheurs dans la littérature existante est l'absence d'une source globale de données au niveau de l'entreprise. Pour

avoir une vision globale de la relation IDE-productivité, nous manquons de résultats empiriques permettant de comparer les différentes régions et pays du monde. Les études précédentes au niveau de l'entreprise d'un seul pays ou de groupes de pays sont limitées par le manque d'ensembles de données de haute qualité, en particulier dans les pays en développement. En utilisant les données de panel de 123 400 entreprises manufacturières de l'enquête sur les entreprises du Vietnam entre 2000 et 2017, nous suggérons que le modèle de différence complète (DID) identifie les impacts de la présence des IDE dans une région sur la productivité totale des facteurs des entreprises nationales. Contrairement à la plupart des études précédentes, nous ne comparons pas seulement la différence d'impact de la présence des IDE sur la productivité des entreprises locales, mais nous rapportons également comment l'effet des IDE est différent entre les entreprises établies avant et après l'entrée des IDE dans une région. En outre, ce chapitre clarifie également le facteur de la taille de l'entreprise, de la propriété étrangère et de la propriété de l'État qui influence les résultats que les entreprises nationales gagnent ou échouent de la présence d'IDE sur leurs marchés nationaux. En analysant deux groupes d'entreprises de longue durée et de jeunes entreprises pour deux périodes (période post et pré-traitement), la méthode DID fournit des estimations plus fiables des effets des IDE que les méthodes traditionnelles telles que l'ajustement par régression en raison de la séparation de l'effet net des IDE sans mélange de l'autre traitement. En outre, nous fournissons également une régression par région pour les zones du nord, du centre et du sud en plus des régressions de référence.

Chapitre 3: Agglomération des IDE, géographie et facteurs provinciaux: Preuve de la productivité provinciale au Vietnam.

Selon l'amendement effectif de la loi sur les IDE en 1996, la politique de décentralisation est mise en œuvre pour fournir plus de pouvoir et d'autonomie dans le traitement des activités d'investissement étranger telles que la délivrance des licences d'investissement, la location des terrains, le recrutement de la main d'œuvre et la délivrance des licences d'exportation et d'importation. Cette politique, d'une part, permet aux autorités provinciales de développer des moyens innovants pour attirer davantage d'investisseurs étrangers, mais d'autre part, elle entraîne des variations dans les caractéristiques de son environnement d'investissement entre les différentes régions. Ainsi, les différentes régions possèdent des caractéristiques uniques qui constituent des sources distinctes d'avantages concurrentiels pour les entreprises étrangères et nationales. Basée sur les données au niveau des entreprises de 63 provinces sur la période 2010 - 2017, une étude au niveau des micro-données permet une analyse plus granulaire des différences régionales et offre des preuves plus précises des déterminants de la localisation tels

que le coût de la main-d'œuvre, la taille du marché, la demande du marché et la qualité de la gouvernance locale qui affectent la productivité provinciale. L'idée initiale est que l'hétérogénéité des entreprises interagit avec les facteurs de localisation et la qualité de la gouvernance locale, façonnant ainsi leur localisation et leurs comportements d'agglomération dans une province. L'objectif de ce chapitre est de mieux comprendre comment les facteurs de localisation et la qualité de la gouvernance locale affectent la productivité provinciale. En outre, l'utilisation du modèle économétrique spatial et de la matrice de pondération de l'emplacement des IDE et de leur voisinage nous aide à étudier comment un emplacement avec un niveau élevé de concentration d'IDE pourrait externaliser ses effets d'agglomération à une région, ainsi que les retombées sur les régions voisines.

Chapitre 4: Vers une explication alternative de la malédiction des ressources naturelles: Pots-de-vin et politique fiscale (avec le professeur Jocelyn Donze)

En examinant de plus près la littérature sur l'IDE, les études précédentes se sont presque exclusivement concentrées sur la question des effets économiques de l'IDE dans les secteurs manufacturiers ; cependant, il existe plusieurs lacunes et insuffisances relatives à la relation entre le secteur des ressources naturelles et les IDE dans la littérature. En ce qui concerne les IDE et le lien avec les ressources naturelles, de nombreuses études se concentrent sur l'explication de la question de la malédiction des ressources naturelles, qui est communément connue comme le phénomène des pays disposant d'abondantes ressources naturelles mais dont les performances économiques sont inférieures à celles des pays pauvres en ressources. Revenant sur la question de la "malédiction des ressources naturelles", le chapitre 4 propose une explication différente de la malédiction des ressources naturelles par un modèle avec corruption et politique fiscale. Il s'agit également de l'une des premières tentatives de fournir une analyse complète du cadre théorique en comparant un modèle de référence (avec une entreprise étrangère représentative) dans lequel l'IDE a lieu uniquement dans le secteur des non-ressources à un modèle complet (avec deux entreprises étrangères représentatives) dans lequel l'IDE a lieu dans les secteurs des non-ressources et des ressources. En plus de fournir une explication alternative à la malédiction des ressources naturelles, ce chapitre analyse également l'interaction entre la corruption et la politique fiscale, conduisant ensuite au changement des IDE et des projets surdimensionnés dans le secteur des ressources naturelles.

Ce chapitre introductif présente la nécessité des questions, les lacunes des études théoriques et empiriques, les motivations ainsi que les contributions de notre travail à la

littérature sur l'investissement direct étranger et le lien avec les ressources naturelles et la performance économique.

1. L'investissement direct étranger stimule-t-il la productivité des entreprises nationales ?
2. Comment l'agglomération des IDE, la géographie et la qualité de la gouvernance locale affectent-elles la productivité provinciale ?
3. La corruption et la politique fiscale sont-elles importantes pour expliquer la malédiction des ressources naturelles ?

CHAPTER 2: DOES FOREIGN DIRECT INVESTMENT BOOST THE PRODUCTIVITY OF DOMESTIC FIRMS? EVIDENCE FROM VIETNAM MANUFACTURING FIRMS ³.

Abstract

Using a panel data of 123,400 manufacturing firms from Vietnam's Enterprise Survey between 2000 and 2017, we suggest that a full difference in difference model (DID) identifies the impacts of FDI presence in a region on the total factor productivity of domestic firms. The results confirm that FDI spillover negatively impacts a firm's productivity in the same region. By considering the firm's size, foreign ownership, and state ownership, our finding confirmed that FDI-related firms, state-owned firms, and large firms are more productive. By analyzing two groups of firms for two periods (post and pre-treatment period), empirical results reveal that firms established before FDI enter a region will have higher productivity than younger ones. Furthermore, we also provide a regional-based regression for the northern, central, and southern zone, and we find that FDI spillover significantly affects the firm's productivity in the northern and southern zone but has no impact on the central zone of Vietnam. The present findings might have important implications for policymakers, foreign investors, and managers.

Keywords: FDI, total factor productivity, causal effects, the difference in difference (DID) method

³ This chapter is written with Prof. Phu Nguyen-Van.

2.1 Introduction

In recent years, foreign direct investment (FDI) has played an essential part in the international economic system called globalization. Nowadays, foreign direct investments are extremely investigated, both at the global and national levels. Many countries worldwide invest significant resources to attract foreign direct investment (FDI) because they believe that FDI is one of the key drivers of economic growth and development, especially in developing ones. Most developing countries realized the potential value of foreign investments, and as a result, they have liberalized their investment regimes and conducted FDI-attracting policies from developed economies (De Mello Jr, 1997). In contrast, FDI may also harm economic development. Because of market failure, when foreign companies enter domestic markets, they have some advantages over domestic firms in terms of technology, knowledge, and opportunities to compete the market share and crowd out local enterprises. Many previous studies show the bad sides of FDI, such as: crowding out effect, negative wage spillovers, profit repatriation, infrastructure development constraint, and environmental issues. (Görg & Greenaway, 2004) also brings us a practical case study about Dutch Disease effects on the Azerbaijan economy.

Although the literature on FDI impacts in developing countries has experienced a large acceleration in the last decades, the conclusion about the effect of FDI is ambiguous. From a macroeconomic perspective, researchers consider FDI as a particular form of capital flows across borders at the national level. Many studies examine the FDI effects on macroeconomic variables such as economic growth (Bruno & Campos, 2013), labor mobility, the business environment, R&D, and knowledge spillover effects. Their works examine issues such as why FDI enters (Blalock & Simon, 2009; Smarzynska Javorcik, 2004; Chung et al., 2003; Konings, 2001), when FDI enters (Saggi, 1998), where FDI enters (Arregle et al., 2009; Lin et al., 2009; Wang & Zhao, 2008), and how FDI enters the host country (Shirodkar & Mohr, 2015). Existing studies often focus on estimating proxies related to “total factor productivity” and “spillover effect” from a micro perspective. FDI generates direct effects on the productivity of firms receiving FDI and indirect effects known as “spillover effects” on domestic firms. In the latter case, the indirect effect can be horizontal (intra-industry effect) or vertical (inter-industry). Although the productivity channel is essential, there is no guarantee that a domestic firm experiencing a positive effect on this channel will necessarily be a net winner from FDI. Schoors & Van Der Tol (2002) found evidence about FDI’s negative effect on local economies due to profit repatriation and “market stealing effect.” Mahutga & Bandelj (2008) showed that FDI brings a positive impact on income inequality. Most previous studies related to industrial

countries such as the United States (Doms & Jensen, 1998), the United Kingdom (Davies & Lyons, 1991), Canada (Globerman et al., 1994), Japan (Kimura & Kiyota, 2007) compare performance or productivity between FDI and local firms within an industry or a region. The authors in this group of studies still argue about the impacts of FDI but they generally consider that FDI have a crucial role in economic growth, especially in developing countries. After boosting labor-intensive exports in low technologies activities as an initial step, some countries broaden the local base and shifted to medium and high technology activities.

Instead of trying to confirm the effect of FDI on some macro-economic variables (e.g., economic growth/development, employment, human capital, poverty...) like previous studies, we investigate the impact of FDI on the productivity of the local economy at the firm level. The analysis bases on the annual Vietnam Enterprise Survey dataset conducted by The Vietnam General Statistics Office (GSO). The extensive survey scope relies on census and covers all establishments, so various and rich information about firm characteristics and financial and employment status are provided. We focus on Vietnam context – a developing country for two main reasons:

First, under the Đổi Mới reform launched in 1987, Vietnam moved from a centrally planned economy to a market economy, which turned one of the poorest countries in the world into a lower middle-income country. Vietnam has emerged among the most dynamic and rapid growth countries in the East Asia region. In the context of deep integration with globalization, Vietnam became a member of the World Trade Organization (WTO) in 2007, bringing dramatic changes to the economy in all aspects, especially in international trade. Among the determinants resulting in this success, Foreign Direct Investment has believed to play a vital role.

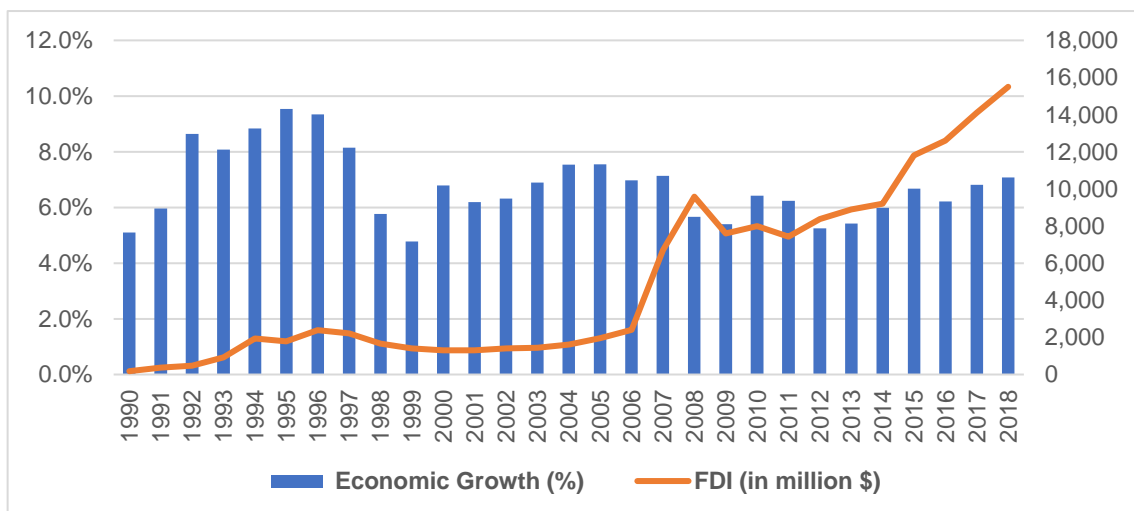


Figure 2.1: Vietnam's net foreign direct investment inflows by percent of GDP and economic growth from 1990-2018.

Data source: World Bank.

As shown in Figure 2.1, Vietnam has experienced a rapid increase in the growth in the FDI and has become one of the most attractive destinations for foreign investment. According to the World Investment Report, China was ranked the largest FDI recipient in 2015. However, the trend is changing from China to Southeast Asian countries, including Vietnam. According to a Bloomberg report in December 2013 (Lee & Folkmanis, 2013), Samsung, for example, is changing their output to Vietnam to secure even minimum wages and protect profit margins as growth in sales due to low labor costs (Chu, 2013), openness to trade, and an advantageous geographic location. Due to the significant amount of FDI, we consider Viet Nam is a good case study to explore FDI impact on domestic firms. Based on data from the GSO, in 2015, nearly 70% of Vietnam's export values were created by enterprises with foreign investment.

In contrast, local businesses are completely overshadowed. While the role of FDI is growing in the economy, the number of bankrupt and inactive enterprises in Vietnam is increasing. FDI enterprises are taking advantage of the economy's recovery, and incentives for foreign investment enterprises or the failure of local businesses reflect domestic firms' weaker internal strength. In this respect, there is surprisingly little work on this issue in Vietnam.

In this study, we highlight three contributions to literature as follow:

First, to the best of our knowledge, the DID method is commonly applied to evaluate the impact of policies but has not been used to examine the effects of FDI presence on the productivity of domestic firms. Using this approach, we calculate the before-after difference in productivity for the treatment group (long-lived firms). In comparing the same group to itself, the first difference can control constant factors over time. Then, to capture time-varying factors, DID took the before-after difference in the control group (young firms), which was exposed to the same environmental conditions as the treatment group. Finally, DID eliminates all time-varying factors from the first difference by subtracting the second difference from it. Thus, it helps us to capture FDI impact – or the difference-in-differences.

Second, previous literature shows that FDI spillover effects are not uniform depending on the absorptive capacity of domestic firms. In this chapter, we try to clarify the factors of foreign ownership, state ownership, and firm size that influence the results that domestic firms gain or lose from the presence of FDI in their domestic markets.

Last, most existing studies face the primary challenge of comparing productivity in various treatment conditions such as FDI, industrial, and regional factors. Significantly, the FDI-productivity nexus is also influenced by the firm's internal factors such as foreign ownership, state ownership, and firm size, which were found by the DID method in this study.

Consequently, differences in productivity may be due to either the FDI treatment under consideration or the differences in the existence of the other treatments. DID methods may provide more reliable estimates of FDI effects than traditional methods such as regression adjustment.

This study is organized as follows. The theoretical background and related literature review of our empirical model are provided in Section 2.2. Section 2.3, 2.4 presents the data, empirical model, and variables used in the regression analysis, while section 2.5 discusses the estimation results and robustness checks. Section 2.6 concludes with a discussion of the policy consequences and theoretical relevance of the findings.

2.2 Related literature and our research hypotheses

2.2.1 Related literature

In literature, two primary schools focusing on determinants that impact firm performances are industrial organization (IO) economists and strategic management researchers.

Based on IO perspectives, I/O researchers stated that several aspects impact the firm's performance. They assumed that "market or industry structures determined member firms' conduct and performance." The influence of the industry environment is the primary factor for gaining a competitive advantage. The traditional I/O perspective provided strategic management a systematic model for valuing external competition within an industry. The central principle of IO theory views that what an organization must do to survive and grow is adapting to changing circumstances in its sector, and the success of the industry in which it competes primarily determines the firm's performance (Barthwal, 2007; Corley, 1990; Ferguson & Ferguson, 1994; Grether, 1970). Following this theory, a firm would choose the correct industry to compete in rather than determine how to compete within a given industry. The empirical studies also support and show evidence that industry factors primarily determine a firm's performance. IO states that firms' performance depends on their ability to adapt to industry forces. Given the importance of market structure and industry factors (Schmalensee, 1985), competencies, resources, strategies, and strengths are assumed to be similar to competitors within an industry. If a firm develops a new, successful strategy, other firms will rapidly imitate by purchasing the resources, competencies that have made the leading firm so profitable. Although the IO theories focus on the impact of industry on individual firms, in some cases, firms are also able to influence the rival's strategy and even modify the market structure.

On the other side, competitive advantage is the most widely used term in strategic management research, and they view it as the basis for superior performance. The resourcebased theory emphasizes the possession of specific resources that explain the variances in firm performance due to the characteristics of unique, valuable, difficult-to-replicate firm resources and capabilities (Henderson & Mitchell, 1997; Barney, 1991; Rumelt, 1991; Roquebert et al., 1996; Fahy, 2000). Environmental dynamism, competitors, and technologies resulting in uncertainty allow firms to flexibly adjust strategies to deal with marketplace changes by structuring and coordinating intra- and inter-firm resources. A contingency theory argued that there is no best way for the managerial outcome, organizational structure, leadership (Shepard & Houglan Jr, 1978). Instead, the optimal course of action is that contingent leaders are flexible in developing the diversification strategy, and they can use its internal coordination mechanisms as a valuable resource and adapt with environmental preferences to attain competitive advantages (Duncan, 1972; Miles et al., 1978; Venkatraman, 1989).

Although there are differences between the two primary schools about explaining a firm's performance difference, both perspectives agree on the importance of externalities such as industrial and regional factors. In this study, we introduce FDI presence as a new environmental factor in the Vietnam economy, affecting indigenous firms through the area where the firms are located.

2.2.2 Empirical studies

2.2.2.1 The productivity of FDI related firms vs. the productivity of domestic firms

Dunning's eclectic paradigm (Dunning & McQueen, 1981; Dunning, 1988) refers to firm-specific advantages such as ownership, internalization, and location advantages to explain the presence and development of multinational corporations (MNCs). The ownership-location-internalization (OLI) model states that all three conditions must be satisfied for potential investing firms to find FDI. Before entering a foreign country, FDI-related firms possess specific advantages. According to (Dunning, 1973, 1980, 1988), there are several advantages:

- (i) Ownership Advantages including three kinds of specific advantages: (i) monopoly advantages as privileged market access through natural resources, copyrights, trademarks; (ii) technology and knowledge; (iii) Scale of economy, learning, scope, better access to financial capital.
- (ii) Location Advantages include the cost of transport, telecommunications, market size, political advantages, and social advantages.

- (iii) Internalization advantages: when the first two conditions are met, companies can use these advantages in coordination with at least some factors outside their original country.

Based on the OLI paradigm, empirical studies proved that FDI-related firms might be more efficient than local firms when operating in the host country. The evidence from (C. Wang et al., 2002) reported that ownership advantages of FDI-related firms led to higher performance than domestic firms, for example (Doms & Jensen, 1998) for the United States, (Criscuolo & Leaver, 2005) for the United Kingdom, (Bushnell & Wolfram, 2009), (Pfaffermayr & Bellak, 2002) for Austria. Most studies found evidence that the productivity of FDI-related firms is higher productivity than local firms (Haskel et al., 2007; Konings, 2001; Schoors & van der Tol, 2001; Tomiura, 2007). Those studies also showed the competitive advantages of FDI related firms which can be listed as follows:

Management expertise and efficiency: By diversifying their business in different markets, MNEs experience more valuable management expertise than domestic firms (Hymer, 1976). Most of the existing studies (Gershenberg, 1987; Li, 1998; Conyon et al., 2002; Lipsey & Sjöholm, 2004; Feliciano & Lipsey, 2006; McGuinness et al., 2010; Peluffo, 2015) reported that economic scale helps foreign firms easy to crowd out domestic firms through labor market competition for the best talent and skilled workers by wage and effective reward system (Li, 1998).

Technology and product leadership: In literature, Saggi (2002) reported that local firms are less concerned about technological innovation because it's too costly to develop new technologies (Y. Wang & Wang, 1997). In contrast, due to capital intensity, most foreign firms spend a lot in R&D developments to possess the most advanced technologies in the industry to produce better products and the newest products, thus leading to higher firm revenues. (Cantwell, 1989).

Marketing expertise: One of the most effective strategies of FDI-related firms is to create a competitive advantage is spending more on marketing and advertising. Taking advantage of operating in diversified markets and doing business with various customers, foreign firms can expand their knowledge and accumulate new ideas from various events and activities to enhance marketing capabilities (Barkema & Vermeulen, 1998). In addition, MNEs can apply global branding to marketing a product or service under the same name in different countries with the same brand vision. In that way, international branding recognition is the strategy that significantly enhances efficiency and reduces promotional costs.

Economies of scale: In most cases, foreign firm's size is much larger than those of local firms (Caves, 1971). Foreign firms' competitiveness is derived from capital-intensive technology, which is one of the key factors to boost productivity (Koirala & Koshal, 1999), especially in industries where high entry barriers exist to limit newcomers. By taking advantage of advanced technology, economies of scale, easy access to financial sources of funds, they compete with local firms, especially “crowding out” small-sized firms. Moreover, all critical factors of MNEs' inputs, such as intermediate goods, physical capital, R&D, and marketing, can be shared among subsidiaries to take advantage of global synergies (Agosin & Mayer, 2000).

H_1 : FDI – related firms perform better than domestic firms.

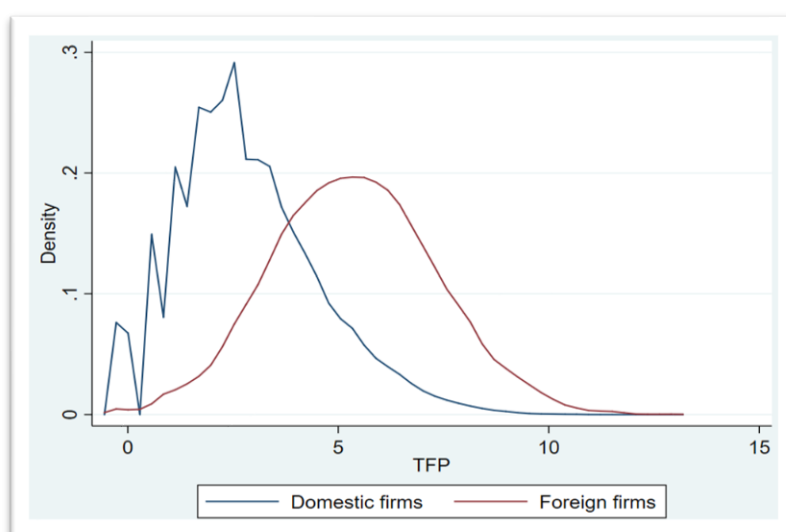


Figure 2.2: Kernel density estimate of TFP

2.2.2.2 The impact of FDI on the productivity of the domestic firm

The total impact of FDI on a firm’s productivity is divided into two types: direct effects and indirect effects. The direct effect of FDI-inflow refers to its effects on firms' productivity receiving foreign investment, while the indirect effect refers to the impact of FDI presence on the productivity of local firms or spillovers produced from FDI-related firms to domestic firms. Spillover effects are commonly known as transferring knowledge and technology from an FDI-related firm to indigenous firms. Kinoshita (1998) classified FDI spillover effects into four categories: the training effect, the demonstration effect, the competition effect, the foreign linkage effect.

- (i) *Horizontal linkage* (from MNEs to domestic firms in the same industry): Foreign firms have competitive advantages in higher technology and productivity that reduce marginal costs, creating a “crowding-out effect” to local competitors.

Besides, because of the “competition effect,” local firms also lose the best talent and skilled labor to foreign firms due to higher wages. Because of the difference in technology, the demonstration effect produced from FDI presence can positively or negatively impact local firms. When FDI enters into an industry, indigenous firms can adopt similar advanced technologies, imitate modern management skills, and be more productive. In contrast, to maintain their market position, FDI-related firms prevent the leak of their technology and knowledge; they conduct the strategy leading to fierce price competition and innovative products.

- (ii) *Backward linkages* (from foreign firms to local suppliers): FDI-related firms sourcing locally can raise the domestic supplier’s demand. Because their higher standard of intermediate input required indigenous firms to enhance their productivity and quality of the product, foreign buyers also provide training and technology to local suppliers to cope with their high-quality standard of input. Moreover, FDI presence also creates a competition effect between local suppliers.
- (iii) *Forward linkages* (from foreign suppliers to local firms): Indigenous firms may benefit from using better intermediate input from FDI-related firms. Moreover, they can learn about management practices and operating processes from foreign firms through demonstration effects.

The effects of FDI spillovers are confirmed in several empirical studies. One question raised is that whether FDI spillover – firm’s productivity nexus varies by firm age. Concerning the impact of age, the theory is controversial. One branch of studies reported that long-lived firms with more experience could benefit from learning, are eligible for capital to improve their technology, and leads to better performance (Stinchcombe, 1965). Studies in this stream suggest that long-lived firms are more productive than younger ones.

In contrast, another branch of the study stated that younger firms are more productive than older firms. They explained that younger firms are mobile and flexible to the change of market and circumstances. They tend to gain a head start to take a shortcut by advantage of the latter entrance (Marshall, 1949). Few studies investigate the FDI spillovers on productivity to the best of our knowledge, but that clarifies the difference of this effect by firm age. The study of (Zhou et al., 2002) is one of the few studies that addressed these issues that explore FDI impact on a firm’s productivity and consider the difference in FDI spillover vary by the history of FDI enter into industries or regions. They found that indigenous firms locating in industries with a longer history of FDI tend to experience lower productivity, but local firms entering areas with a long history of FDI tend to have higher productivity. Another study by Brussevich

& Tan (2019) confirmed that FDI spillover is different for small and medium firms and large firms. In detail, they found the negative horizontal effect regarding TFP for small firms but found no evidence from large firms. Whereas backward spillover is only positively associated with small and medium firms.

This study divides the full sample into two periods: before and after FDI enters an industry or a region. Our goal is to capture the FDI presence effect on a firm's productivity and investigate the difference in FDI spillover effect vary by two groups called long-lived firms and younger firms.

2.2.2.3 The impact of FDI on the productivity of domestic firms in the same region

The entry of FDI in a region can bring management expertise and advanced skills that generate positive spillover to indigenous firms. While domestic firms compete directly with FDI-related firms in the same industry have to improve their productivity to survive in the competitive market, those who do not compete directly with foreign firms can benefit from FDI presence (Sgard, 2001). First, local firms can imitate the role model of successful FDI enterprises in this region to improve their management and marketing skills. Second, foreign firms can raise the local supplier demand by sourcing their intermediate input. To meet the high-quality standard of FDI-related firms, regional firms can access foreign firms' advanced training and technology and improve their productivity (Lutz et al., 2008).

In contrast, if domestic firms source better quality of intermediate input from FDI firms. They also can improve their quality of products and learn new management practices and operating processes from FDI-related firms through demonstration effects. Moreover, FDI – attracting policies in a region may change the institutional quality and improve the legal system. As a result, domestic firms can enjoy a better business environment in a region with a long history of FDI presence. All these explanations support the idea that the impact of FDI presence on a firm's productivity in the same region is positive (Xu & Sheng, 2012; Zhang, 2017). Thus, we hypothesize:

H_{2a}: FDI presence generates a positive effect on the productivity of domestic firms in the same region.

H_{2b}: Domestic firms located in a region with a long history of FDI tend to have higher productivity.

2.3 Data and variables

2.3.1 Data

Our study uses a Vietnamese firm-level dataset from an annual Vietnam enterprise survey conducted by the General Statistics Office (GSO). The survey relies on a census and covers all establishments for the period 2010–2017. This dataset provides intensive information on financial and employment status. There are 63 provinces and 123,400 firms with 432,795 observations in the sample over the period. For each firm's observation, the dataset includes firm identification, tax code, date of establishment, ownership structure, types of business structures, industry code, number of employees, financial reports, province. Our sample consists of two sub-sample: 101,903 firms established before FDI enters a region (*called a long-lived firm*) and 21,497 ones set up after FDI enters a region (*called a young firm*) during the period 2010 – 2017.

The manufacturing industry comprises 24 sub-industries classified by the Vietnam Standard Industrial Classification (VSCI) two digits level. Besides, the firm-level dataset in this study is also collected from various resources: the Foreign Investment Agency, Ministry of Planning and Investment, IMF, and WB.

2.3.2 Variables

2.3.2.1 Dependent variable

The first step in our analysis requires that we estimate productivity for each firm in our sample. The concept of “total factor productivity (TFP)” has been broadly examined in the economics literature about economic growth and efficiency. First, we use the approach and methodology following the standard lines well developed and applied by many previous authors.

TFP levels are estimated by using Cobb-Douglas functions from which to compare the productivity differences. Akerberg et al. (2015) developed the methodology; henceforth, ACF emphasizes that the restrictiveness of assuming that labor is perfectly flexible in the (Levinsohn & Petrin, 2003) approach can result in the collinearity problem in the input choices of the (Levinsohn & Petrin, 2003) method. As both variable inputs, i.e., labor and materials, are chosen simultaneously and depend on the same state variables (capital and labor), it is impossible to identify the capital coefficient and labor in the first stage. In contrast to (Levinsohn & Petrin, 2003) and (Olley & Pakes, 1992), the authors suggest an extension of the LP approach, which estimates the labor coefficient in the second stage to surpass the potential collinearity problem, particularly important in the context of FDI. However, compared to the other approaches, the ACF is one of the most popular approaches in the literature as compared

to (Olley & Pakes, 1992) and Wooldridge (2009), as no extensions or alternatives are emerging as superior in all cases. Referring to the literature on different TFP estimations, we implement the structural techniques suggested by ACF to obtain estimates of firm TFP.

2.3.2.2 Independent variables

Firm size (SMEs): Traditionally, there are several criteria for carrying out this classification of companies. In this regard, Decree 39/2018/NĐ-CP classified business by size as small, medium, and large size. Decree 39/2018/NĐ-CP points out that companies with fewer than 200 workers and total assets below 100 billion VND can be categorized as small and medium enterprises (SMEs). Large businesses, meanwhile, are those that exceed these parameters. Firm size is included here as a factor that affects firm productivity.

State Ownership (STATE): In literature, SOEs' performances are often compared with performances of private firms in previous studies. Many explanations are provided to explain the difference in productivity and innovation outcomes between SOEs and privately-owned firms. According to (Shepherd, 1972), because of protectionism, the government offers to favor policies and creates an unfair playing field for state-owned firms. SOEs often operate in less competitive industries or monopolies. Conversely, privately firms tend to operate in more competitive industries, which forces them to make more effective R&D investments to survive and grow. In addition, SOEs' performance is evaluated by the government goal. Although SOEs cannot perform as well as private firms, the government does not shut them down but finance the funds from the government budget to help them stay in the industry. Whereas private firms cannot receive any government funds, they have to compete in many aspects to secure a market share or be crowded out of the industry.

Foreign Ownership (FDI): In Law on Enterprises 2014 of Vietnam, this study divides all enterprises into 14 groups by type of ownership. Following the Law on Investment of Vietnam, FDI-related firms are classified into two groups explaining performance variations: 100% foreign-invested company and Joint Venture Company. According to the Vietnamese state law, a Joint Venture Company ("JVC") can be incorporated as a joint-stock company or a limited liability company by at least one Vietnamese investor and one foreign investor (either individual or legal entity). Besides, foreign investors can establish their wholly-owned companies in Vietnam but not in all business sectors. A wholly foreign-invested company ("LLC") can be formed with a single-member LLC (if there is only one investor), a multi-member LLC, or a joint-stock company (if there are two or more investors).

Industry concentration indicates the degree of competition in the industry (Caves & Porter, 1977). We used the Herfindahl index (H-index) to measure the distribution of entire

industry market share information to overview industry concentration. A low degree of the Herfindahl index implies that the market is shared by many competitors, while a highly concentrated industry means that a few players share the industry with a large percentage of market share.

Industry investment intensity refers to industries that require large amounts of investment to produce a good or service. High investment intensity industry means that the sector requires large-scale investment, then newcomers who consider entering this industry need to invest a high percentage of fixed assets, such as property, plant, and equipment (PP&E), before they can generate any profits. This point will create a barrier and increase the risk for firms to enter this industry. Thus, firms in an industry with a lower level of competition and may have low productivity (Yip, 1982).

Table 2.1: Variable definitions and expected results

Variables	Type	Description and measurement	Expected sign
TFP	Continuous	Total factor productivity estimated by (Akerberg et al., 2015)	
SME	Dummy	Identifying whether or not a firm is SMEs SME=1 if it is SME and SME=0 if it is a large enterprise.	+
FDI	Dummy	Identifying whether or not a firm is FDI-related FDI=1 if it is an FDI-related firm and FDI=0 if it is a local firm.	+
SOE	Dummy	Identifying whether or not a firm is SOEs. SOE=1 if a firm is a SOE and SOE=0 if it is a non SOE.	+/-
D_before	Dummy	D_before dummy variable takes the value of 1 if a firm establishes before FDI enters a region, and 0 otherwise.	+/-

Industry concentration (H-index)	Continuous	<p>Herfindahl index (H-index) is used to measure an industry's concentration. The larger an industry's H-index, the more concentrated the industry. H-index is defined as:</p> $H - index_{jt} = \sum_{i=1}^n \left(\frac{revenue_{ijt}}{revenue_{jt}} \right)^2$ <p>Where $revenue_{ijt}$ is the revenue of the i^{th} firm in industry j at time t. $Revenue_{jt}$ is the total revenue of industry j at time t.</p>	+/-
Industry investment intensity (in thousand billion VND)	Continuous	This variable measures the average fixed capital investment of an industry.	+/-
Contribution of FDI in a region (percentage)	Continuous	The total revenue of FDI firms in a province contributes to the total revenues of all firms in the same province.	-
D_before * Contribution of FDI in a region	Continuous	Interaction term to examine whether FDI presence impacts a firm that establishes before FDI enters a province.	+

Table 2.2: Summary statistics

Variable	Mean	Std. Dev.	Min	Max
TFP	3.148	1.875	-0.431	13.067
FDI	0.109	0.312	0	1
SOE	0.013	0.115	0	1
SME	0.896	0.305	0	1
D_before	0.270	0.444	0	1
Contribution of FDI in a region	0.424	0.209	0	0.941
Industry concentration (H-index)	0.023	0.052	0.003	0.852
Industry investment intensity	0.411	5.041	-0.336	66.569

Notes: Data source: calculated by the authors using Vietnam Enterprises Database 2010 - 2017. Number of observations is 432,795.

2.4 Methodology

To investigate the causal effect of FDI and domestic firms' productivity, we employ a Difference in Difference (DID) method (Zhang & Guo, 2019; Gustafsson et al., 2016; Debaere et al., 2010; Heyman et al., 2007; Greenaway et al., 2005) to test the proposed hypotheses. Using this approach, we can differentiate causality from pure statistical relationships, given that a rational regime supports the relationship between target variables and FDI presence. DID method can control for effects due to the general time trend, industrial and regional differences. According to the principle of this approach, we define group of firms established before FDI enter in a province (long-lived firms) as treatment group and group of firms established after FDI enter in a province (young firms) as control group, then we compare the difference in FDI presence impact on the firms' productivity in various regions.

Most existing studies face the problem of comparing productivity in the context of multiple treatments. Each firm has heterogeneity. Thus, the causality between the FDI spillover effect and the firm's productivity is influenced by both firm's internal factors and environmental factors. Our goal is to explore how a firm's productivity responds to FDI presence while controlling other factors. In the regression analysis, we estimate an equation with a firm's productivity as a dependent variable, and the dummy variable coefficient (D_before) used to capture the FDI presence effect. By adopting the DID approach to investigate the difference between the productivity of domestic firms at two time periods: before and after FDI enter a region, we use the following specification:

$$TFP_{it} = \beta_0 + \beta_1 D_{before_{it}} + \beta_2 REF_{it} + \beta_3 (D_{before_{it}} \times REF_{it}) + \lambda_t + \varepsilon_{it} \quad (1)$$

Where i represents different firms; t represents time variables; TFP_{it} represents firm's productivity; D_{before} is a dummy variable reflecting treatment and control groups:

$D_{before} = 1$ refers to firms established before FDI enter a region, otherwise, $D_{before} = 0$. $REFDI_{jt}$ captures FDI spillover effect in a $region_j$ at year t , and ε_{it} is an error term. We observe λ_t handled with year dummies. Table 2.3 illustrate how to measure DID value (FDI effect).

We know that the dependent variable (TFP) can be affected by other factors besides FDI presence. Therefore, it could be necessary to include additional explanations for a set of control variables such as time-invariant variables (FDI, SME, SOE) and industrial factors. Our model is constructed as follows:

$$TFP_{it} = \beta_0 + \beta_1 D_{before_{it}} + \beta_2 REF_{DI}_{it} + \beta_3 (D_{before_{it}} \times REF_{DI}_{it}) + \sum \alpha_k Z_{it} + \lambda_t + \varepsilon_{it} \quad (2)$$

To make a classical difference in the differences model, we need to have all four combinations of treated and untreated crossed with pre-and post-treatment, which are displayed by estimated coefficients in Table 2.3. As shown in Table 2.3, β_0 is the mean TFP for the control group (young firms) before receiving the FDI effect. $\beta_0 + \beta_1$ is the mean TFP for the treatment group (long-lived firms) before receiving FDI effect; $(\beta_2 + \beta_3)REF_{DI}$ is the single difference of treatment group between the pre-post treatment; $\beta_2 REF_{DI}$ is the single difference of control group between the pre-post treatment; $\beta_0 + \beta_2 REF_{DI}$ is the mean TFP for the control group (young firms) after receiving the FDI-effect; β_1 is the TFP difference between long-lived firms and young firms before receiving the FDI – effect; $\beta_1 + \beta_3 REF_{DI}$ is the TFP difference between long-lived firms and young firms after receiving FDI-effect; $\beta_3 REF_{DI}$ is the DID or FDI spillover effect.

Using panel dataset, we applied the estimation methods traditionally used are the fixed-effect model (FEM) and random effects model (REM). We apply F-test⁴, Hausman test⁵ to determine which is more appropriate for our study. The F-test and Hausman test results suggest that the FEM is favored over OLS and REM; we implement the empirical analysis with a panel FE model.

⁴ Our F-test statistic exceeds the corresponding critical value at the 1% level, suggesting that we reject the pooled OLS approach in favor of the panel regression with the firm-fixed effects (FE) approach.

⁵ Hausman test suggests that the firm fixed-effect model is favored over the random-effect model, we implement the empirical analysis with a panel FEM.

Table 2.3: Meaning of each parameter in the DID model

Status	Before receiving FDI effects	After receiving FDI effects	Difference
Treatment group (long-lived firms), D_before =1	$\beta_0 + \beta_1$	$\beta_0 + \beta_1 + (\beta_2 + \beta_3)REFDI$	$\Delta TFP_t = (\beta_2 + \beta_3)REFDI$
Control group (young firms), D_before=0	β_0	$\beta_0 + \beta_2 REFDI$	$\Delta TFP_0 = \beta_2 REFDI$
Difference-in-difference (DID)	β_1	$\beta_1 + \beta_3 REFDI$	$\Delta \Delta TFP = \beta_3 REFDI$

In our sample, 432,795 “firm-panel” observations were grouped as unbalanced panel data, among which 390,603 were labeled as the treatment group and 42,192 as the control group. Table 2.4 displays the classification of firms in our sample by state-owned ownership, foreign ownership, and firm size. The results of the correlation coefficient and multicollinearity test are shown in Table 2.6.

Table 2.4: Firm’s classification by firm size, foreign ownership, and state ownership

	Before receiving FDI effects	After receiving FDI effects	Number of observations
SOEs	5,507	301	5,808
SMEs	347,440	40,326	387,766
FDI-related firms	45,079	2,187	47,266

Data source: calculated by the authors using Vietnam Enterprises Database 2010-2017.

2.5 Results

2.5.1 Benchmark regression

In this section, we systematically investigate the causal effect between FDI presence and the firm's productivity. We carry out the DID estimation of Equation (1) with and (2) without the control variables. As shown in Table 2.5, we have evidence about the causal relationship between FDI presence and the firm's productivity within a region. But this causal effect is contrary between long-lived firms and younger ones whether in the same area. In detail, FDI will generate positive effects on long-lived firms. When a new business plans to start up or operates, they have to survey the business environment and potential return of an industry or region. Typically, start-up owners also want to find out the area with a high development level (e.g., better transportations, telecommunications, complementary services) to benefit from available conditions and incentives of the local governance quality. This point is also true with foreign investors called "good land birds." That can be explained about the positive impact of FDI contribution firms in the same region.

By using the interaction term between dummy variables D_before and the contribution of FDI in the region, the coefficients are significant and positive. These findings also proved that the more FDI enters an area will enhance the productivity of long-lived firms. The result of Column (2) shows that after we added the control variables in our model, the coefficients of the interaction term ($D_before \times$ Contribution of FDI in a region) were still significantly positive. Although the values of the coefficients were changed, the result was robust. We have the evidence to reject H_{2a} and support H_{2b} hypotheses at a 1% level.

Table 2.5: Comparing estimation results of a causal effect between FDI presence and firm's productivity by DID with and without control variables

	DID without control variables (1)	DID with control variable (2)
	Coefficient (.Std err)	Coefficient (.Std err)
D_before	-0.022 (0.019)	0.093*** (0.018)
Contribution of FDI in a region	-0.475*** (0.050)	-0.239*** (0.048)
D_before x Contribution of FDI in a region	0.173*** (0.044)	0.112*** (0.042)
SME		-1.099*** (0.016)
SOE		0.239*** (0.039)
FDI		0.293*** (0.055)
Industry concentration (H-index)		0.136*** (0.048)
Industry investment intensity		0.00004 (0.0003)
<i>Year effects</i>		
2011		-0.057*** (0.004)
2012		-0.140*** (0.005)
2013		-0.221*** (0.005)
2014		-0.259*** (0.006)
2015		-0.271*** (0.006)
2016		-0.244*** (0.006)
2017		-0.305*** (0.007)
Intercept	3.323*** (0.021)	4.268*** (0.026)
Number of observations	430,461	430,461

Notes: * Significant at the 10% level. ** Significant at the 5% level. *** Significant at the 1% level.

Data source: calculated by the authors using Vietnam Enterprises Database 2010-2017.

To assess and compare the difference in the impact of FDI on the firm's productivity by foreign firms, state ownership, and firm size, we use FDI, SME, SOE dummies.

First, FDI is a dummy variable taking a value 1 if foreign ownership is present and 0 if no foreign ownership is current. We first notice that the coefficient of the FDI dummy variable is found to have a positive and significant effect on firm productivity at a 1% level. Thus, we have the evidence to support the H_1 hypothesis that FDI-related firms are more efficient than their indigenous firms when operating in the host country. Our result is consistent with (Cantwell, 1989; Simonin, 1999; C. Wang et al., 2002; Pfaffermayr & Bellak, 2002; Saggi, 2002; Criscuolo & Leaver, 2005).

Second, SOEs' productivity is often compared to productivity with private firms. As expected, our new finding confirmed that SOEs were more productive than private firms. The explanation can be that the large-scale financial incentives from the government budget allow SOEs to invest in key sectors or industries that require the intensity of technology and capital. Besides, they have many preferential policies in land and tax incentives that will prevent private enterprises from entering the industry. SOEs are typically monopolies and have incentives from the government to protect the key sectors and large projects. SOEs' productivity is evaluated against state goals and resources according to political ration instead of market efficiency. Whereas private firms cannot receive any government funds, they have to compete in many aspects to secure market share and survive in the industry.

Third, the coefficient of the SMEs dummy showed that SMEs' productivity is significantly lower than that of large-sized firms. This point is consistent with what has been found in (McGovern & Hicks, 2004; Eurostat, 2009) that SMEs tend to have lower productivity than large firms. Possible explanations for our findings are: (i) SME financing constraints prevent them from investing in improving productivity, such as intangible investment (Cressy, 2012); (ii) larger firms can benefit from economies of scale, typically productivity increases with firm size. It creates a persistent productivity variance between SMEs and large firms.

Industrial factors

We used the Herfindahl index (H-index) to measure the distribution of entire industry market share information to overview industry concentration. A highly concentrated industry means that a few players share the industry with a large market share. A positive coefficient of the H-index indicates that an increase in industry concentration leads to an enhancement in the firm's productivity. This finding is supported by the oligopoly theory that the fewer the firms and the more unequal the distribution of market shares leads to less competition and higher productivity because firms tend to cooperate (Yip, 1982).

2.5.2 Region-Based Discussion

Table 2.6 provides the regional comparison of FDI spillover effects across provinces in Vietnam's Northern, Central, and Southern zone. The long-lived firms in the Central and Southern zones are more productive than young firms. Our findings show that the FDI presence in the Northern zone externalizes negatively to long-lived firms. Moreover, the coefficients of the interaction term $D_before \times FDI$ contribution in the region in Columns (3), (5) are significant at a 1% level. These findings confirmed that the long-lived firm's productivity of the Northern and Southern regions was $0.25*REFDI_t$ higher and $0.15*REFDI_t$ lower than those in the younger firms, respectively. While FDI presence generates no impact to firms operating in the Central and Southern Zone, the Northern zone received adverse spillover effects.

Moreover, we found the contrast result of the FDI spillover effects on productivity with long-lived firms in Northern and Southern, while there is no evidence about the impact of FDI on firms' productivity in the Central zone. This contrast is correct in the case of the regional distribution of FDI in Vietnam. Two explanations could be discussed: (1) regional policies may not be well designed; (2) there may be a contradiction or competition between different regions. The descriptive statistic also shows that the Northern and Southern Zone attract more FDI projects than the Central zone. The coefficients of FDI, SME, and SOE are still significant at a 1% level, and the sign is the same with benchmark regression. FDI-related firms are more productive than local firms, SMEs are less productive than large firms, and SOEs are more productive than private firms.

Table 2.6: Regression results with DID method for Southern, Central, and Northern Vietnam

	Northern zone (3)	Central zone (4)	Southern zone (5)
	Coefficient (.Std err)	Coefficient (.Std err)	Coefficient (.Std err)
D_before	-0.007 (0.039)	0.099** (0.045)	0.192*** (0.032)
Contribution of FDI in a region	-0.369*** (0.073)	-0.087 (0.138)	0.033 (0.091)
Dbefore x Contribution of FDI in a region	0.253*** (0.064)	0.090 (0.150)	-0.151* (0.086)
FDI	0.259*** (0.084)	0.089 (0.121)	0.344*** (0.079)
SME	-1.095*** (0.026)	-1.073*** (0.046)	-1.103*** (0.023)
SOE	0.242*** (0.053)	0.095 (0.078)	0.326*** (0.077)
Industry concentration (H-index)	-0.115 (0.077)	0.031 (0.149)	-0.115 (0.077)
Industry investment intensity	-0.001** (0.001)	0.003*** (0.001)	-0.001** (0.001)
Year effects			
2011	-0.057*** (0.008)	-0.078*** (0.011)	-0.053*** (0.006)
2012	-0.169*** (0.009)	-0.180*** (0.013)	-0.111*** (0.007)
2013	-0.228*** (0.009)	-0.260*** (0.014)	-0.208*** (0.008)
2014	-0.267*** (0.010)	-0.330*** (0.015)	-0.238*** (0.008)
2015	-0.306*** (0.010)	-0.338*** (0.016)	-0.231*** (0.008)
2016	-0.261*** (0.011)	-0.332*** (0.016)	-0.213*** (0.009)
2017	-0.315*** (0.012)	-0.431*** (0.018)	-0.271*** (0.009)
Intercept	4.429*** (0.048)	4.269*** (0.057)	4.103*** (0.042)
Number of observations	154,978	54,891	220,592

Notes: * Significant at the 10% level. ** Significant at the 5% level. *** Significant at the 1% level.

Data source: calculated by the authors using Vietnam Enterprises Database 2010-2017.

2.6 Conclusion

This study contributes to the existing literature about the relationship between a firm's productivity and the FDI spillover effect. Our findings report that a firm's productivity is influenced by internal factors such as foreign ownership, state ownership, and firm size and external factors such as unexpected change markets (industrial factors) and business environment (regional factors). In this study, we emphasize the role of FDI presence in a region as an environmental factor that affects the firm's productivity because environmental dynamism leading to uncertainty makes firms adjust strategies to adapt swiftly to the changing marketplace.

The difference in difference (DID) method is applied to evaluate FDI - spillover effects on the firm's productivity; we use this method to eliminate biases due to industrial and regional differences and nationwide trends. The findings confirmed the negative impact of FDI contribution in the region. Domestic firms operating in the areas that attract more FDI tend to experience lower productivity. Moreover, our study provides empirical evidence that the productivity of SOEs, SMEs, and FDI-related firms reacts differently with FDI presence in a region. In detail, FDI-related firms, SOEs, and larger firms are more productive.

One of the biggest challenges of analyzing FDI effects is that it's challenging to differentiate TFP caused by FDI impact or other treatment effects. The DID method supports us to provide precise empirical results on the net FDI effect by comparing two groups: firms established before and FDI enters into regions. By comparing FDI effects between the treatment and control groups, we measure the net FDI effects and prove that the more FDI enters an area will increase the productivity of long-lived firms. To the best of our knowledge, this study is one of the first attempts concentrating on the net effect of FDI presence on a firm's productivity.

Besides the benchmark regression, we also contribute to the literature of FDI in Vietnam by providing the region-based regression that allows us to compare FDI spillover effects across provinces in the Northern, Central, and Southern zone of Vietnam. The contrast result of the FDI spillover effects on productivity with long-lived firms in Northern and Southern also accurately reflects the regional distribution of FDI in Vietnam.

From the government's perspective, we provided a rigorous reference for relevant policymakers to maximize the positive impact of FDI presence by considering the current situation of manufacturing firms across provinces in Vietnam. It is also of specific guiding significance to the development of a business environment in Vietnam. Understanding the positive and negative for FDI presence helps government and governmental agencies evaluate

the efficiency of FDI-attracting policy and provides a better strategy to young firms for establishment when they intend to locate in a particular region.

Appendix

Table 2.7: Correlation coefficients between independent variables

No.	Variable	1	2	3	4	5	6	7
1	D_before	1						
2	Contribution of FDI in a region	0.098	1					
3	FDI	0.060	0.273	1				
4	SME	-0.065	-0.100	-0.369	1			
5	SOE	0.018	-0.042	-0.041	-0.158	1		
6	Industry concentration (H-index)	-0.016	0.037	0.073	-0.031	0.033	1	
7	Industry investment intensity	0.015	0.012	0.022	-0.006	-0.004	-0.003	1

Data source: calculated by the authors using Vietnam Enterprises Database 2010 – 2017.

Table 2.8: Regression results with fixed effect model (FEM) and random effect model (REM)

	FEM (1)	REM (2)
	Coefficient	Coefficient
	(.Std err)	(.Std err)
D_before	0.093*** (0.018)	0.311*** (0.015)
Contribution of FDI in a region	-0.239*** (0.048)	0.097*** (0.035)
Dbefore x Contribution of FDI in a region	0.112*** (0.042)	0.059* (0.035)
FDI	0.293*** (0.055)	1.661*** (0.020)
SME	-1.099*** (0.016)	-1.815*** (0.016)
SOE	0.239*** (0.039)	1.301*** (0.041)
Industry concentration (H-index)	0.136*** (0.048)	-0.134*** (0.041)
Industry investment intensity	0.000 (0.000)	0.000 (0.000)
Year effects		
2011.year	-0.057*** (0.004)	-0.049*** (0.004)
2012.year	-0.140*** (0.005)	-0.160*** (0.005)
2013.year	-0.221*** (0.005)	-0.261*** (0.005)
2014.year	-0.259*** (0.006)	-0.314*** (0.005)
2015.year	-0.271*** (0.006)	-0.330*** (0.006)
2016.year	-0.244*** (0.006)	-0.270*** (0.006)
2017.year	-0.305*** (0.007)	-0.374*** (0.006)
Intercept	4.268*** (0.026)	4.181*** (0.021)
Number of observations	430,461	430,461

Notes: * Significant at the 10% level. ** Significant at the 5% level. *** Significant at the 1% level.

Data source: calculated by the authors using Vietnam Enterprises Database 2010-2017.

Table 2.9: List of Viet Nam standard industrial classification 2007 (VSIC 2007)

(Issued together with the Prime Minister's Decision numbered 10/2007/QĐ-TTg on January 23, 2007)

Classification	Types of sub-industries
10	Manufacture of food products
11	Manufacture of beverages
12	Manufacture of tobacco products
13	Manufacture of textiles
14	Manufacture of wearing apparel
15	Manufacture of leather and related products
16	Manufacture of wood and products of wood and cork, except furniture; manufacture of articles of straw and plaiting.
17	Manufacture of paper and paper products
18	Printing and reproduction of recorded media
19	Manufacture of coke and refined petroleum products
20	Manufacture of chemicals and chemical products
21	Manufacture of pharmaceuticals, medicinal chemicals, and botanical products
22	Manufacture of rubber and plastics products
23	Manufacture of other non-metallic mineral products
24	Manufacture of basic metals
25	Manufacture of fabricated metal products, except machinery and equipment
26	Manufacture of computer, electronic and optical products
27	Manufacture of electrical equipment
28	Manufacture of machinery and equipment
29	Manufacture of motor vehicles; trailers, and semitrailers
30	Manufacture of other transport equipment
31	Manufacture of furniture
32	Other manufacturing
33	Repair and installation of machinery and equipment

CHAPTER 3: FDI AGGLOMERATION, GEOGRAPHY AND PROVINCIAL FACTORS: EVIDENCE FROM PROVINCIAL PRODUCTIVITY IN VIETNAM

Abstract

With the effective FDI law amendment in 1996, decentralization policy was implemented to provide more power and autonomy to provincial authorities and allow them to develop innovative ways to attract more foreign investors. The central government believes that it can boost productivity among regions due to the positive FDI spillover effects. Using a spatial Durbin model, we provide an empirical assessment of the direct and indirect impacts of FDI agglomeration, regional factors, and local governance quality on the differences in regional TFP for both short-term and long-term. Our study shows that market size and demands positively affect regional TFP while wage level has an adverse effect. In particular, we can criticize some of the indicators of the Provincial Competitiveness Index and investigate which factors change the productivity of a specific province and its neighboring provinces. These findings provide insight implications for Vietnamese local authorities to boost the total productivity of regions and improve the local governance quality.

Keywords: *FDI agglomeration, Spatial Durbin model, regional factors, local governance quality.*

3.1 Introduction

Over the past decades, considerable attention has been paid to the issue of heterogeneity in firms' productivity. Although researchers in many fields have offered abundant empirical evidence showing the magnitude of persistent and ubiquitous productivity differentials across businesses, there is still a topic of debate surrounding the major determinants of such heterogeneity. A great deal of research has sought to investigate the determinants of the firm's productivity and determine their relative weight in explaining the inter-firm disparity. Our theoretical framework draws on two primary schools focusing on how these factors impact firm performances: industrial organization (IO) economists and strategic management researchers. Three prominent perspectives determine firm performance: the success of the industry in which it competes, the country (or region) where it locates, and its intrinsic resources, capabilities, and strategies. Therefore, the determinants of productivity variety can be grouped into internal and external factors, as displayed by Figure 3.1.

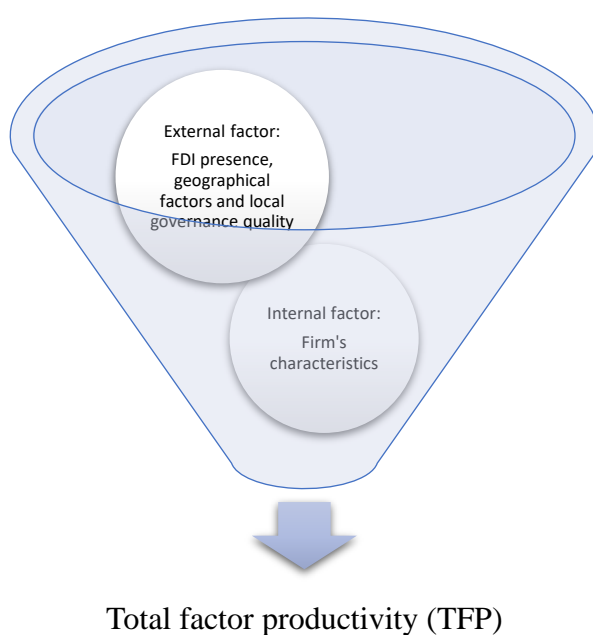


Figure 3.1: Internal and external factors introduced that affect firm's productivity

Competitive advantage is the most widely used term in strategic management research, and they view it as the basis for superior performance. The resource-based theory emphasized the possession of specific vital resources; that is, this theory explained the variances in firm performance due to the characteristics of unique, valuable, difficult-to-replicate firm resources and capabilities (Henderson & Mitchell, 1997; Barney, 1991; Rumelt, 1991; Roquebert et al., 1996; Fahy, 2000). Environmental dynamism, competitors, and technologies resulting in uncertainty allow firms to flexibly adjust strategies to deal with marketplace changes by structuring and coordinating intra- and inter-firm

resources. A contingency theory argued that there is no best way for the managerial outcome, organizational structure, leadership (Shepard & Hougland Jr, 1978). Instead, the optimal course of action is that contingent leaders are flexible in developing the diversification strategy, and they can use its internal coordination mechanisms as a valuable resource and adapt with environmental preferences to attain competitive advantages (Duncan, 1972; Miles et al., 1978; Venkatraman, 1989).

In contrast, IO perspectives stated that several aspects impact the firm's performance; they assumed that "market or industry structures determined member firms' conduct and performance." The influence of the industry environment is the primary factor for gaining a competitive advantage. The traditional I/O perspective provided strategic management a systematic model for valuing external competition within an industry. The central principle of IO theory views that what an organization must do to survive and grow is adapting to changing circumstances in its sector, and the success of the industry in which it competes primarily determines the firm's performance (Barthwal, 2007; Corley, 1990; Ferguson & Ferguson, 1994; Grether, 1970). Following this theory, a firm would choose the correct industry to compete in rather than determine how to compete within a given industry. The empirical studies also support and show evidence that industry factors primarily determine a firm's performance. IO states that firms' performance depends on their ability to adapt to industry forces. Given the importance of market structure and industry factors (Schmalensee, 1985), competencies, resources, strategies, and strengths are assumed to be similar to competitors within an industry. If a firm develops a new, successful strategy, other firms will rapidly imitate by purchasing the resources, competencies that have made the leading firm so profitable. Although the IO theories focus on the impact of industry on individual firms, in some cases, firms are also able to influence the rival's strategy and even modify the market structure.

Accordingly, this study explores firm heterogeneity in understanding and emphasizing external factors such as FDI agglomeration effects, local governance quality, and geographical factors.

First, FDI is introduced as an environmental determinant that affects the firm's productivity. Since the governments in developing countries have put considerable effort into attracting FDI, this action is motivated by the belief that foreign investment benefits the host country directly and indirectly through productivity spillovers and capital. The economic literature stated that FDI externalities affect productivity via forwarding linkages from foreign suppliers to domestic firms and vertical linkages from foreign firms to local suppliers (backward linkages) such as (Kokko, 1996; Rodriguez-Clare, 1996; Smarzynska Javorcik, 2004; Marcin, 2008). On the other side, previous authors have argued that although the government develops a policy to prioritize FDI projects, MNEs also choose a location that fits resource endowments and future potential. The better the fit, the greater the local value-added they generated (McCann & Mudambi, 2004).

Second, the host country government increases spending on putting up the good physical infrastructure required to attract foreign investors such as ports, roads, railways, and telecommunications (Asiedu, 2002, Khadaroo & Seetanah, 2010); source of energy; labor force with advanced education. A region with good determinants as required will be chosen as a key economic zone. Thus, a region with a high level of FDI will be changed and improved in the business environment and local governance quality. On the branch of classical location theory, previous authors focus on investigating the factors that affect FDI location, such as market demand, production cost, wage, and infrastructure quality. In another strand of literature, scholars following new economic geography introduce an integrated and micro-founded approach to spatial economics. It underlines the emergence of large agglomerations which rely on increasing returns to scale and transportation costs. The authors following this branch try to examine the agglomeration effects of FDI decisions (Dunning & Lundan, 2008) and local governance quality in the geographical area where the firms operate (Kneller & Misch, 2012; Daveri et al., 2016).

The effect of the regional factors provides foreign investors with the idea of location decision to set up a business and helps countries get to know exactly the investors' perspectives of what they are concerned about. Thus, investigating the general and particular effects of regional factors is necessary for the policymakers in host countries to establish and improve suitable local policies to attract FDI inflows. However, despite this interest, only a few studies have addressed regional factors and business environment quality on a firm's productivity. In Vietnam, a few studies investigate the impact of local governance quality in general and nothing about the particular effects of local governance quality indicators on the firm's productivity. Vietnam is an interesting case study due to the marked and enduring firm's productivity disparity among regions.

Although there is a stream of existing literature analyzing the FDI-spillovers to local firms within a region such as (Girma & Wakelin, 2002), (Q. Zhang & Felmingham, 2002), (Dunning & Lundan, 2008), (Xu & Sheng, 2012), (Hamida, 2013), (Ramasamy et al., 2017), our study provides an alternative approach to this issue using a spatial econometric model and weight matrix of FDI location and neighborhood. We have confidence in our evidence that provincial productivity is impacted by spatial dependence.

Third, the spatial distribution of FDI-related firms in Vietnam is highly uneven. Vietnam has cultural, economic, and physical diversity. The characteristics of its business environment for investment differ across regions. The uneven economic growth spreads across provinces in the country. Thus, the unique features of each area provide competitive advantages for firms located in these provinces.

In this study, using a micro-dataset to deepen the analysis of regional variation, we may offer more accurate evidence for locational determinants that affect provincial productivity. Our goal is to understand better how location factors and local governance quality affect a province's productivity. The advantage of using the spatial econometric model and weight matrix of FDI location and neighborhood help us provide robust support for investigating how an area with a high level of FDI concentration could externalize their agglomeration effects to region spillovers to nearby regions. Moreover, our contribution is to compare the direct and indirect effects for the regional determinants and local governance quality indicators that affect regional TFP of the province with FDI concentration both in the short-term and long-term.

Finally, most of the papers used The Provincial Competitiveness Index (PCI) to explore the effects of local governance quality in the region on the productivity of local firms. But PCI is an aggregate indicator measured by different dimensions, so analyzing each component in this index will provide strong implications to local authorities to consider the trade-off between the policy to attract FDI and its negative spillover to the other provinces. In this Chapter, we also provide evidence that FDI distribution supports the competitiveness disparity among the productivity of Vietnam's provinces. From a policy perspective, our analysis has an important policy implication for government authorities. One purpose of promoting FDI or their provinces, states, or countries is to boost the provincial productivity of local firms and key economic regions.

The rest of this chapter is organized as follows: Section 3.2 presents the recent overview of FDI inflows in Vietnam to explain why we chose this interesting case study. The theoretical background and related literature review of our empirical model are provided in Section 3.3. Section 3.4 presents the data, research methodology, and variable description used in the regression analysis. Then, sections 3.5, 3.6 show the results and discussion of the findings' policy consequences and theoretical relevance.

3.2 Brief overview of FDI in Vietnamese Provinces

WTO accession was an important milestone in Vietnam. It was the opportunity for Vietnam to record its positive developments in the trade policy and regulatory environment, and a milestone to review and assess the success after 30 years since Vietnam's economic reforms. As a result, Vietnam has emerged as one of the most rapid economic growth in the world in recent years. Trade policy and economic reforms have brought out considerable transformation to the economy in all aspects. It highlights foreign direct investment as a key determinant leading to this outcome. Cost-saving considerations, great potential in the production of labor-intensive exports, and market opportunities

represent appealing reasons for investors to set up production facilities and lead to significant growth in FDI inflows to Vietnam.

Foreign investment laws have been changed to encourage foreign investments since 1996. Vietnam decides to implement a decentralization policy to devolve central government powers and responsibilities to local government in all government administrative sectors. This policy has provided local governments with more policy space and flexibility in mobilizing and allocating their resources in achieving their development goals within the state hierarchy. Decentralization policy and economic reforms have brought considerable transformation to the economy in all aspects, especially FDI inflow into the industrial zones.

Table 3.1: Vietnam’s Industrial Zones and province.

Industrial zone	Industrial zone locations
Northern region (NKEZ)	Ha Noi, Hai Phong, Bac Ninh, Hai Duong, Hung Yen, Vinh Phuc and Quang Ninh.
Central region (CKEZ)	Thua Thien Hue, Da Nang, Quang Nam, Quang Ngai and Binh Dinh.
Southern region (SKEZ)	Ho Chi Minh City, Binh Duong, Dong Nai, Long An, Ba Ria – Vung Tau, Binh Phuoc, Tay Ninh and Tien Giang.

The manufacturing industry in Vietnam has witnessed to have an impressive growth rate. Many investors have established their businesses in this field. Because of its characters, running the entire manufacturing process and setting an infrastructure and heavy equipment requires a large space in this sector. With the aim is to fulfill the high demand from this sector, the industrial zone is developed not only to attract FDI-inflows but also balance among community–economy - environment. Industrial Zones are areas that are zoned and planned by the government for industrial development. Industrial zones are usually on the edges of, or outside, the central residential site of a city with good infrastructures such as transportation access, including airports, roads, and rail. Especially, central government grants a system of incentives and tax concession to local government, then governmental agency establishes and supports activities such as exporting, production, or technology innovation.

FDI inflow entering into provinces countrywide also push up the establishment of industrial zones continuously. According to the Ministry of Planning and Investment statistic, 326 industrial zones were set up countrywide, and 249 were already in operation in 2018. As shown in Table 3.1, most of Vietnam’s industrial zones concentrated on three administrative regions: the Northern, Central, and Southern regions. Each area has its characteristics and unique incentive programs.

Vietnam offers a series of incentives to motivate domestic and foreign investment, including exemptions from import duty or rental land incentives to investors. These incentives and exemptions depend on various factors such as the regional profile, the industry, or investment location.

Table 3.2: Top-ten Vietnamese Provinces with Registered FDI in 2017 (Millions of US\$)

Province	Registered FDI capital (million \$)	Share in Total FDI (%)
Ho Chi Minh City	6745.4	18.18%
Bac Ninh	3623.7	9.77%
Thanh Hoa	3171.7	8.55%
Ha Noi	3059.1	8.25%
Binh Duong	2835.3	7.64%
Khanh Hoa	2626.4	7.08%
Nam Dinh	2318.7	6.25%
Dong Nai	1797.1	4.84%
Kien Giang	1313.3	3.54%
Tay Ninh	1017.7	2.74%
<i>Total</i>	<i>28508.4</i>	<i>76.84%</i>

Source: Author's calculation based on data from the General Statistics Office (GSO) of Vietnam.

3.3 Literature Review

This study bases on traditional Dunning's eclectic paradigm and theories of production location as the most appropriate theory, which explains FDI's location choice for investment. Dunning's eclectic paradigm and theories of production location explain why a specific host country or a specific region within a particular host country is more or less attractive for FDI by using policy, economy variables, and cost of productions.

3.3.1 Eclectic paradigm

Dunning's eclectic paradigm (Dunning & McQueen, 1981; Dunning, 1988) refers to firm-specific advantages such as ownership, internalization, and location advantages to explain the presence and development of multinational corporations (MNCs). The ownership-location-internalization (OLI) model states that all three conditions must be satisfied for potential investing

firms to find FDI. Before entering a foreign country, FDI-related firms possess specific advantages. According to (Dunning, 1973, 1980, 1988), there are several advantages:

- (i) Ownership Advantages including three kinds of specific advantages: (i) monopoly advantages as privileged market access through natural resources, copyrights, trademarks; (ii) technology and knowledge; (iii) Scale of economy, learning, scope, better access to financial capital.
- (ii) Location Advantages include the cost of transport, telecommunications, market size, political advantages, and social advantages.
- (iii) Internalization advantages: when the first two conditions are met, companies can use these advantages in coordination with at least some factors outside their original country.

The central core of Dunning's eclectic paradigm is that one of these advantages may be necessary but not sufficient to attract FDI. It is essential to take into consideration all three conditions together. This model helps us to answer why firms engage in FDI, where and when to participate. But when foreign investors identify a particular country to invest in, they are faced with where to set up their manufacturing plant. The economic geography literature provides an answer to this issue, offering different interpretations of FDI location decisions. The review of these theories is to examine different approaches to the question of optimal position. It will help provide a better understanding of why there is an obvious regional disparity in the FDI allocation in the same country.

3.3.2 Theories of production location

We start with the neoclassical theory, which bases on the assumption of profit maximization of economic agents. Neoclassical location theory is developed based on Weber's classical theory to determine the least-cost location, and then it has been expanded well beyond the classical approach to combine with demand considerations. Next, the behavioral approach is followed to answer the question of location. This approach is regarded as a response to the failure of neoclassical theories. This theory considered the macro-context of the whole economic system that affects the firm's location decision.

Weber's least-cost location theory: One of its (Weber & Friedrich, 1929) core assumptions is that firms will choose a location because of minimizing their total costs. Namely, without external influences, the area takes place in an isolated region composed of one market, and there are no variations in transport costs except a simple function of the distance between spaces and that markets are located in a particular number of centers. The perfect competition assumption of this model implies that a high number of firms and customers prevent the impact of monopolies and oligopolies and perfect knowledge of market conditions, both for the buyers and suppliers. Several natural

resources are available in every area, while many production inputs such as labor, fuel, and minerals are available in a particular region. In summary, three main factors affect an optimal industrial location, including labor costs, transport costs, and agglomeration economies.

The generalized variable cost model: According to critics of this theory, Weber & Friedrich (1929) has unrealistic assumptions of industrial location. Weber has taken only two elements for determining the transportation cost, namely weight and distance. He has not given due to the type of transport, quality of goods to be transported, topography, the character of the region. One of the arguments against this theory mentioned is (Smith, 1981), who developed a model that deals with total costs rather than just the transportation cost, with 'the cost of all inputs treated as continuous spatial variables. He stated that the Weberian triangle could be expanded to an n-corner figure to incorporate more *material* resources, markets, and realistic situations. For example, the cheap labor, capital, land, other input sources can be treated as a corner of the figure. In this case, each corner will exert its plant location proportional to the quantity of input required and the transportation cost. The relative strength of all these determinants will determine the optimal location.

Locational interdependence: As mentioned above, both the neoclassical and generalized variable cost models have drawbacks, and the locational interdependence framework will overcome these. In this model, customers are concentrated at certain places while each seller has an unlimited market. Smith (1981) states that once the demand is various in a different area, if firms locate in a place with low cost, that also leads to low output and revenue for a poor location, that does not mean what the producer aims to achieve. The competition level and behavior of competitors may be an essential characteristic of the business environment in which firms operate and survive if they don't want to be crowded out, this point will affect the location choice of firms (Chapman & Walker, 1991). Following the locational interdependence theory, firms trying to target and control the largest market area possible. Their aim is the firm's revenue, so their shift could be the market demand and the distribution of the market area of competitive firms. For some enterprises, the location where they sell is as essential as what or how they sell. The location of the seller is important and depends on the target customers who are buying a product or service or what supports the business needs. Therefore, examining how firms depend on particular locations will help them adjust their business strategy.

Based on the explanation from the theoretical framework above, the opportunities that a foreign firm set up their production facilities in a particular location depends on many factors such as market demand, market size, labor cost, characteristics of a region, competitors. Therefore, our model can consider these explanatory variables based on the belief that these determinants can affect the firm's productivity—table 3.3 displays the measurement, description, and the expected signs of independent variables in our model.

3.4 Methodology and Data

3.4.1 Data

Our study uses a Vietnamese firm-level dataset from an annual Vietnam enterprise survey conducted by the General Statistics Office (GSO). The survey relies on a census and covers all establishments for the period 2010–2017. This dataset provides intensive information on financial and employment status. For each firm's observation, the dataset includes firm identification, tax code, date of establishment, ownership structure, types of business structures, industry code, number of employees, financial reports, province. First, we based on the individual firm's data to measure the Total Factor Productivity (TFP) by the Cobb-Douglas production function. Next, we gathered information of individual firm's geographic location, TFP, and then used it for estimating provincial TFP. My choice of provincial TFP determinants is presented by the literature review above and the Vietnamese province's data availability. An unbalanced panel dataset of 504 observations in total is provided.

There are 63 provinces⁶ from three industrial zones of Vietnam (including Northern region, Central region, Southern region) and 146,230 firms with 520,396 observations in the sample for 2010 – 2017. Data for FDI projects, GDP per capita, human capital (population, number of labor), labor income in each province are provided by the General Statistics Office of Vietnam (GSO). We collected PCI data, including ten specific dimensions, from its online source. Tables 3.3 and 3.4 display the description and summary statistics for all variables and data sources, respectively.

3.4.2 Variables

3.4.2.1 Dependent variable

The concept of “productivity” has been broadly examined in the economics literature on economic growth and efficiency. The first step in our analysis requires that we estimate productivity for each firm in our sample and then calculate provincial TFP by the characteristic of geographic location. Our study will estimate the Provincial TFP by production functions and compare the productivity differences among provinces.

TFP levels are estimated by using Cobb-Douglas functions from which to compare the productivity differences. Akerberg et al. (2015) developed the ACF methodology, which emphasizes that the restrictiveness of assuming that labor is perfectly flexible in the LP approach can result in the collinearity problem in the input choices of the (Levinsohn & Petrin, 2003) method. As both variable

⁶ In Vietnam, there are 64 provinces before 2009. In 2008, Ha Tay province was merged with Hanoi in 2008. In this study, we merge Ha Tay's data to Hanoi and consider as one province for the period 2009 – 2013.

inputs, i.e., labor and materials, are chosen simultaneously and depend on the same state variables (capital and labor), it is impossible to identify the capital coefficient and labor in the first stage. In contrast to LP and OP, the authors suggest an extension of the LP approach, which estimates the labor coefficient in the second stage to surpass the potential collinearity problem, particularly important in the context of FDI. However, compared to the other approaches, the ACF is one of the most popular approaches in the literature as compared to (Olley & Pakes, 1992) and Wooldridge (2009), as no extensions or alternatives are emerging as superior in all cases. Referring to the literature on different TFP estimations, we implement the structural techniques suggested by ACF to obtain estimates of firm TFP.

3.4.2.2 Independent variables

To explore determinants that affect the firm's productivity in the province and test the hypotheses we put forward, in this section, we introduce variables that affect provincial productivity to data authenticity and availability principles. As mentioned in the literature review, the firm's productivity in the province is influenced by regional characteristics (location factors and local governance quality) and agglomeration effects of FDI. According to (Jordaan, 2012), regional characteristics may be classified: Market size, market demand, production cost, and FDI agglomeration effects.

Market size and market demand: The overall scale is one of the most important determinants that affect the firm's productivity. It's no coincidence that new entrants always target one of the most populous cities, such as Ho Chi Minh or Ha Noi. A high population density will relate to economies of scale in infrastructure and reduce the average transport network cost. Following high density in a population are many benefits such as efficient energy using, greater potential customers, and labor market pools. The growing population also leads to greater scope society will bring out entrepreneurs and innovators, who propose the innovative technology and business. The larger the market size, the high the productivity will be. This study uses the provincial population as the measurement for market size and market demand.

Production cost: Labour cost measured by wage level is often captured in the number of scholars (Coughlin et al., 1990; Friedman & Fung, 1996). Generally, controversial results have been found for the relationship between wage level and productivity. One side of the coin stated that FDI-related company aims a region with a lower-wage to reduce production cost (Jordaan, 2011). Conversely, another side provided evidence that wages have a positive relationship with the productivity of workers. Cassidy & Andreosso-O'Callaghan (2006) indicated that Japanese firms prefer regions with a more educated labor force. We use the average wage level of employees in a province as the proxy for labor cost.

FDI agglomeration effect: The impact of the agglomeration effect has attracted attention from researchers and has been investigated through literature widely. The evidence in (He, 2002; Dunning & Lundan, 2008; Huang & Wei, 2016) stated that multinational enterprises (MNEs) target the region with the large existing FDI-projects concentration because of mutual benefits such as local support facilities, networks, and the specialized and skilled labor market. The more FDI in a region, the more attractive area will be. FDI-related firms locating in a region will bring in advanced methods of production, marketing that generate positive spillover effects to domestic firms. Moreover, they also directly create competitive pressure on domestic firms, forcing local firms to increase their productivity to survive in this fierce market and gain market share. All these factors will result in higher productivity of firms which is located in the same region. We select the cumulative FDI projects in provinces as a proxy for FDI agglomeration effects in a particular area.

Local governance quality: According to the Vietnam Chamber of Commerce and Industry (VCCI), PCI-index measurement changes our mindset and thought on economic governance. Earlier, policymakers and local authorities assumed that these factors, such as geographical location and development of new infrastructure, were necessary. PCI has confirmed that enhancing local governance quality will boost the development of the business sector and foreign investment attraction. PCI introduces an effective oversight tool because it reflects the voice of enterprises. A government always aims to serve and satisfy people and enterprises. It is the ultimate goal of all reforms. And perhaps, this is also the first index in Vietnam to quantify the targets of satisfaction it's people and enterprises with the local governmental levels. PCI also helps promote changes in not only attitudes but also specific activities of the governments. Lots of new reform initiatives have been implemented by provinces thanks to PCI.

To protect and support the business environment quality, contribute to the Vietnamese socio-economic development, and improve commercial and technological cooperation between Vietnam and other countries globally, the PCI index was introduced firstly in 2005 by PCI agencies. This index includes ten dimensions⁷ carried out by a yearly business survey that assessed and ranked the governance quality of each province. It can help local governments look at themselves to adjust their behaviors to provide a better business environment for private sector development. PCI is also

⁷ PCI index defines a province that performs well in 10 dimensions: 1) Entry cost: low entry costs for a business start-up; 2) Land Access and Security of Tenure: easy access to land and security of business premises; 3) Transparency and Access to Information: a transparent business environment and fair business information; 4) Informal Charges: minimal informal charges; 5) Time Costs and Regulatory Compliance: has limited time requirements for bureaucratic procedures and inspections; 6) Policy bias: limit crowding out of private activity from policy biases toward the state, foreign, or connected firms; 7) Proactivity of Provincial Leadership: proactive and creative provincial leadership in solving problems for enterprises; 8) Business Support Services: developed and high-quality business support services; 9) Labour Training: sound labor training policies; and 10) Legal Institutions: fair and effective legal procedures for dispute resolution.

considered a helpful guide for foreign investors and domestic firms to start their business and production. In Vietnam, this index is often used in several papers to measure the local governance quality of provinces (Nguyen & Nguyen, 2007; Tran et al., 2016; Nguyen-Van et al., 2019).

Table 3.3: Variable definitions and expected results

Variables	Type	Description and measurement	Expected sign
<i>Dependent variable</i>			
Provincial TFP	Continuous	Total factor productivity estimated by (Akerberg et al., 2015)	
<i>Independent variable</i>			
Provincial Wage	Continuous	Log of average wage level of employees in a province.	-
Provincial Population	Continuous	Log of Population in each province	+
FDI presence	Continuous	Number of FDI projects in each province	+/-
<i>Local governance quality variables</i>			
<i>Entry costs</i>	Continuous	Low entry costs for business start-up	-
<i>Land Access and Security of Tenure</i>	Continuous	Easy access to land and security of business premises	-
<i>Transparency and Access to Information</i>	Continuous	A transparent business environment and equitable business information	+
<i>Informal Charges</i>	Continuous	Minimal informal charges	-
<i>The proactivity of Provincial Leadership</i>	Continuous	Proactive and creative provincial leadership in solving problems for enterprises	-
<i>Time Costs and Regulatory Compliance</i>	Continuous	Limited time requirements for bureaucratic procedures and inspections	+
<i>Business Support Services</i>	Continuous	Developed and high-quality business support services	+
<i>Labor Training</i>	Continuous	Sound labor training policies	+
<i>Legal Institutions</i>	Continuous	Fair and effective legal procedures for dispute resolution	-

The descriptive statistics for all variables across the regions are in detail in Table 3.4 and three industrial zones (see Appendix - Table 3.8A to 3.8C). To sum up, the comparison results between the three industrial zones show that in terms of GDP per capita, labor cost, and degree of FDI concentration, the southern region is the first rank compared to the other two areas. The labor cost is also highest in the southern region (measured by the average annual wage per employee). PCI index is relatively even between provinces in three industrial zones that show us the local government's effort to improve the business environment.

Table 3.4: Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Provincial TFP	504	2.704	5.892	0.064	42.464
Provincial Wage	504	12.599	35.309	0.249	342.995
Provincial population	504	1.430	1.238	0.298	8.446
FDI presence	504	27.373	88.388	0	963
Entry costs	504	8.057	0.843	5.070	9.598
Land Access and Security of Tenure	504	6.204	0.861	3.040	8.840
Transparency and Access to Information	504	5.971	0.602	2.764	7.630
Time Costs and Regulatory Compliance	504	6.412	0.893	3.510	8.690
Informal Charges	504	5.853	1.120	2.810	8.940
Proactivity of Provincial Leadership	504	5.116	1.115	1.390	9.380
Business Support Services	504	5.229	1.189	1.750	8.750
Legal Institutions	504	5.332	1.089	2.000	7.620
Labour Training	504	5.550	0.840	2.956	8.170

Notes: Data source: calculated by the authors using Vietnam Enterprises Database 2010 - 2017. Methodology. The number of observations is 504.

3.4.3 Methodology

First, we use spatial regression models with a weight matrix based on FDI-concentrated province and their neighboring provinces to provide the empirical results for provincial TFP determinants, including internal and external factors. Second, one of the advantages of using spatial analysis is to capture the direct and indirect effects of spatial independence on provincial TFP. While the direct effect explains the change of TFP in the host province caused by the province-specific explanatory variables, the indirect effect explores the change in explanatory variables of a *province_i* that affects TFP in nearby areas. Finally, by the coefficient of the spatial interdependence, we test if agglomeration and competition effects exist in the provinces that have FDI concentration.

Spatial Weight Matrix

The spatial weight matrix (W_{ij}) is the key component that is widely used in spatial econometric analysis and geographic data science. Spatial weights represent geographical relationships between the target observations and the nearby of that observation in the dataset. In our model, the spatial weight matrix (W) is a binary based on the notion of continuity. First, we defined a province with FDI concentration and then used a spatial weight matrix to capture FDI spillovers to a province with the same border. A *province_i* with FDI concentration will attribute 1, and the element w_{ij} of contiguity matrix takes a value of 1 if *province_i* and *j* share the same border and 0 otherwise. Our spatial weight matrix includes 63 cross-sectional units representing 63 administrative provinces. The summary of spatial-weighting object W detail is shown in the Appendix – *Table 3.11*)

Spatial Durbin Model (SDM)

Our objective mainly explores the direct and indirect effects of regional characteristics, local governance quality, and agglomeration effects of FDI on Vietnamese provincial TFP. The Spatial Durbin Model (SDM) is a general form of the spatial lag model (SAR) and spatial error model (SEM), which can help us capture not only the impact of the explanatory variables on provincial TFP in a particular province but also neighbor areas. We consider that the spatial Durbin model (SDM) is more appropriate for the aim of this study (*see Appendix – Table 3.9, 3.10*). The basic form of our model is:

$$Y_{it} = \rho \sum_{j=1}^N W_{ij} Y_{jt} + \beta X_{it} + \theta \sum_{j=1}^N w_{ij} X_{jt} + \mu + \varepsilon_{it} \quad (1)$$

Where Y_{it} is the dependent variable, here measured as provincial productivity in *province_i* at year t . W_{ij} is the spatial weight matrix representing the neighboring relationships between *province_i* and *province_j* ($j \neq i$). ρ is the spatial autoregressive parameter, which reflects the endogenous spatial interaction between *province_i* and its neighboring provinces. β is a vector of the coefficients of the explanatory variables. X_{it} is the collection of explanatory variables of *province_i* that explain its provincial TFP. θ reflects exogenous interaction effects, which creates an average of explanatory variable values from nearby provinces which are added to the set of conventional explanatory variables. The matrix $w_{ij} X_{jt}$ denotes the spatial lag effects associated with explanatory variables. μ denotes the random-effects or the time and province fixed effects; and ε_{it} represents an error term uncorrelated with the explanatory variables across provinces and over time, which obeys normal distribution. All dependent and independent variable descriptions are displayed in Table 3.3.

According to (LeSage & Pace, 2010), the total effect should be divided into a direct and an indirect effect which provides a better describe the spatial interaction between variables and further confirm the existence of spatial spillover, and the SDM can be displayed as follows:

$$Y_{it} = [(I - \rho\omega)^{-1}(\beta X_t + \theta\omega X_t)] + (I - \rho\omega)^{-1} \varepsilon_t$$

$$\left[\frac{\partial Y}{\partial X_{1k}}, \frac{\partial Y}{\partial X_{2k}}, \dots, \frac{\partial Y}{\partial X_{Nk}} \right] = (I - \rho\omega)^{-1} \begin{bmatrix} \beta_k & \omega_{12}\theta_k & \dots & \omega_{1N}\theta_k \\ \omega_{21}\theta_k & \beta_k & \dots & \omega_{2N}\theta_k \\ \vdots & \vdots & \ddots & \vdots \\ \omega_{N1}\theta_k & \omega_{N1}\theta_k & \dots & \beta_k \end{bmatrix}$$

In our model, the average direct effect measures the average impact on the provincial TFP of a particular province caused by a change in regional factors, local governance quality, or FDI

agglomeration effects of that region. It means it does not capture spatial spillovers (between provinces). The average indirect effect or spatial spillover reflects the cumulative average effect of the changes in a change in regional factors, local governance quality, or FDI agglomeration effects of neighboring regions on the provincial TFP of a specific region. The average total effect is the sum of both the average direct and indirect effects. (Elhorst, 2010, 2012; (LeSage & Sheng, 2014; LeSage, 2014).

Following (LeSage, 2008; LeSage & Pace, 2010) and (Elhorst, 2010), we begin with the SDM as a general specification and test for the alternatives. In using the spatial econometric methods, we used global Moran's I to check spatial independencies in the provincial TFP. The result from Table 3.5 shows that the global Moran'I index for each year has all passed the test at a 1% significant level, and each Moran I value is positive, thus meaning that the spatial econometric model should be chosen for statistical verification using the maximum likelihood method.

Table 3.5: Global Moran's I statistics for Provincial TFP

Provincial TFP (Contiguity)	Moran's I
2010	0.410***
2011	0.524***
2012	0.485***
2013	0.497***
2014	0.502***
2015	0.445***
2016	0.778***
2017	0.730***

Notes: ***, ** and * denote significance at 1%, 5% and 10%, respectively.

The results of the LR test and the Wald test of SDM reject the H_0 hypothesis at a 1% significant level. Thus SDM cannot degenerate into the spatial lag model (SLM) or spatial error model (SEM). After that, we estimate SDM to know if it is the most appropriate model among the other kinds of model selections. (Hausman, 1978) the test result shows that with a 1% significance level test, the fixed-effect model of spatial Durbin model (SDM) should be selected. The value of the natural log-likelihood function, the comprehensive analysis of the R_squared, and the joint significance of the LR test reveal that SDM is more reasonable under the fixed effect. As shown in Table 3.9 and 3.10 (see Appendix), we perform all information criteria to test whether the most appropriate model is SAC or SDM.

3.5 Empirical Results

As seen in Table 3.6, there are strong spatial interactions in provincial TFP. The coefficients of the spatially lagged dependent variable are highly significant. From the estimation results of Table

3.6, the sign of the coefficient of provincial GDP per capita for each province is significantly positive, and this result verifies the importance of the local market in the regions that have an FDI presence. An explanation for that can be that the FDI-related firm prefers locations with larger market magnitude and high consumption volume, leading to increased provincial TFP in a particular province. Our results also explore the existence of agglomeration dynamics in the FDI distribution across Vietnamese provinces. As expectedly, the coefficient from FDI agglomeration effects are significantly positive in the location choice of FDI at a 1% percent level. Clearly, these empirical results explain that FDI presence in a province may externalize a positive spillover effect to local firms by forcing indigenous firms to improve their operations, products, management, and competitiveness. All these factors contribute to the high productivity of local firms and FDI-related firms. However, the sign of FDI presence coefficient is significantly positive in the locations with FDI presence but generates negative spillovers to neighboring provinces.

One of the determinants that attract new entrants into a province is the local governance quality. By PCI – index components, we found that improving local governance quality in an area impacts the provincial TFP of a particular province and externalizes different effects on the neighboring province.

Business support services are the indicator that measures how local firms are supported by trade promotion, business partner matchmaking. Local authorities also provide regulatory information, industrial zones, and technological services for the private sector. The results show that business support services quality is the only indicator with the same effect at a given province and nearby province—the coefficients of business support services are significantly negative at 5%, 10% percent levels, respectively. An increase in the quality of this indicator will decrease provincial TFP either a particular province and nearby province since it will create a competitive environment when as much as enterprise targets this province to set up their business. Local firms not only compete with the other business in this region but also FDI-related firms. The companies that cannot survive in the fierce competition will be crowded out of the province. This competition affects also externalizes to provincial TFP of the surrounding areas.

Proactivity of provincial leadership and business support services are two components that only affect provincial TFP in certain provinces without affecting the neighboring areas. The coefficients on the proactivity of provincial leaders and business support services have a significant contrast at a 1% level.

The proactivity of provincial leaders indicator measures the creativity and keenness of provinces in implementing central policies, strategic plans for private sector development, and

working within the national legal framework to support local private companies in the province. An increase in the quality of this indicator will raise provincial TFP either a particular province and nearby province. Adversely, the business support service indicator measures how complementary services at the province-level promote trading activities in the private sector, provide helpful information regarding the laws and regulations to firms, help the business partner match-make, and support specialized services for firms. An improvement in this component will decrease provincial TFP neither a particular province and a nearby province since it will create a competitive environment and pressure for local firms in this region.

Surprisingly, some of the components of the PCI index, like transparency, access to information, informal cost, and labor training, do not affect the provincial TFP in this province but create negative spillovers to surrounding areas. Labour training is the only factor that spreads positive effects to neighboring provinces, while the rest bring adverse impacts to neighboring regions. Foreign-owned firms will have an efficient wage to encourage and attract the labor workforce to contribute to higher performance. FDI - related firms often offer higher wages than their domestic counterparts. Depending on the supply and demand of the labor market in each region, skilled labor in FDI enterprises can move from one place to another also contributes to increasing provincial TFP in other localities.

Table 3.6: Determinants of Provincial TFP with Weight Matrix for Spatial Dependence

	Main Equation	Estimation with weight matrices
	Coefficient (.Std err)	Coefficient (.Std err)
Lagged Provincial TFP	0.276*** (0.043)	
Provincial Population	0.397 (1.750)	-8.432 (7.003)
Provincial Wage	-0.016 (0.123)	0.320 (0.501)
FDI presence	0.004*** (0.001)	-0.005** (0.003)
Entry costs	-0.140** (0.067)	-0.344 (0.238)
Land Access and Security of Tenure	-0.054 (0.063)	0.438 (0.278)
Transparency and Access to Information	-0.045 (0.083)	-0.622* (0.375)
Time Costs and Regulatory Compliance	0.062 (0.056)	-0.317 (0.222)
Informal Charges	-0.084 (0.052)	-0.882*** (0.166)
The proactivity of Provincial Leadership	0.111*** (0.040)	0.130 (0.162)
Business Support Services	-0.109** (0.052)	-0.290* (0.173)
Legal Institutions	0.033 (0.040)	-0.190 (0.119)
Labour Training	-0.066 (0.069)	0.441** (0.210)
Spatial rho	0.507*** (0.102)	
Number of observations	441	

Notes: Significance levels: *=10%, **=5%, ***=1%.

Compared to traditional linear regression models that treat the provinces as independent of each other, the spatial regression model is appropriate for capturing spatial spillovers of local governance quality, regional factors in a particular province, and the surrounding area (see LeSage & Pace, 2010). As shown in Table 3.6, spatial interactions cause the difference in the marginal effect of local governance quality, regional characteristics across provinces. Table 3.7 displays the major difference of the direct, indirect, and total impact of changes in each independent variable, distinguishing between short and long-run marginal effects. It is worth noting that short-run effects in dynamic models should be compared with margin effects labeled as long-run effects in the static model.

As shown in table 3.7, the coefficients of FDI presence are significant at a 1% level. It provides strong evidence of the direct and indirect effects of FDI on provincial TFP in a province and their neighbor both in the short-run and long run. Our result is contrary between areas with FDI concentration and one without FDI concentration. An increase in FDI presence will improve the productivity of both local firms and FDI-related firms for some reasons:

First, FDI entering any region also brings management expertise and advanced marketing skills called “spillover effects” to local firms. FDI-related firms use advanced production, marketing, and accounting control methods, all of which lead to higher performance. Thus, FDI-related firms also directly create competitive pressure on domestic firms, so domestic firms are forced to increase their productivity to survive in this competitive market and retain their market share. Less efficient local firms may be driven out of the market. Second, the government wants to attract foreign investment to facilitate institutional changes and improve local governance quality. These factors contribute to high productivity in a province with FDI concentration. One of the most significant changes in implementing a legal system is to create a fair and competitive environment by breaking down trade barriers and local protectionism and increasing the transparency of government operations and taxation systems.

In contrast, it creates competition effects among provinces. The uneven incentives and competitive advantages will hurt the nearby province without FDI presence. This result has important implications for Vietnamese regional policymakers to consider the short-run and long-run FDI spillover effects.

Some interesting findings are displayed in Table 3.7. The proactivity of the provincial leaders, entry cost, and business support services are three components that directly affect provincial TFP in an FDI province. But the direct effects have slight differences with the sign of these factors. Only proactivity of the provincial leadership component of PCI-index brings positive direct impact to the province with FDI concentration. The coefficient of this determinant is highly significant both in the short-term and long term. The stronger and better proactivity of provincial leadership, the higher the provincial TFP in a province with an FDI presence. However, the higher the entry cost and business support services point of PCI-index, the lower TFP in an area. Our results also indicate that province-specific local governance quality factors such as informal charges, legal institutions all have adverse indirect effects on provincial TFP in neighboring provinces consistently both in the long-run and short-run.

As seen in Table 3.7, province-specific labor training has positive indirect effects. The indirect long-run impact has the same sign as short-run effects. Hence, we can conclude that these factors

only affect regional TFP at the neighboring province with the province that has FDI presence both in the short-term and long-term in the same direction. This point suggests that the host government try hard to provide an attractive environment for foreign investment with preferential policies will lead to a competitive effect between provinces with FDI concentration and the others and an uneven distribution of provincial productivity.

Table 3.7: Total, direct and indirect effects (SDM with fixed effects) – Provincial TFP

	Short-run Effects			Long-run Effects		
	Direct effects	Indirect effects	Total effects	Direct effects	Indirect effects	Total effects
	Coefficient (.Std err)	Coefficient (.Std err)	Coefficient (.Std err)	Coefficient (.Std err)	Coefficient (.Std err)	Coefficient (.Std err)
Provincial Population	0.559 (1.720)	-2.233 (1.780)	-1.674 (2.314)	0.888 (2.399)	-2.995 (2.374)	-2.108 (3.005)
Provincial Wage	-0.0162 (0.130)	0.083 (0.124)	0.067 (0.177)	-0.027 (0.181)	0.111 (0.164)	0.085 (0.231)
FDI presence	0.004*** (0.001)	-0.002*** (0.001)	0.002* (0.001)	0.006*** (0.001)	-0.002*** (0.001)	0.003** (0.002)
Entry costs	-0.137** (0.065)	-0.065 (0.061)	-0.201** (0.080)	-0.187** (0.092)	-0.077 (0.082)	-0.264** (0.104)
Land Access and Security of Tenure	-0.0575 (0.061)	0.115* (0.069)	0.057 (0.084)	-0.086 (0.085)	0.156* (0.092)	0.071 (0.110)
Transparency and Access to Information	-0.0303 (0.081)	-0.153 (0.095)	-0.184 (0.119)	-0.034 (0.113)	-0.201 (0.126)	-0.236 (0.155)
Time Costs and Regulatory Compliance	0.0703 (0.055)	-0.0828 (0.058)	-0.013 (0.068)	0.102 (0.077)	-0.114 (0.077)	-0.012 (0.089)
Informal Charges	-0.0648 (0.051)	-0.211*** (0.042)	-0.276*** (0.057)	-0.079 (0.071)	-0.276*** (0.057)	-0.355*** (0.074)
Proactivity of Provincial Leadership	0.108** (0.043)	0.0197 (0.041)	0.128*** (0.049)	0.149** (0.060)	0.019 (0.056)	0.169*** (0.064)
Business Support Services	-0.104** (0.051)	-0.0578 (0.045)	-0.162*** (0.056)	-0.142* (0.072)	-0.070 (0.061)	-0.211*** (0.074)
Legal Institutions	0.0406 (0.040)	-0.0551* (0.032)	-0.015 (0.039)	0.059 (0.056)	-0.0757* (0.043)	-0.017 (0.051)
Labour Training	-0.0738 (0.070)	0.117** (0.057)	0.044 (0.065)	-0.109 (0.098)	0.161** (0.078)	0.052 (0.086)

Notes: Significance levels: *=10%, **=5%, ***=1%.

3.6 Conclusions

The tremendous amount of FDI inflows into Vietnam is one of the most notable changes in Vietnam's economic development. There is an obvious regional disparity in the FDI distribution across regions in Vietnam. Most FDI projects concentrate in very few provinces, while there are very few FDI inflows for most of the provinces. Thus, our study provides meaningful implications to local policymakers on how to attract FDI into their regions. Following location theory, we investigate the determinants that significantly determine provincial TFP across areas in Vietnam for 2010-2017, primarily we focus on the spatial distribution of FDI.

The empirical results reveal that the uneven provincial TFP in Vietnam is affected by the regional characteristics, local governance quality differences among provinces, and FDI agglomeration effect. Although the agglomeration effect is believed to generate a significant and positive impact on locations with FDI concentration, our empirical results proved that FDI agglomeration effects might influence heterogeneous firms in different ways in each province. Because of the efforts of local government to attract FDI, these provinces will benefit from better infrastructure and higher local governance quality that will lead to an increase in provincial TFP. The local government creates a favorable environment and provides a series of incentives to encourage foreign investment. Therefore, this leads to the results that provincial TFP is only high at FDI location choice because local firms cannot enter the industry and compete with FDI-related firms in the same province. It also causes adverse effects to the neighboring area, and a probable reason is that the advantage of technological monopolies and competition effects of FDI-related firms may crowd out local firms in the same region. Our results suggest that domestic firms need to consider conditions to choose the location to set up rather than based on some better geographic factors and forget about the competition effects of foreign firms. These findings have an important implication for Vietnamese policymakers and local investors.

Our findings also contribute to the literature on the effects of local governance quality more systematically. The spatial regression model helps us explore four specific explanations: direct and indirect effects, short-run and long-run effects of each determinant that change provincial TFP in a particular province, and neighbor province. This contribution will help the local authorities develop a comprehensive PCI index and systematically improve local governance quality of the business environment to avoid focusing only on FDI-provinces, creating tremendous competitive pressure on local businesses, and causing negative impacts on the nearby region.

Appendix

Table 3.8A: Descriptive Statistics - Northern region (NKEZ)

Variable	Obs	Mean	Std. Dev.	Min	Max
Provincial TFP	56	6.37	7.89	1.16	29.62
Provincial GDP	56	4.53	0.81	3.28	6.74
Provincial population	56	0.52	0.63	0.01	2.00
Provincial Wage	56	2.87	1.11	0.99	5.54
FDI presence	56	81.79	120.91	5.00	554.00
Entry costs	56	7.92	0.85	5.33	9.28
Land Access and Security of Tenure	56	5.59	0.85	3.04	7.22
Transparency and Access to Information	56	5.91	0.67	3.32	7.11
Time Costs and Regulatory Compliance	56	6.21	0.81	3.57	7.88
Informal Charges	56	5.65	1.04	3.50	8.10
Proactivity of Provincial Leadership	56	4.97	1.27	2.32	8.08
Business Support Services	56	5.83	1.12	3.45	7.68
Legal Institutions	56	5.31	1.05	2.70	7.41
Labour Training	56	6.10	0.97	4.33	8.17

Table 3.8B: Descriptive Statistics - Central region (CKEZ)

Variable	Obs	Mean	Std. Dev.	Min	Max
Provincial TFP	40	1.69	0.71	0.65	2.81
Provincial GDP	40	3.65	0.33	2.95	4.15
Provincial population	40	0.21	0.17	-0.08	0.42
Provincial Wage	40	1.54	0.65	0.60	3.01
FDI presence	40	12.68	13.18	1.00	59.00
Entry costs	40	8.46	0.68	6.58	9.60
Land Access and Security of Tenure	40	6.33	0.82	4.34	8.65
Transparency and Access to Information	40	6.48	0.44	5.71	7.63
Time Costs and Regulatory Compliance	40	6.82	0.66	5.24	8.11
Informal Charges	40	6.10	1.05	4.16	8.53
Proactivity of Provincial Leadership	40	5.54	1.14	3.54	7.75
Business Support Services	40	5.29	1.12	2.58	7.62
Legal Institutions	40	5.77	1.09	2.92	7.53
Labour Training	40	5.90	0.96	4.46	8.07

Table 3.8C: Descriptive Statistics - Southern region (SKEZ)

Variable	Obs	Mean	Std. Dev.	Min	Max
Provincial TFP	64	9.50	11.96	1.07	42.46
Provincial GDP	64	4.76	1.06	3.01	7.03
Provincial population	64	0.58	0.65	-0.12	2.13
Provincial Wage	64	3.02	1.22	0.68	5.84
FDI presence	64	109.47	191.88	6.00	963.00
Entry costs	64	7.92	0.86	5.23	9.44
Land Access and Security of Tenure	64	6.42	0.78	4.33	8.37
Transparency and Access to Information	64	6.11	0.66	3.37	7.39
Time Costs and Regulatory Compliance	64	6.56	0.73	4.48	7.93
Informal Charges	64	6.20	1.16	4.28	8.62
Proactivity of Provincial Leadership	64	5.28	1.05	1.93	7.69
Business Support Services	64	5.45	1.16	2.49	7.82
Legal Institutions	64	5.46	1.01	3.07	7.30
Labour Training	64	5.65	0.71	4.24	7.29

Table 3.9: Model selection – SDM (fixed effects), SDM (random effects), and SAC

	SDM	SDM	SAC
	(Fixed Effect)	(Random Effect)	
	Coefficient (.Std err)	Coefficient (.Std err)	Coefficient (.Std err)
Provincial Population	-0.038 (1.796)	4.738*** (0.918)	1.004 (1.213)
Provincial Wage	0.048 (0.129)	-0.164 (0.119)	-0.013 (0.091)
Entry costs	-0.057 (0.054)	-0.074 (0.059)	0.030 (0.030)
Land Access and Security of Tenure	-0.066 (0.058)	-0.062 (0.063)	0.021 (0.038)
Transparency and Access to Information	-0.012 (0.078)	0.004 (0.085)	0.024 (0.057)
Time Costs and Regulatory Compliance	-0.014 (0.055)	-0.020 (0.060)	-0.040 (0.036)
Informal Charges	-0.057 (0.050)	-0.074 (0.055)	-0.048 (0.031)
The proactivity of Provincial Leadership	0.108*** (0.040)	0.109** (0.044)	0.034 (0.026)
Business Support Services	-0.100* (0.051)	-0.0927* (0.056)	-0.042 (0.034)
Legal Institutions	0.060 (0.039)	0.0722* (0.042)	0.0425** (0.021)
Labour Training	-0.072 (0.070)	-0.106 (0.076)	0.0853** (0.039)
FDI presence	0.00394*** (0.001)	0.00468*** (0.001)	0.001 (0.001)
Intercept		2.693** (1.057)	
W_x			
Provincial Population	-17.09*** (6.263)	1.844 (3.323)	
Provincial Wage	0.813 (0.503)	0.138 (0.432)	
Entry costs	0.162 (0.152)	0.246 (0.153)	
Land Access and Security of Tenure	0.567*** (0.220)	0.637*** (0.227)	
Transparency and Access to Information	-0.211 (0.308)	-0.121 (0.325)	
Time Costs and Regulatory Compliance	-0.24 (0.222)	-0.156 (0.226)	
Informal Charges	-0.678*** (0.165)	-0.561*** (0.167)	
The proactivity of Provincial Leadership	0.108 (0.152)	0.0396 (0.164)	
Business Support Services	-0.242	-0.00508	

	(0.180)	(0.171)	
Legal Institutions	-0.0805	-0.116	
	(0.112)	(0.117)	
Labour Training	0.772***	0.558**	
	(0.212)	(0.226)	
FDI presence	-0.002	-0.006**	
	(0.003)	(0.003)	
<i>Robust Hausman Test (FEM vs REM)</i>	966.28***		
Spatial			
rho	-0.339***	-0.193**	1.127***
	(0.09)	(0.09)	(0.03)
lambda			-1.77***
			(0.05)
lgt_theta		-2.070***	
		(0.12)	
Number of observations	504	504	504
R-sq	74.9%	80.5%	38.7%

Table 3.10: Test for model selection (SAC and SDM)

	Provincial TFP	
	AIC	BIC
SDM	1165.873	1275.660
SAC	1031.015	1094.354

Table 3.11: Summary of spatial-weighting object W

Matrix	Description
Dimensions	63 x 63
Stored as	63 x 63
Links	
Total	81
Min	0
Mean	1.286
Max	8

CHAPTER 4: TOWARD AN ALTERNATIVE EXPLANATION FOR THE NATURAL RESOURCE CURSE: BRIBE AND FISCAL POLICY⁸

Abstract

We revisit the “natural resource curse” issue and propose a new mechanism to explain the crowding-out effect of natural resources on FDI based on bribes and fiscal policy. We compare two frameworks: a benchmark model with no natural resources in the target country and a full model with a natural resource presence. We show that bribery only exists when the target country has natural resources. Our framework explains one motivation for subsidizing foreign investments in the resource sector: The governmental agency has a stronger bargaining position than FDI-related firms in the natural resource sector. By subsidizing FDI in this sector, they tend to favor oversized projects obtain higher bribes from foreign firms. The optimal choice for an FDI agency is to set higher tax levels on FDI in the non-resource sector and to subsidize the natural resource sector. Fiscal policy distortion creates the crowding-out effect of foreign investment in the non-resource sector. When the productivity of foreign firms in the natural resource sector is low, and when the central government does not offer the FDI agency a high incentive power, the decrease of the FDI inflows in the non-resource sector outweighs the increase of the FDI in the resource sector which leads to a decline of the total FDI inflows in the economy; thus there is an FDI resource curse! We also suggest that it is more difficult for a developing country to offer the right level of incentives to the FDI agency due to the high marginal cost of public funds, which explains that the FDI-resource curse mainly exists in developing countries!

Keywords: Corruption, government subsidies, FDI, and the natural resource curse.

⁸ This chapter is written with Prof. Jocelyn Donze.

4.1 Introduction

Developing countries have seen FDI as a source of economic development and modernization, income growth, and employment. These nations have liberalized their investment regimes to attract more FDI to maximize benefits from international enterprise presence in the domestic economy. The FDI-attracting policy is now commonplace among less developed countries; they use an array of incentives to attract a larger share of the FDI pie, including tax holidays, job-creation subsidies, and even the construction of industrial facilities. On the side of foreign investors, there are a set of different goals and motivations that a foreign firm targets to invest in a country, such as natural-resource-seeking, market-seeking, efficiency-seeking, and strategic-asset-seeking. One of their objectives is to get access to a natural resource not available in the company's home market because of the unbalanced distribution of natural resources in each country. That's why there is a common idea that resource-rich countries such as oil and gas attract more FDI.

Related to FDI and natural resource nexus, many authors focus on the FDI - natural resource nexus, and it does raise the question of this relationship is affected by the institutional quality of a particular country (E Asiedu, 2013; Carril-Caccia et al., 2019; Poelhekke & Van Der Ploeg, 2013). The existing literature reported three emerging results: First, in the series of research from (Poelhekke & van der Ploeg, 2010; Poelhekke & Van Der Ploeg, 2013) and (Elizabeth Asiedu, 2002; E Asiedu, 2013), these authors stated that natural resources harm non-resource FDI but have a positive effect on resource FDI. Second, the crowding-out effect dominates the crowding-in effect, so that total FDI is less in resource-rich countries (E Asiedu, 2013; Poelhekke & Van Der Ploeg, 2013). Third, the high-quality institution could mitigate the adverse influence of natural resources (E Asiedu, 2013; Carril-Caccia et al., 2019), and it can completely neutralize the FDI-natural resource curse (Carril-Caccia et al., 2019; Paton, 2018).

Several reasons have been proposed to explain these empirical findings. The first explanation is related to "Dutch disease," where resource booms correspond with an appreciation of the local currency. It makes the country's exports less competitive at world prices and crowds out investments in non-natural resource sectors. Domestic income and aggregate demand increase lead to a higher price (including input costs and wages) and a profit cut-off for non-tradable goods (Chirkova, 2017; Van der Ploeg, 2011). The second reason is related to the "crowding-out effect" since the crowding-out effect dominates the crowding-in impact so that total FDI is less in resource-rich countries (E Asiedu, 2013; Poelhekke & Van Der Ploeg, 2013). A third explanation argues that price volatility in natural resources creates volatility growth in the exchange rate (Rodriguez & Sachs, 1999); uncertainty among investors (Cavalcanti et al., 2011; Van der Ploeg & Poelhekke, 2009), and

uncertainty in both government revenue and national spending and investment. A higher share of natural resources in total merchandise exports implies less trade diversification, making a country more vulnerable to external shocks. Last, FDI in natural resource-rich countries is concentrated in the natural resource sector. While natural resource exploration requires a large initial capital outlay, continuing operations demand a small cash flow. Thus, after the initial phase, FDI may be staggered.

This study proposes a new mechanism to explain the crowding-out effect of natural resources on FDI based on bribes and fiscal policy. We compare two frameworks: one in which there are no natural resources in the target country, and another in which natural resources are present. In the latter case, we assume that the governmental agency in charge of FDI has some bargaining power over the foreign investors in the resource sector and can therefore impose a bribe. In both frameworks, the governmental agency of the target country can encourage or discourage the FDI inflows through a system of tax and subsidies subject to a budget constraint. The agency and the firms decide the amount of FDI altogether, given the tax system.

When the target country has no natural resources, bribery is not possible, and in this case, we show it is optimal for the FDI agency not to tax nor to subsidize the FDI in the non-resource sector. When the target country has natural resources, bribery becomes possible in the resource sector, and in this case, we show it is optimal for the FDI agency to tax the foreign investments made in the non-resource sector and subsidize the resource sector. By distorting the tax system on FDI, the agency induces a higher foreign investment in the resource sector and, therefore, a higher bribe! The same modification of the tax system makes the foreign investment in the non-resource sector decrease relative to the case with no resource. We show that when the productivity of foreign firms in the resource sector is not too high and when the agency is not very incentivized by the central government, the total FDI inflows are smaller with natural resources than without there is an FDI resource curse!

We also show that the FDI resource curse can be somehow alleviated with better governance and a governmental agency better incentivized. When the payment scheme of the governmental agency is made more dependent on the total FDI inflow (and therefore relatively fewer bribes), the agency is less inclined to distort the fiscal policy on FDI and corruption is less pregnant. Similarly, the FDI resource curse disappears when the productivity of foreign firms in the natural resource sector becomes sufficiently high. In this case, even the distortion of the fiscal system is not sufficiently strong to make the total FDI inflows in the framework with resources smaller than the FDI inflows of the framework with resources.

It is often asserted that bribery is an acute problem in emerging market countries, most notably in the resource sector (Shleifer & Vishny, 1993; Mauro, 1995)⁹. According to common sense, corruption could hurt attracting FDI because bribes can be considered as an indirect tax that creates a range of financial distortion such as: reducing returns for all entrants (Demirbag et al., 2007; Glass & Wu, 2002; Uhlenbruck et al., 2006); facing the higher cost of contract due to higher risks (Saha & Thampy, 2006) or the threat of dealing with corrupt officials or institutions (Mauro, 1995; Shleifer & Vishny, 1993; Christiansen et al., 2003); reducing the benefit of incentives (Wei, 2000; Voyer & Beamish, 2004). Nevertheless, when natural resources are involved in the host country, foreign investors may be more willing to deal with a corrupt regime because the necessity of pursuing natural resources limits their locational decisions. The host country's government that possesses the scarce natural resources necessary for foreign firms' production has a stronger bargaining position due to the competition of firms to enter this sector. Interestingly, it seems that in many developing countries, corruption is considered as a “helping hand” if this allows foreign investors access to resources at a lower royalty cost, with less regulation, or with tax incentives and subsidies. In the report of (OECD, 2014), almost one-third of foreign bribery cases occurred in the natural resource sectors. Figure 4.1 sets out nearly one-third of foreign bribery cases that account for approximately 32% occurred in the natural resource sectors such as extractive, water supply, agriculture, forestry, and fishing, electricity, and gas.

⁹ It is true even after OECD Anti-Bribery Convention entered into force in 1997. Before 1997, bribes were common in international business transactions and foreign firms often had to "grease the wheels" to facilitate dealings and get the right to do business. The OECD Anti-Bribery Convention became effective in 1997 and required the responsibility of members to enact domestic anti-bribery legislation consistent with the Convention signed. It aimed to create a fair and transparent playing field in the international business environment. Nevertheless, there is evidence of (OECD, 2014), that bribing practices have continued after 1997 with new shapes compatible with the convention. For examples US, European and Japanese companies began to form joint ventures with family members and personal associates of the country's leadership, lending them the funds necessary to take an equity position in the partnership. The equity position constitutes a “gift” in exchange of a preferential treatment for the foreign investor.

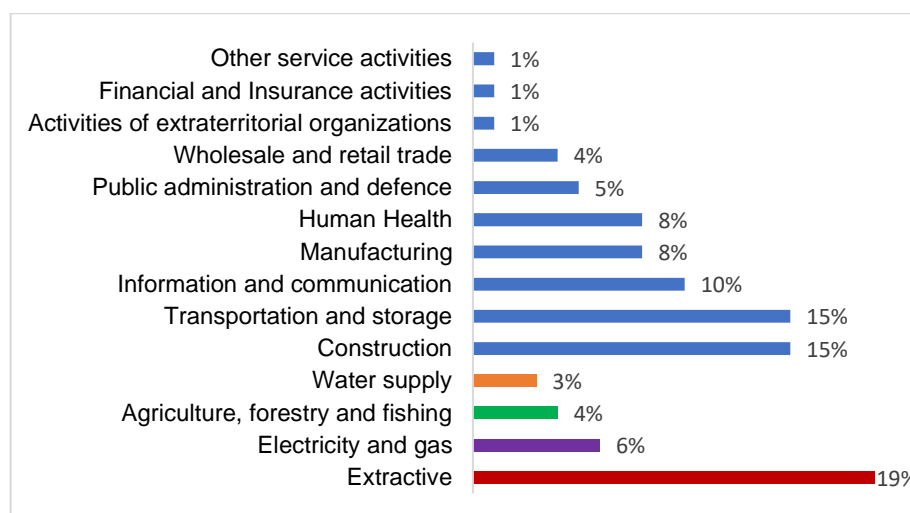


Figure 4.1: Almost one-third of foreign bribery cases occurred in the natural resource sectors¹⁰.

Source: OECD analysis of foreign bribery cases concluded between 15/02/1999 and 01/06/2014

To study the interplay of fiscal policy and bribery related to FDI, we compare a benchmark model (with one representative foreign firm) in which FDI takes only place in the non-resource sector to a full model (with two representative foreign firms) in which FDI takes place in the non-resource and the resource sectors. In the full model, we assume that the governmental agency in charge of FDI (FDI agency) has some bargaining power over the foreign firms in the natural resource sector and thus, impose a bribe on them. The governmental agency can encourage or discourage the FDI inflows by setting taxes and subsidies under a budget constraint in both models. The agency and the firm(s) decide the amount of FDI altogether.

In the benchmark case where there is no natural resource, it is optimal for the governmental agency not to tax or subsidize FDI in the non-resource sector, and bribe is impossible. Conversely, when natural resource exists in the full model, bribery becomes possible in the resource sector, and our results prove that it is optimal for the FDI agency to tax foreign firms invested in the non-resource sector. By distorting the tax system on FDI, the governmental agency promotes a higher foreign investment in the resource sector to obtain a higher bribe. The same tax system makes the foreign investment in the non – resource sector decrease. We show that when the foreign firm in the resource sector is not too productive and when the FDI agency is not very incentivized by the central government, the total FDI is smaller with the natural resource sector than the non-resource sector: that is the explanation for the FDI resource curse.

¹⁰ Sectors are referenced to the United Nations International Standard Industrial Classification of All Economic Activities (UN ISIC), Rev.4 (<http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27&Lg=1>).

Moreover, we also notice that the natural resource curse can be somehow lessened with better governance and an incentive motivation of central government to FDI agency. When foreign firms in the natural resource sector become more productive, the agency is less willing to distort the fiscal policy on FDI and corruption is less pregnant. In this case, even the distortion of the fiscal system is not sufficiently strong to make the total FDI inflows on the framework with resources smaller than the FDI inflows of the framework without resources.

We make the following contributions for insights into the “natural resource curse” explanation.

First, this study is one of the first attempts to provide a comprehensive analysis by the theoretical framework to explain the “natural resource curse” and support the fact that the previous authors (E Asiedu, 2013; Poelhekke & Van Der Ploeg, 2013) provided at the micro-level, which further make a clear picture of the FDI-natural resource nexus.

Second, we propose an explanation that the more such tax subsidies are available to foreign investors, the higher the level of corruption (Hausmann, Ricardo Fernandez-Aria, 2000; Cuervo-Cazurra, 2008). Investment costs in countries with high levels of corruption will be higher, so foreign investors consider government subsidies as a way to overcome those barriers. The existence of direct and indirect subsidies can therefore be compensation or a sign for weak institutions.

Third, we propose a possible explanation for the existence of oversized projects, notably in the domain of natural resources. Several authors have reported that a country with a higher level of corruption tends to invest more in prestigious infrastructure projects (e.g. Dorożyński et al., 2015). Our model offers the following explanation for this fact. In our model, when corruption and bribery are present, the government agency subsidizes the natural resource firm to foster the realization of a large investment and to receive a larger bribe. Therefore the size of the natural resource project is bigger!

Fourth, we propose a tool by which corruption can be somehow reduced by assigning the right incentives to the FDI agency. In the model, when the central government increases the power of incentives for the agency in charge of the FDI, the agency will be induced to increase the total FDI inflow because the reward of this acting is higher, and as a consequence, the agency will be less motivated to distort the fiscal policy on FDI, and corruption will also be lessened. Therefore, better institutional quality leads to less corruption and a higher total FDI inflow. Nevertheless, we will also see that it may be difficult for a government to implement the right incentives in developing countries because of a higher marginal cost of public funds.

The remainder of this Chapter is organized as follows: the related literature review of our model is provided in Section 4.2. Section 4.3 provides an overview of the model and derives the

equilibrium properties, while section 4 examines the effect of bribes on natural resource – FDI nexus. Section 4.5 concludes with a discussion of the policy consequences and theoretical relevance of the findings.

4.2 Literature review

4.2.1 Natural resource and FDI

According to the World Trade Report (WTR, 2010), natural resources could be defined as “stocks of materials that exist in the natural environment that are both scarce and economically useful in production or consumption, either in their raw state or after a minimal amount of processing. Natural resources are indispensable for modern economies and for achieving and maintaining high standards of living in all countries. These are primary inputs in producing all manufactured goods (e.g., ores and other minerals). They provide the energy needed to transport people and goods from place to place, light our cities, and heat our homes and places of work (fuels). They are also a potentially unending source of valuable materials and habitats for wildlife and plant species (forests, oceans). Finally, water is necessary for sustaining all life on the planet.

International trade allows countries with limited domestic supplies to benefit from the use of these materials. Trade also contributes to efficiency in production, provides exporting countries with earnings that can be re-invested in future production, and enables them to diversify their economies. According to (Dunning, 2000), natural resource-seeking investment is one of the types of foreign direct investment that mainly focuses on rich raw resources such as oil, minerals, raw materials, or agricultural products, low-cost labor, technological assets, and physical infrastructure. This kind of FDI mostly requires significant capital expenditure and is relatively location-bound. The United Nations Conference on Trade and Development (UNCTAD) stated that resource-seeking investment was the most common foreign direct investment (FDI) type in the 19th and 20th centuries. It remains very significant, but it has been replaced in priority by other kinds of FDI in today’s more globalized world. FDI resource-seeking motivation may provide training and enhance skills, create employment opportunities, and reduce underemployment of labor and resources. Narula & Dunning (2010) stated that where a region or a country has an absolute advantage in a given scarce resource, the government of that location is in a strong bargaining position. If natural resources are scarce, then the marginal cost of its extraction to both parties is almost zero. On the side of the host country, the cost to access natural resources would be a key factor for FDI firms to gain profits.

In contrast, countries that possess these scarce resources may benefit from these investments because FDI companies may bring technical expertise crucial in exploration and production; employ labor in the local regions. Companies based in non-natural resource or non-natural resource sectors

can conduct resource-seeking investments in natural resources. There is a common idea that multinational companies from developing countries should access natural resources and secure the supply of raw materials for their rapidly growing economies. Those companies from poor natural resource countries have the motivation to invest in locations determined by the availability of assets.

One branch of the research reported that resource-rich countries motivate more FDI. Kolstad & Wiig (2012) performed an econometric analysis of the host country determinants of Chinese outward FDI from 2003–2006. Significant natural resources and poor institutions are the key drivers to attract Chinese outward FDI to large markets. Similarly, Anarfo et al. (2017) examined the importance of infrastructure development and natural resources on FDI inflows in Ghana from 1975 to 2014. Their findings suggest that infrastructural development and natural resources are the key drivers of FDI inflows. While Ghana is trying to expand its infrastructure and natural resources to promote FDI inflows and economic growth, this must be done to create an enabling business environment to ensure macroeconomic stability. Using the unique panel datasets for 25 transition economies between 1990 and 1998, Kinoshita & Campos (2006) examined the determinants such as institutions, agglomeration, and trade openness, a natural resource that impacts the location choice of investors. They found different results between Eastern European and Baltic countries. Agglomeration matters only for Eastern European countries, natural resources and infrastructure matter for Baltic countries.

Conversely, many existing studies support the idea related to the natural resource curse to investigate the relationship between FDI-natural resources. “Natural resource curse” represents an economic phenomenon associated with resource-rich countries. The term tries to explain a paradox that countries gifted natural resource abundance are poorer. In agreement with this strand, the previous authors explain the natural resource curse in many ways: (i) an appreciation of the local currency (Chirkova, 2017; Van der Ploeg, 2011), (ii) an increase in volatility of the exchange rate (Rodriguez & Sachs, 1999), (iii) corruption (Torvik, 2002; Dorożyński et al., 2015; Coyne & Moberg, 2015).

The current debate about FDI and the natural resources nexus has seen public attitudes and expert opinion alternate between optimism and pessimism. Growing concern for this issue has once again brought these issues to policymakers. Essential background information on these issues provides a deeper understanding of policymakers' challenges, and a coherent theoretical framework is needed. The development of this theoretical framework is the subject of Section 4.3.

4.2.2 Taxes and subsidies on FDI

In the UNCTAD Series on issues in international investment agreements (2004), incentives play an essential role in the global competition for the host country to attract foreign direct investment (FDI) and pursue their development strategies. According to UNCTAD's (2000) international survey, almost all countries offered incentives aimed at particular regions and sectors. Although the advice given to national governments is that they should focus on attracting FDI by improving the enabling environment, up to 70% of countries offered regional incentives for their development objectives through more targeted policies toward investment attraction (Christiansen et al., 2003). The host government aims to use incentives as compensation for deficiencies in the business environment, correct the failure of markets, and capture benefits from FDI. They encourage subsidizing policy by influencing foreign investors' location, size, type, and mode of entry.

Incentives vary in type: financial incentives, such as outright grants and loans at concessionary rates, and fiscal incentives such as tax holidays, tax exemption or tax reduction from a company's payments or other incentives including subsidized infrastructure or services, market preferences, and regulatory concessions, including exemptions from labor or environmental standards mean that MNEs are exempt from the national regulations (Bellak et al., 2009; Bellak & Leibrecht, 2009). The previous studies (Christiansen et al., 2003) show that the FDI attracting policies are very diversified.

Governments also need to be wary of the duality of using this tool. First, authorities need to decide how much to subsidize investment projects, and it's required to balance between the difficulties of political and economic choices. Over-subsidizing projects would create unintended economic disturbances if they made the wrong decision. On the other hand, competition may help capital distribution among regions, but this advantage needs to be considered with the budgetary cost. Local authorities provided uneven incentives to foreign investors among areas due to their specific target, which will lead to a "crowding-out effect" of investment; other investors may threaten to move away. More mobile enterprises will become the winners in this game to benefit from incentives and respond to such threats. The losers are ones unable or unwilling to move. Particularly, small-sized firms may face this threat since they cannot negotiate an incentive agreement.

In one branch of research, the authors compare different incentive policies to attract FDI arrivals. Policy implications from (Yu et al., 2007) proved that using entry subsidies is more economical and efficient than tax rate reduction. Tian (2018), comparing investment cost subsidy and tax rate reduction, concluded that the government immediately trades off the cost of the subsidy compared with the tax rate reduction. The optimal FDI-attracting policy depends on the growth rate and the profit volatility, and discount rate. Christiansen et al. (2003) used the case of Brazil to state

that the existing policy relies more heavily on fiscal incentives. The reason is that the budget impact of deferred tax revenues is much smaller than the direct cost required to be financially encouraged. These forms also depend on the type of foreign investment or by creating high labor employment. The evidence from (Cass, 2007; Hintošová & Ručinský, 2017; Hungerford & Gravelle, 2010) confirmed the significant and incremental impact of subsidies on FDI-inflows.

4.2.3 FDI and corruption

It is a large debate surrounding the definition of corruption, with many authors expressing different approaches on the subject. The narrow approach defines that corruption is the use of public office for private gain". The broad approach widens the scope in the public office and the private or commercial. The sector in which foreign investment is restricted by barriers to entry. It may be natural (the cost to have the right to drill a new oil well), created by governments (licensing fees or patents stand in the way), or by other firms (regulatory barriers afford artificial monopoly rents to any firm that can enter or startup). Bribe payment is considered indirect tax creates a range of financial distortion, especially if the government intends to maintain the trade protection fence.

Many authors found the evidence to answer whether corruption will motive foreign investments or discourage the motivation of foreign investors. The first branch of literature reported that corruption discourages the motivation of FDI inflow because they consider bribes as an indirect tax that creates a range of financial distortion such as: reducing returns for all entrants (Demirbag et al., 2007; Glass & Wu, 2002; Uhlenbruck et al., 2006); facing with the higher cost of contract due to higher risks (Saha & Thampy, 2006), reducing the benefit of incentives (Wei, 2000; Voyer & Beamish, 2004). In contrast, the second branch argued that multinational firms are willing to pay bribes to speed up the bureaucratic processes to obtain business licenses for setting up a foreign plant (Lui, 1985; Wheeler & Mody, 1992; Cheung et al., 2012). The foreign investors consider bribes if the investment revenue exceeds the cost of corruption, then corruption may motivate FDI inflows (Woo, 2010).

Moreover, FDI and corruption is a causal effect, and many previous studies also reported the impact of FDI on corruption through two branches of research:

First, the existing studies concern whether foreign-owned firms tend to reduce corruption in host countries. Many studies found that a country with a high level of openness reduces petty corruption by decrease monopoly rent and bribes (Bohara et al., 2004; Larraín B & Tavares, 2004; Brouthers et al., 2008; Sandholtz & Gray, 2003; Rose-Ackerman, 2013;). Kwok & Tadesse (2006) found evidence that MNEs might affect the levels of corruption and restrain corruption in host countries. Larraín B & Tavares (2004) also showed that FDI is associated with lower levels of

corruption. The explanation is provided that FDI firms reduce corruption by diffusing their positive corporate governance to local firms and governance in the host country. When local firms in the same industry or region adopt and imitate business practices and international preferences, that will positively affect local governance and the business environment. Kwok & Tadesse (2006) provided the mechanism of how MNCs may change the institutional environment of corruption over time. They propose three ways through which the foreign firm may have an impact on its host countries: (i) regulatory pressure effect, (ii) demonstration effect, and (iii) professionalization effect. Conversely, another group of scholars offered the contrary explanation – FDI firms are attracted to less corrupt business environments (Smarzynska & Wei, 2000; Wei, 2000; Wei & Wu, 2002; Gatti, 2004). Moreover, Goodspeed et al. (2011) also provide evidence that FDI is sensitive to host country governance measures and corruption in developing countries and developed countries, with a somewhat larger impact on developing countries.

The second strand of literature answers whether corruption motivates or restrains investment in the host country. Evidence showed that corruption harms investment in the host country (Habib & Zurawicki, 2001, 2002; Mauro, 1995; Wei & Shleifer, 2000). Hellman et al., (2002) using the enterprise performance survey of firms in transition countries found that corruption reduces FDI inflow and attract lower quality investment in term of governance standard, FDI firms even worsen the problems of corruption by paying a lower bribe than domestic firms if it suits their comparative advantages, and generates gains for them. FDI firms have the motivation to pay bribes: (i) they need to enter the industry with a high level of competition with domestic firms who understand more profound market knowledge and better local networks. (i) if an FDI-related firm's movement can significantly impact the living standards of local officials, they are engaged to pay bribes (Tanzi & Davoodi, 1998).

Until now, bribery is still a controversial issue in emerging market countries (Shleifer & Vishny, 1993; Mauro, 1995) even after OECD Anti-Bribery Convention entered into force in 1997. This is proven by the statistics and analysis of OECD report and empirical results in the literature. Although OECD Anti-Bribery Convention was effective in 1997, bribes are being paid across sectors to officials from countries at all stages of economic development. The literature reviewed that corruption might grease the wheels of trade and be accepted as common wisdom (Meon & Sekkat, 2007; Egger & Winner, 2006; Méon & Sekkat, 2005; Smarzynska & Wei, 2000; Wei, 2000)(Puck et al., 2013; Roy & Goll, 2014).

4.3 The model

In this section, we compare two frameworks. In the benchmark model, one (representative) foreign firm (nn) invests in the non-resource sector of the country (C), the natural resource sector does not exist in the economy, or the government creates some fierce barriers to prevent foreign investors in this sector. There are two (representative) foreign firms in the full model: one firm (nn) invests in the non-resource sector and the other (n) invest in the natural resource sector. In both frameworks, FDI activities are controlled by an agency of the country (C). FDI agency chooses the levels of tax (or subsidy) in both sectors. The agency also decides on the FDI project's size. In the natural resource sector, the agency requires a bribe from a foreign firm (n) to enter this sector. One explanation for that is the bargaining power of the agency is much stronger in the natural resource sector.

4.3.1 The benchmark model: FDI in the non-resource sector

First, we introduce the benchmark model with two agents: a foreign firm nn that invests in the non-resource sector of the country (C) and the agency in charge of FDIs. We assume that the non-resource sector's production does not require any scarce or specific resource; thus, the FDI agency cannot obtain any bribe from a firm nn to invest in the non-natural resource sector because, in this case, the bargaining power of governmental agency is almost zero or extremely weak.

Firm nn : Its production function is $\sqrt{k_{nn}}$. We let (p_{nn}) denote the market price of output produced by the non-resource sector, (r_{nn}) the tax-exclusive rental price of capital used in the non-resource sector, and τ_{nn} the unitary tax (or subsidy if negative) paid by the firm on each unit invested in the non-resource sector. Thus, the profit of $firm_{nn}$ in the country (C) is:

$$\pi_{nn} = p_{nn}\sqrt{k_{nn}} - (r_{nn} + \tau_{nn})k_{nn}$$

The FDI agency: The agency's revenue includes two parts: a fixed part f , and a variable part $s(r_{nn} + \tau_{nn})k_{nn}$ that is proportional to the tax-inclusive FDI inflows $(r_{nn} + \tau_{nn})k_{nn}$. Therefore, the revenue of the agency is $f + s(r_{nn} + \tau_{nn})k_{nn}$ for a given $0 < s < 1$. The agency is incentivized by the central government of the country (C) to maximize what goes to the national economy: $(r_{nn} + \tau_{nn})k_{nn}$ corresponds to the tax-inclusive payments for inputs. We refer s as the power of incentives.

The timing of the benchmark models is the following:

- (i) The governmental agency chooses the tax/subsidy level, τ_{nn} ;

- (ii) The $firm_{nn}$ and the FDI agency decide jointly the amount of FDI capital k_{nn} to invest in the non-resource sector k_{nn} .

Note that τ_{nn} could be negative. The agency could subsidize the foreign firm to attract FDI-inflows in the non-resource sector.

We solved the model by backward induction for p_{nn} and r_{nn} provided. The equilibrium value for the benchmark case is denoted with a star.

Stage 2: The governmental agency and foreign firm (nn) choose to invest the amount k_{nn} to maximize their joint revenues (“the size of the cake”). They solve:

$$\arg \max_{k_{nn}} = [f + s(r_{nn} + \tau_{nn})k_{nn}] + [p_{nn}\sqrt{k_{nn}} - (r_{nn} + \tau_{nn})k_{nn}] \quad (1)$$

$$\text{We obtain } k_{nn} = \frac{p_{nn}^2}{4(1-s)^2(r_{nn} + \tau_{nn})^2} \quad \text{and} \quad \pi_{nn} = \frac{p_{nn}^2(1-2s)}{4(1-s)^2(r_{nn} + \tau_{nn})}$$

Stage 1: The governmental agency sets the tax level τ_{nn} to maximize its revenue under budget constrain. We solve:

$$\arg \max_{\tau_{nn}} = [f + s(r_{nn} + \tau_{nn})k_{nn}] \equiv f + \frac{sp_{nn}^2}{4(1-s)^2(r_{nn} + \tau_{nn})}, \quad \text{under the budget constraint } \tau_{nn}k_{nn} \geq 0 \quad (2)$$

After solving the maximization, we can state the following proposition:

Proposition 1:

In a country where foreign firms just can enter the non-resource sector, we find $\tau_{nn}^* = 0$. It implies that the governmental agency chooses not to tax nor subsidize the FDI inflows to maximize its revenues under a budget constraint.

After calculation, we obtain the equilibrium quantity of FDI in the non-resource sector is

$$k_{nn}^* = \frac{p_{nn}^2}{4(1-s)^2 r_{nn}^2}, \quad \text{and the associated tax inclusive FDI-inflow is calculated as below:}$$

$$(r_{nn} + \tau_{nn}^*)k_{nn}^* = \frac{p_{nn}^2}{4(1-s)^2 r_{nn}} \quad (3)$$

Thus, the FDI agency chooses the lowest possible tax rate to maximize the tax-inclusive inflows of FDI $(r_{nn} + \tau_{nn}^*)k_{nn}^*$ and its revenues $f + s(r_{nn} + \tau_{nn}^*)k_{nn}^*$ ¹¹.

¹¹ Note: Without the budget constraint, the regulatory agency could choose a negative tax level (that he could choose to subsidize firm nn to increase the FDI-inflow)

4.3.2 In the full model: FDI in the non-natural resource and the natural resource sectors

In this model, we add one more agent to the benchmark model: the firm (n) that competes for a right to explore in the natural resource sector of the country (C). There are two (representative and price-taking) foreign firms that want to invest in the country (C): $firm_n$ in the resource sector and $firm_m$ in the non-resource sector¹². We assume that the natural resource sector possesses a relatively scarce or specific resource with production. This scarcity gives bargaining power to FDI agencies because $firm_n$ now tend to invest in the resource sector, and they must pay a bribe to the FDI agency for a right to invest.

Firm n . Its production function is $\lambda\sqrt{k_n}$ with $\lambda \in [0, \infty)$. We let (p_n) denote the market price of output produced by the natural resource sector, (r_n) the tax-exclusive rental price of capital used in the natural resource sector, and τ_n the unitary tax (or subsidy if negative) paid by the firm on each unit invested in the natural resource sector. Thus, the profit of the $firm_n$ in the country (C) is $p_n\lambda\sqrt{k_n} - (r_n + \tau_n)k_n$.

The FDI agency: The revenue of the agency now includes three parts: (i) a fixed part f , (ii) a variable part $s((r_m + \tau_m)k_m + (r_n + \tau_n)k_n)$ that is proportional to the tax-inclusive FDI inflows, $(r_m + \tau_m)k_m + (r_n + \tau_n)k_n$ and (iii) a bribe b paid by the $firm_n$. Therefore, the revenue of the FDI agency is $\omega = b + f + s((r_m + \tau_m)k_m + (r_n + \tau_n)k_n)$.

The timing of the full model is the following¹³:

1. The governmental agency chooses the tax/subsidy level, τ_m and τ_n ;
2. $firm_m, firm_n$, and the governmental agency decide jointly the amount of FDI, k_m and k_n with $k \in (0, \infty)$.
3. The FDI agency and $firm_n$ bargain over the bribe (b).

¹² The FDI agency know the number of firms it will deal with (in our model, one firm per sector). In this study, we do not tackle a possible competition between foreign investors.

¹³ In its structure and timing, our model is similar with the models in (Damania et al., 2004; Wilson & Damania, 2005). In these studies, the authors also deal with the issue of corruption and regulatory compliance failures, but do not address the issue of foreign investments.

We solve the model by backward induction. p_m, p_n and r_m, r_n are given. The equilibrium values for the full model are denoted with two stars.

Stage 3 (Nash Bargaining). Given the values of τ_n, τ_m, k_n, k_m , the FDI agency and firm (n) bargain over a bribe (b). If they do not reach an agreement, $firm_n$ cannot invest in this sector ($k_n = 0$). Thus, the disagreement payoffs are zero for $firm_n$ and $f + s(r_m + \tau_m)k_m$ for the FDI agency. In contrast, if they reach the agreement, $firm_n$ can invest in this sector and the payoffs are $p_n \lambda \sqrt{k_n} - (r_n + \tau_n)k_n - b$ for $firm_n$ and $b + f + s((r_m + \tau_m)k_m + (r_n + \tau_n)k_n)$ for the agency. Let $\beta \in [0, 1]$ be the bargaining power of the governmental agency and $1 - \beta$ is the bargaining power of $firm_n$. Since both agents agree on bribe, we solve the Nash bargaining calculation as follows:

$$b^{**} = \arg \max_{b \geq 0} [b + s(r_n + \tau_n)k_n]^\beta [p_n \lambda \sqrt{k_n} - (r_n + \tau_n)k_n - b]^{1-\beta} \quad (4)$$

Where $b + s(r_n + \tau_n)k_n$ and $p_n \lambda \sqrt{k_n} - (r_n + \tau_n)k_n - b$ stand for the disagreement payoffs are shared between a governmental agency and $firm_n$, respectively. We find:

$$b^{**} = \max \left\{ 0; \beta(p_n \lambda \sqrt{k_n} - (r_n + \tau_n)k_n) - (1 - \beta)s(r_n + \tau_n)k_n \right\} \quad (5)$$

Stage 2: (“Maximizing the size of the cake”), the governmental agency and foreign $firm_n$ and $firm_m$ choose physical units (k_n, k_m) to invest and maximize their joint revenues¹⁴:

$$\arg \max_{k_n, k_m} [b + f + s(r_m + \tau_m)k_m + s(r_n + \tau_n)k_n] + [p_n \lambda \sqrt{k_n} - (r_n + \tau_n)k_n - b] + [p_m \lambda \sqrt{k_m} - (r_m + \tau_m)k_m] \quad (6)$$

We find:

$$k_m^{**} = \frac{p_m^2}{4(1-s)^2(r_m + \tau_m)^2} \quad (7)$$

$$\text{and } k_n^{**} = \frac{\lambda^2 p_n^2}{4(1-s)^2(r_n + \tau_n)^2} \quad (8)$$

¹⁴ Note: FDI firm is just allowed to enter in the natural resource sector if the governmental agency and $firm_n$ reach the agreement and accept on bribe (b) at stage 3.

$$\pi_{mn}^{**} = \frac{p_{mn}^2(1-2s)}{4(1-s)^2(r_{mn} + \tau_{mn})} \text{ and } \pi_n^{**} = \frac{\lambda^2 p_n^2(1-2s)}{4(1-s)^2(r_n + \tau_n)}$$

Plugging the values of k_{mn}^{**}, k_n^{**} in the equation (5), we find:

$$b^{**} = \begin{cases} 0 & \text{if } s \geq \frac{\beta}{1+\beta} \\ \beta(p_n \lambda \sqrt{k_n} - (r_n + \tau_n)k_n) - (1-\beta)s(r_n + \tau_n)k_n & \text{if } s < \frac{\beta}{1+\beta} \end{cases} \quad (9)$$

When the agency in charge of FDI has almost zero or weak bargaining power (that is, when β and $\frac{\beta}{1+\beta}$ are weak) or the agency is sufficiently incentivized by the central government (when s is sufficiently high), corruption does not exist. Therefore, a weak bargaining power prevents the agency in charge of FDI obtain a bribe from $firm_n$. Whereas high power of incentives motivates the agency to maximize the tax-inclusive FDI inflow $(r_{mn} + \tau_{mn})k_{mn} + (r_n + \tau_n)k_n$, thus reducing bribery¹⁵.

Stage 1: (Choice of taxes/subsidies). The FDI agency chooses the tax level τ_n and τ_{mn} to maximize its revenue under the budget constraint by solving:

$$\arg \max_{\tau_n, \tau_{mn}} [b^{**} + f + s(r_{mn} + \tau_{mn})k_{mn}^{**} + s(r_n + \tau_n)k_n^{**}] \quad (5) \text{ subject to } \tau_{mn}k_{mn}^{**} + \tau_n k_n^{**} \geq 0$$

Where $b^{**}, k_n^{**}, k_{mn}^{**}$ are given by equations (9), (8), and (7), we solve the maximization program in Appendix 4.1, and we find the following proposition.

Proposition 2: Consider a country where FDI takes place in the non-resource and the resource sector, We have two cases:

- (1) When $s \geq \frac{\beta}{1+\beta}$ we have $\tau_{mn}^* = 0$ and $\tau_n^* = 0$. In this case, the governmental agency is sufficiently incentivized or has a weak bargaining power related to $firm_n$, they choose zero tax.

¹⁵ We would have the same results if instead of the three agents summarized by the expression (6), the FDI agency made two separate decisions to choose the foreign investments levels: A shared decision with $firm_{mn}$ to choose k_{mn} to maximize $(f + s(r_{mn} + \tau_{mn})k_{mn}) + (p_{mn} \sqrt{k_{mn}} - (r_{mn} + \tau_{mn})k_{mn})$ and another shared decision with $firm_n$ to choose k_n to maximize $(b + s(r_n + \tau_n)k_n) + (p_n \lambda \sqrt{k_n} - (r_n + \tau_n)k_n - b)$. This due to the fact that there is no technological spillovers between the two sectors.

(2) When $s < \frac{\beta}{1+\beta}$ we have:

$$\tau_{nn}^{**} = \frac{2r_m}{1 + \sqrt{\frac{1+\xi}{1+\beta^2\left(\frac{1-s}{s}\right)^2\xi}}} - r_m \text{ and}$$

$$\tau_n^{**} = \frac{2r_n}{1 + \sqrt{\frac{1+\xi}{\left(\frac{1}{\beta}\right)^2\left(\frac{s}{1-s}\right)^2 + \xi}}} - r_n$$

Where $\xi = \frac{\lambda^2 p_n^2 / r_m}{p_m^2 / r_n}$ ¹⁶, we have:

1. $\tau_n^{**} < 0$ and $\tau_m^{**} > 0$: the FDI agency subsidizes the investment made by the *firm_n* and charges taxes on the investment made by the *firm_m*.
2. τ_n^{**} is increasing in s and decreasing in ξ ; τ_m^{**} is decreasing in s and decreasing in ξ .

Proposition 2 states that if the FDI agency has a weak bargaining power or more incentives received from the central government, the agency sets zero tax level. Weak bargaining power of the agency and high power of incentives make bribery difficult to implement or non-profitable for the agency, and in this case, by setting nil taxes, the agency maximizes the total FDI inflows and, therefore, its payoff. This is a direct generalization of the case we studied in the benchmark model when foreign firms only invest in the non-resource sector.

When the agency's bargaining power β over *firm_n* is strong or the power of incentive received from central government s is small, the governmental agency has the motivation to receive bribe thus, corruption exists; and in this case, the agency chooses to distort the fiscal policy on FDI by taxing the non-resource *firm_m* and subsidizing the resource *firm_n*. Moreover, by subsidizing FDI inflows in the natural resource sector, the agency promotes *firm_n* to invest more and also accept a higher bribe, a positive tax on *firm_m* allows to keep the agency's budget balanced. Our findings

¹⁶ One can easily verify that the solution $(\tau_m^{**}, \tau_n^{**})$ is continuous at point $s = \frac{\beta}{1+\beta}$.

prove that the fiscal distortion diminishes as an increase in the power of incentives s : τ_m^{**} decreases while τ_n^{**} increases with s . The tax rate (τ_m^{**} and τ_n^{**}) becomes zero when s is equal to $\frac{\beta}{1+\beta}$ and the fiscal distortion disappears. The term ξ is the ratio comparing profitability in two sectors: (i) $\xi > 1$ means profitability is higher in the resource sector than the non-resource sector, $\xi \leq 1$ means profitability is higher in the non-resource sector than the natural resource sector.

The equilibrium quantity of FDIs for both sectors can be calculated as:

$$k_m^{**} = \begin{cases} \frac{\rho_m^2}{4(1-s)^2 r_m^2} & \text{if } s \geq \frac{\beta}{1+\beta} \\ \frac{\rho_m^2}{16(1-s)^2 r_m^2} \left(1 + \sqrt{\frac{1+\xi}{1+\beta^2 \left(\frac{1-s}{s}\right)^2 \xi}} \right)^2 & \text{if } s < \frac{\beta}{1+\beta} \end{cases}$$

$$k_n^{**} = \begin{cases} \frac{\rho_n^2}{16(1-s)^2 r_n^2} \left(1 + \sqrt{\frac{1+\xi}{\left(\frac{1}{\beta}\right)^2 \left(\frac{s}{1-s}\right)^2 + \xi}} \right)^2 & \text{if } s \geq \frac{\beta}{1+\beta} \\ \frac{\rho_n^2}{4(1-s)^2 r_n^2} & \text{if } s < \frac{\beta}{1+\beta} \end{cases}$$

Where $\xi \equiv \frac{\lambda^2 \rho_n^2 / r_{nn}}{\rho_m^2 / r_n}$, the tax inclusive inflows of FDIs in the non-resource sector are

$(r_m + \tau_m^{**})k_m^{**}$ and the total FDI inflows are $(r_m + \tau_m^{**})k_m^{**} + (r_n + \tau_n^{**})k_n^{**}$. We now compare the FDI invested in the non-resource sector without or with the natural resource.

Proposition 3:

Consider the case where $s \geq \frac{\beta}{1+\beta}$. Then we have $k_{nn}^{**} = k_n^{**}$ and the FDI inflow in the non-resource sector is the same whether there are natural resources or not in the country (C). Consider the case where $s < \frac{\beta}{1+\beta}$ then we have: The quantity invested by $firm_{nn}$ in the country (C) is smaller when there is a resource sector in the economy. Furthermore, we also have $(r_{nn} + \tau_{nn}^{**})k_{nn}^{**} < (r_{nn} + \tau_{nn}^*)k_{nn}^*$: The FDI inflow in the non-resource sector is smaller when there are natural resources in the economy.

Proof: Appendix 2.

Proposition 3 is a consequence of proposition 2. When the governmental agency has a weak bargaining power relative to $firm_n$ or when they are offered high power of incentives from the central government, the tax rate is equal between the benchmark and full model: we have $\tau_{nn}^* = \tau_{nn}^{**} = 0$. The consequence is that $k_{nn}^* = k_{nn}^{**}$. Conversely, when the bargaining power of the governmental agency is strong, or the power of incentive offered is low, the foreign $firm_{nn}$ faces a higher tax rate in the full model than in the benchmark model. We have $\tau_{nn}^* < \tau_{nn}^{**}$ and $k_{nn}^{**} = k_{nn}^*$. Next, we compare the total FDI inflows into the country (C) without or with natural resources. Let define

$$\phi(\beta, s) = \frac{(\beta^2 + 2\beta - 3)s^2 - (2\beta^2 + 2\beta)s + \beta^2}{(3\beta^2 - 2\beta - 1)s^2 - (6\beta^2 + 2\beta)s + 3\beta^2}. \text{ The following proposition summarizes as follows:}$$

Proposition 4:

First, we consider the case where $s < \frac{\beta}{1+\beta}$:

If $\xi < \phi(\beta, s)$, a resource curse appears in the sense that:

$$(r_{nn} + \tau_{nn}^{**})k_{nn}^{**} + (r_n + \tau_n^{**})k_n^{**} < (r_{nn} + \tau_{nn}^*)k_{nn}^* : \text{ Total tax inclusive Fdi inflows are smaller when there is a resource sector in the economy.}$$

If $\xi \geq \phi(\beta, s)$, there is no resource curse and total tax inclusive FDI inflows increase when there is a resource sector in the economy: $(r_{nn} + \tau_{nn}^{**})k_{nn}^{**} + (r_n + \tau_n^{**})k_n^{**} \geq (r_{nn} + \tau_{nn}^*)k_{nn}^*$:

Next, we consider the case where $s \geq \frac{\beta}{1+\beta}$:

we have $(r_m + \tau_m^{**})k_m^{**} + (r_n + \tau_n^{**})k_n^{**} \geq (r_m + \tau_m^*)k_m^*$: total tax inclusive FDI inflows are larger when there is a resource sector in the economy.

Proof: Appendix 3.

The expression (9) states that when $s < \frac{\beta}{1+\beta}$, the FDI-agency has strong bargaining power over $firm_n$ or received a weak power of incentives from the central government, that motivates them to obtain bribes through a distorted fiscal policy. In our framework, the distorted fiscal policy is a necessary but not sufficient condition to justify the natural resource curse. If the natural resource sector is sufficiently “profitable” compared to the non-resource sector (that is if $\xi \geq \phi(\beta, s)$) then there is no resource curse on FDI: the total FDI inflows are above these of the benchmark model because both foreign firms will invest sufficiently in the country (C) despite the distorted fiscal scheme. If the resource sector is not sufficiently “profitable” compared to the non-resource sector (that is if $\xi < \phi(\beta, s)$), then the total FDI inflows are below those of the benchmark model because the distorted fiscal scheme makes the foreign $firm_{nn}$ invests less than the benchmark model $(r_m + \tau_m^{**})k_m^{**} < (r_m + \tau_m^*)k_m^*$, a loss that is not compensated in this case by the low investment of the insufficiently profitable $firm_n$.

The following figures represent the three areas defined in proposition 4 in the space (s, ξ) for different values of β (that is, different bargaining power of the governmental agency and $firm_n$).

Area A1 corresponds to the case when $s < \frac{\beta}{1+\beta}$ and $\xi < \phi(\beta, s)$, that is the values of (s, ξ) for which

the distortion and a resource curse¹⁷. Area A2 relates to the case where $s < \frac{\beta}{1+\beta}$ and $\xi \geq \phi(\beta, s)$,

that is the values of (s, ξ) for which there is a fiscal distortion but no resource curse. Area A3

corresponds to the case where $s \geq \frac{\beta}{1+\beta}$ that is the values (s, ξ) for which there is no fiscal distortion

and no resource curse. Figure 4.1 (1) displays the case $\beta = 0$; the FDI agency has no bargaining power at all over $firm_n$ and hence cannot constraint this firm to pay any level of bribe.

¹⁷ Note: Condition $\xi < \phi(\beta, s)$ implies condition $s < \frac{\beta}{1+\beta}$ because for any $\beta \in [0, 1]$, $\phi(\beta, \frac{\beta}{1+\beta}) < 0$.

The consequence is that the agency has no incentive to distort the fiscal policy to facilitate corruption. Figure 4.1 (2), (3), (4) show that when there is an increase in the levels of bargaining power of the governmental agency: $\beta = 0.25$, $\beta = 0.5$ and $\beta = 1$. As β increases, the size of areas A1 and A2 increase, which means that corruption and a distorted fiscal policy take place for more and more values (s, ξ) . In contrast, the size of area A3 decrease, the central government should set a higher value of s if it wishes to tackle the problem of corruption. The graph shows that by increasing the power of incentives, s , it is possible to partly or fully remedy the resource curse.

Our findings suggest an essential policy implication about the effect of a more stringent anti-bribery policy impulsed by the central government. In the model, such a more stringent anti-bribery policy reduces the bargaining power of the FDI agency over $firm_n$ as it becomes riskier for this FDI agency to engage in bribery. The consequence is the area A3 of parameters (s, ξ) in which there is no fiscal distortion, and no corruption will appear.

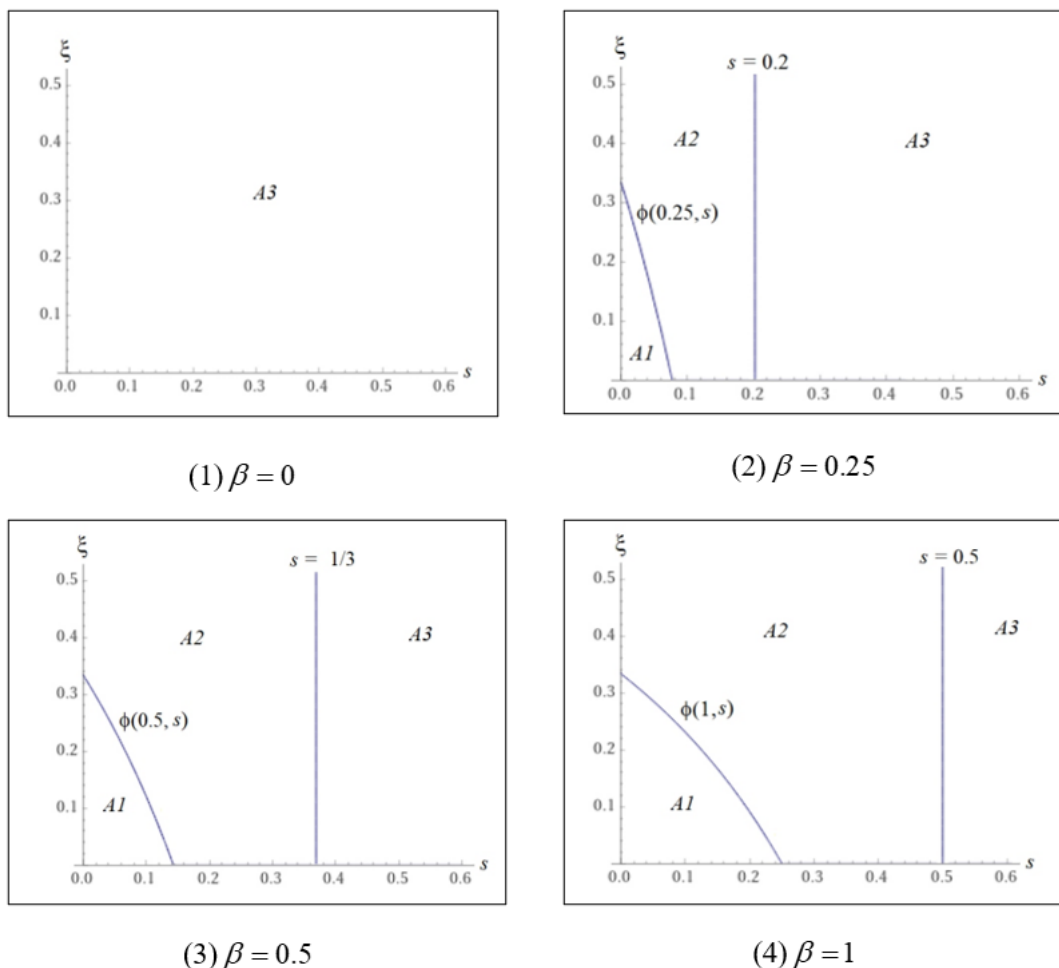


Figure 4.1

4.4 Choice by the target state of the optimal system to incentivize the FDI agency

4.4.1 Endogenous choice of the power of incentives, s^*

Until now, we have a reason for a given incentive scheme (f, s) set by the government. We have shown that if the government chooses a sufficient power of incentives s , it is possible to prevent corruption and solve the resource curse on FDI. In this case, a natural question arises: why does the central government choose not to increase the power of incentive above level $\frac{\beta}{1+\beta}$ to escape from the curse? The objective of this section is not to provide a complete answer to this question but propose a possible explanation. We suggest that the central government may not choose a high power of incentive because the cost of providing incentives to the FDI agency is simply too high due to a shadow cost of public funds. To understand why to suppose the objective of the central government is to choose the incentive scheme (f, s) that maximizes its surplus function given by:

$$\gamma[(r_m + \tau_m^{**})k_m^{**} + (r_n + \tau_n^{**})k_n^{**}] - (1 + \mu)[s((r_m + \tau_m^{**})k_m^{**} + (r_n + \tau_n^{**})k_n^{**}) + f]$$

The left-hand side of the expression is the gross surplus. The term $\gamma \in (0, 1]$ is the monetary value the government attaches to one dollar of the FDI inflows and $(r_m + \tau_m^{**})k_m^{**} + (r_n + \tau_n^{**})k_n^{**}$ constitutes the total FDI inflows. The right-hand side of the expression includes the cost for the government of running the FDI agency. We assume there is a shadow cost of public funds, which is a loss μ incurred by the central government for each dollar raised to finance government spending due to the distortion caused by taxation. Laffont (2005) estimates that μ is around 0.3 in developed countries and more than 1 in developing countries. Other authors estimate the shadow cost of public funds is even higher. We do not solve the general maximization problem of the central government but only consider a particular example that allows illustrating how the choice s is made how this choice is impacted and constrained by the existence of the shadow cost of public funds. We consider the case where $p_m = p_n = 2$, $r_m = r_n = 1$ and $\lambda = \sqrt{0.1} \approx 0.316$, so that $\xi = 0.1$.

Furthermore, the bargaining power of the FDI agency is $\beta = 0.5$. We calculate the optimal s^* numerically for different values μ and obtain Table 4.1. In Table 4.1, Column BM stands for benchmark model, and FM stands for the full model.

Table 4.1: Optimal value of s^* and FDI inflows for different values of μ

$(1 + \mu) / \gamma$	1.3		1.6		2		3		5	
	BM	FM	BM	FM	BM	FM	BM	FM	BM	FM
s^*, s^{**}	0.538	0.538	0.25	0.272	0	0.169	0	0.093	0	0.03
τ_m^*, τ_m^{**}	0	0	0	0.017	0	0.094	0	0.273	0	0.665

τ_n^*, τ_n^{**}	NA	0	NA	-0.128	NA	-0.341	NA	-0.471	NA	-0.53
$\tau_{nn}^{**} - \tau_n^{**}$	NA	0	NA	0.145	NA	0.437	NA	0.744	NA	1.195
nn FDI inflow	4.685	4.685	1.778	1.843	1.02	1.323	1.02	0.954	1.00	0.638
n FDI inflow	NA	0.468	NA	0.216	NA	0.22	NA	0.23	NA	0.226
Total FDI inflow	4.685	5.153	1.778	2.059	1.02	1.543	1.02	1.184	1.00	0.864
Bribe b^*	NA	0	NA	0.021	NA	0.054	NA	0.083	NA	0.103
Bribe (%)	NA	0	NA	9.2	NA	24.6	NA	36.0	NA	45.5

Note: NA = not applicable

In table 4.1, the line $\tau_{nn}^{**} - \tau_n^{**}$ measures the degree of fiscal distortions. The line Bribe (%) is the bribe expressed relatively to the FDI inflow in the resource sector: For example, $9.2 = 0.021 / 0.216 * 100$. The case where $(1 + \mu) / \gamma = 1.3$ corresponds to a country with a very low shadow cost of public funds (e.g. $\mu = 0.3$) and where FDI inflows are highly valued by the central government relative to the cost of running the FDI agency (e.g. $\gamma = 1$). The cases $\mu = 1.6$, $\mu = 2$, $\mu = 3$, and $\mu = 5$ correspond to situations where the shadow cost of public funds becomes increasingly higher and/or FDI inflows become less and less valued by the government relative to their cost. Higher $(1 + \mu) / \gamma$, the higher the relative cost for the government to incentivize the FDI agency correctly.

When $(1 + \mu) / \gamma = 0.3$ the relative cost of providing incentives to the FDI agency is quite low for the central government and in the full model with the two sectors, the government can set the high $s^{**} = 0.538$ to incentivize the FDI agency to focus on the total FDI inflow. In turn, the FDI agency does not distort the tax system, and there is no bribery. There is not FDI resource curse. When $(1 + \mu) / \gamma = 1.6$, $(1 + \mu) / \gamma = 2$, $(1 + \mu) / \gamma = 3$ the relative cost of providing incentives to the FDI agency increases, the central government has to set lower powers of incentives s^{**} than for $(1 + \mu) / \gamma = 1.3$. The consequence is that bribery takes place and the FDI agency distorts the tax system to obtain a higher bribe¹⁸. In each of the three cases, s^{**} is higher in the full model with the two sectors than in the benchmark model because in the full model the government tries to limit the distortion level of the fiscal system with a higher power of incentives. In the three cases, the relatively large levels of s^{**} and the differences between s^* and s^{**} explain that there is no FDI-resource curse.

When $(1 + \mu) / \gamma = 5$ the cost of providing incentives becomes very high, the central government has to set a very lower power of incentives s^{**} . The consequence is that bribery increases,

¹⁸ Note that as $(1 + \mu) / \gamma$ increases, the bribe increases (in absolute and relative value) and fiscal scheme becomes more and more distorted: $\tau_{nn}^{**} - \tau_n^{**}$ increases.

and the FDI agency distort the tax system even more. The high fiscal distortion implies the existence of an FDI resource curse.

So far, we have dealt with the case where the FDI agency has a relative autonomy relative to the central government and pursue its objective, which is to maximize $b + f + s((r_m + \tau_m^{**})k_m^{**} + (r_n + \tau_n^{**})k_n^{**})$. We can also consider the case where the FDI agency and the central government constitute the same agent whose objective could maximize a surplus equal $b + s((r_m + \tau_m^{**})k_m^{**} + (r_n + \tau_n^{**})k_n^{**})$, for a given s in $[0,1]$. In this case, s should not be interpreted as the power of incentives but rather as a parameter describing the preferences of the central government. Here s is the weight the central government attaches to one monetary unit of FDI inflows in its surplus function.

4.4.2 The case where the FDI agency and the government are a unique agent

So far, we have dealt with the case of decentralized¹⁹ countries where the FDI agency has a relative autonomy relative to the central government and pursues its objective, which is to maximize:

$$b + f + s((r_m + \tau_m^{**})k_m^{**} + (r_n + \tau_n^{**})k_n^{**})$$

We can also consider the case where the FDI agency and the central government constitute the same agent whose objective could maximize a surplus equal to $b + s((r_m + \tau_m^{**})k_m^{**} + (r_n + \tau_n^{**})k_n^{**})$, for a given s in $[0,1]$. In this case, the term s should not be interpreted as the power of incentives, but rather as an exogenous parameter describing the preferences of the central government: s can be interpreted as the weight that the central government attaches to one monetary unit of FDI inflows in its surplus function, compared to one monetary unit of bribe. Typically, the central government attaches less importance to FDI inflows (indirect long-term benefit) than local government because they do not constitute the bribe payment (direct short-term benefit), but rather an objective to consider when setting taxes: $s \leq 1$. The government of a developing country is probably characterized by a lower s than the government of a developed country²⁰ because the former has less and potentially more irregular sources of revenues. With the interpretation, one can use Figure 4.1 to know if there

¹⁹ Decentralization related to the design and implementation of a multi-level system of government in which the central government transfer power and responsibility and distribute the public resources to the local government, thereby bringing about more efficient, freely, and adapt appropriate policies to local preferences.

²⁰ Norway is a good example for the case of a rich resource country but does not suffer from the curse of natural resources. The first explanation could be due to the high institutional quality and its anti-bribery policy. A second explanation is a Norwegian society aims to a sustainable welfare state for future generations, they safeguard resources which reflect through the growing oil fund. This recommends that Norway has: high value of s (in the context of *Section 4.4.2*) or a low value of $(1 + \mu) / \gamma$ (in the context of *Section 4.4.1*)

is a fiscal distortion, bribery and FDI resource curse (area A1), fiscal distortion and bribery without FDI-resource curse (area A2), or no fiscal distortion, no bribery and no FDI-resource curse (area A3).

4.4.3 Effects of an anti-bribery policy

Interestingly, it is also possible to examine the effect of a more stringent anti-bribery policy impulsed by the central government. This type of policy replaces or complements the policies based on incentives. There is no variable reflecting the possible penalties the FDI agency incurs when accepting a bribe in our framework. Nevertheless, a simple and natural way to examine the effect of an anti-bribery policy is to assume that such a policy induces a decrease of β , the bargaining power of the FDI agency over $firm_n$. The reason is that the anti-bribery policy makes it riskier for the FDI agency to engage in bribery, which is known by the foreign firm active in the resource sector. The consequence of the smaller β is that the area A3 of parameters (s, ξ) in which there is no fiscal distortion or corruption become larger while area A1 and A2 become smaller: there is less room for bribery, and the FDI resource curse become less common.

4.5 Conclusion

Our study attempts to provide an alternative explanation to a longstanding resource curse puzzle by providing a new mechanism that explains why and when an FDI-resource curse can appear in a country. Our findings show that when a country has no natural resources, bribery is not available, and in this case, the optimal choice for an FDI agency is not to tax nor to subsidize the FDI in the non-resource sector. On the other side, when the resource sector exists in the economy, bribe becomes available in the resource sector. The stronger bargaining power of the FDI agency over foreign investors in the resource sector or the smaller power of incentives allocated from the central government in the resource sector allows the FDI agency to optimize its payoffs by taxing non-resource firms subsidizing the resource firms to accept the higher bribe. These findings are consistent with the empirical results in developing countries; incentives on FDI are often positively related to corruption (Christiansen et al., 2003). The results also shed light on the resource curse is only exists after a certain threshold point of institutional quality has been reached. In detail, countries with low institutional quality depend heavily on natural resources while ones with high institutional quality are less dependent on natural resources.

Our framework raises a question to the policymakers that can have some insight implications: Why does the central government choose not to increase the power of incentives to escape from the resource curse? What form should, for example, which level of incentives offered to FDI-agency take? Of course, there is no generally valid “best” solution to this problem. An explanation for this

issue is that the central government may not choose a high power of incentive due to the high cost of providing incentives. It is considered a high shadow cost of public funds. On balance, resource-based development is possible, but it remains a challenge for poor or developing countries due to budget constraints.

This study does not provide a complete answer to this question, but we propose a replacement or complements to the policy based on incentives. We suggest that the central government can pursue a stringent anti-bribery policy. In the scope of this study, we don't consider the possible penalties of FDI agencies for accepting a bribe (Damania et al., 2004; Wilson & Damania, 2005). To investigate the effect of anti-bribery policy, we can assume a decrease in the bargaining power of FDI agency over the foreign firm in the resource sector, which leads to less motivated FDI agency with obtaining bribes due to more risk. Thus, there is no fiscal distortion, corruption, and possibility for the FDI – resource curse. In practical terms, a possible way to decrease the bargaining power of the FDI agency in the resource is to increase transparency and/or penalize more severe corruption both on the side of the FDI emitters; and the FDI receivers. These more stringent anti-bribery policies have been put in place in 1997 by the OECD but should be generalized to a greater number of countries.

Appendices

Appendix 1

We consider the case where $s \geq \frac{\beta}{1+\beta}$, $b^{**} = 0$ and the FDI agency solves:

$$\arg \max_{\tau_n, \tau_m} f + s(r_n + \tau_n)k_n^{**} + s(r_m + \tau_m)k_m^{**} \text{ subject to } \tau_n k_n^{**} + \tau_m k_m^{**} \geq 0 \quad (10)$$

By plugging (8) and (7) in expression (10), we have $\tau_n = 0$ and $\tau_m = 0$

We consider the case where $s < \frac{\beta}{1+\beta}$. Using the results of stages 2 and 3, this is equivalent to

$$\arg \max_{\tau_n, \tau_m} \beta(\rho_n \lambda \sqrt{k_n^{**}} - (1-s)(r_n + \tau_n)k_n^{**}) + s(r_m + \tau_m)k_m^{**} + f \text{ subject to } \tau_n k_n^{**} + \tau_m k_m^{**} \geq 0$$

Or, after simplification, to

$$\arg \max_{\tau_n, \tau_m} \beta \left(\frac{\lambda \rho_n}{\rho_m} \right)^2 \frac{1}{r_n + \tau_n} + \frac{s}{1-s} \cdot \frac{1}{r_m + \tau_m} \text{ subject to } \left(\frac{\lambda \rho_n}{\rho_m} \right)^2 \frac{\tau_n}{(r_n + \tau_n)^2} + \frac{\tau_m}{(r_m + \tau_m)^2}$$

We make a change of variables and define $X = \frac{1}{r_n + \tau_n}$ and $Y = \frac{1}{r_m + \tau_m}$. We can write $\tau_n = \frac{1}{X} - r_n$

and $\tau_m = \frac{1}{Y} - r_m$. The maximization program becomes:

$$\arg \max_{\tau_n, \tau_m} \beta \left(\frac{\lambda \rho_n}{\rho_m} \right)^2 X + \frac{s}{1-s} Y$$

$$\text{subject to } \left(\frac{\lambda \rho_n}{\rho_m} \right)^2 (X - r_n X^2) + (Y - r_m Y^2) \geq 0$$

The slope of the objective function in (X,Y) space is

$$\frac{dY}{dX} \Big|_{obj} = -\frac{1-s}{s} \left(\frac{\lambda \rho_n}{\rho_m} \right)^2$$

The slope along the constraint is

$$\frac{dY}{dX} \Big|_{const} = -\frac{1-2r_n X}{1-2r_m Y} \left(\frac{\lambda \rho_n}{\rho_m} \right)^2$$

At the maximum we must have:

$$\left\{ \begin{array}{l} \frac{dY}{dX} \Big|_{obj} = \frac{dY}{dX} \Big|_{const} \\ \left(\frac{\lambda \rho_n}{\rho_{nn}} \right)^2 X^2 \left(\frac{1}{X} - r_n \right) + Y^2 \left(\frac{1}{Y} - r_{nn} \right) = 0 \end{array} \right\}$$

After solving the system, we find:

$$X = \frac{1}{2r_n} \left(1 + \sqrt{\frac{1+\xi}{\left(\frac{s}{1-s}\right)^2 + \xi}} \right) \text{ and}$$

$$Y = \frac{1}{2r_{nn}} \left(1 + \sqrt{\frac{1+\xi}{\left(\frac{1-s}{s}\right)^2 \xi}} \right)$$

Where $\xi \equiv \frac{\lambda^2 \rho_n^2 / r_n}{\rho_{nn}^2 / r_{nn}}$. We find the expression of the text by using the fact that $\tau_n = \frac{1}{X} - r_n$ and

$$\tau_{nn} = \frac{1}{Y} - r_{nn}.$$

Appendix 2. Consider the case where $s < \frac{\beta}{1+\beta}$, we obtain:

$$k_{nn}^{**} = \frac{p_{nn}^2}{16(1-s)^2 r_{nn}^2} \left(1 + \sqrt{\frac{1+\xi}{1+\beta^2 \left(\frac{1-s}{s}\right)^2 \xi}} \right)^2 < k_{nn}^* = \frac{p_{nn}^2}{4(1-s)^2 r_{nn}^2}$$

because $s < \frac{\beta}{1+\beta}$ means that $\beta^2 \left(\frac{1-s}{s}\right)^2 > 1$.

For some reason, we also have:

$$(r_{nn} + \tau_{nn}^{**})k_{nn}^{**} = \frac{p_{nn}^2}{8(1-s)^2 r_{nn}} \left(1 + \sqrt{\frac{1+\xi}{1+\beta^2 \left(\frac{1-s}{s}\right)^2 \xi}} \right) < (r_{nn} + \tau_{nn}^*)k_{nn}^* = \frac{p_{nn}^2}{4(1-s)^2 r_{nn}}.$$

Appendix 3. To consider the case where $s < \frac{\beta}{1+\beta}$. By solving

$$\frac{\rho_{mn}^2}{4(1-s)^2 r_{mn}} > \frac{1}{8(1-s)^2} \left(1 + \sqrt{\frac{1+\xi}{\left(\frac{1}{\beta}\right)^2 \left(\frac{s}{1-s}\right)^2 + \xi}}\right) \frac{\lambda^2 \rho_n^2}{r_n} + \frac{1}{8(1-s)^2} \left(1 + \sqrt{\frac{1+\xi}{1 + \beta^2 \left(\frac{1-s}{s}\right)^2 \xi}}\right) \frac{\rho_{mn}^2}{r_{mn}}, \text{ we find}$$

$$\xi \equiv \frac{\lambda^2 \rho_n^2 / r_n}{\rho_{mn}^2 / r_{mn}} < \frac{(\beta^2 + 2\beta - 3)s^2 - (2\beta^2 + 2\beta)s + \beta^2}{(3\beta^2 - 2\beta - 1)s^2 - (6\beta^2 - 2\beta)s + 3\beta^2}$$

CHAPTER 5: CONCLUDING CHAPTER

This chapter summarizes the significant findings of the thesis, policy implications, study limitations, and possible future research areas. The empirical results throughout all our analyses gave answers to the questions initially asked in the introduction chapter related to how economic growth has been achieved, the role of FDI, and other spillovers in this process. The first research question is whether FDI boosts the firm's productivity in the same region. The second research question analyses how FDI agglomeration, geography, and local governance quality affect provincial productivity. The third research question related to explaining the FDI-natural resource curse by considering corruption and fiscal policy.

The main results of this thesis can be summarised as follows:

5.1 Main findings

Chapter 2 reported that the firm's productivity is influenced by internal factors such as ownership type and external factors such as unexpected change of market (industrial factors) and business environment (regional factors). Firstly, we confirm the impacts of FDI presence in a region on the total factor productivity of domestic firms. The results show that FDI spillover negatively impacts a firm's productivity in the same region. Secondly, considering the firm's size, foreign ownership, and state ownership, our finding confirms that FDI-related firms, state-owned firms, and large firms are more productive. Thirdly, DID method helps us to compare FDI effects between long-lived firms (firms established before FDI enter in a region) and younger firms (firms established after FDI enter in a region). By analyzing two groups of firms for two periods (post and pre-treatment period), empirical results reveal that firms established before FDI enter a region will have higher productivity than younger ones. Primarily, we also provide a regional-based region regression for the northern, central, and southern zone, and we find that FDI spillover significantly affects the firm's productivity in the northern and southern zone but has no impact on the central zone of Vietnam.

Chapter 3 shows an empirical assessment of provincial TFP by analyzing the role of FDI agglomeration effect, regional factors, and business environment quality within a particular province and neighbor provinces for 2010 - 2017. Using a spatial Durbin model, we provide a systematic overview of each determinant's direct and indirect effects in the short-run and long run. The results show a mixed picture; for example, market size and demand positively affect regional TFP while wage level has an adverse impact. Although the agglomeration effect is widely believed to have a significant and positive effect on FDI location choice, our results confirmed that heterogeneous firms might benefit from FDI agglomeration effects differently in the various province. Because of the efforts of local government to attract FDI, these provinces will benefit from better infrastructure and

higher local governance quality that will lead to an increase in provincial TFP. The local government is responsible for creating a favorable environment for foreign investment and providing significant incentives to attract FDI. Therefore, provincial TFP is only high at FDI location choice due to the crowding-out effect, and local firms cannot enter the industry and compete with FDI-related firms in the same province. Primarily, we criticize some indicators of the Provincial Competitiveness Index and investigate which determinants change the productivity of a particular area and nearby regions. By analyzing each specific component of PCI, we better understand that not always improving the quality of local governance can improve the provincial TFP of local firms. We found that some factors do not change the provincial TFP in this province but externalize negative impacts on neighboring regions. Some PCI indicators may not affect regional TFP in the short term but only in the long term. Even some of the aspects of PCI cause negative impacts to the neighboring province; a possible reason is that the technological monopolies of FDI-related firms and competition effects of foreign countries crowd out local firms in the same region.

Chapter 4 proposed a different explanation of the natural resource curse by a model with corruption and fiscal policy. By comparing two frameworks: a benchmark model with no natural resources in the target country and a full model with a natural resource's presence, our findings confirmed that bribery only exists when the target country has natural resources. It is optimal for the agency in charge of FDI to tax the foreign investments invested in the non-resource sector and subsidize the natural resource sector. The FDI agency distorts the tax system to motivate more foreign investment in the natural resource sector and reclaim a higher bribe. The negative counterpart is that the foreign investment in the non-resource sector decreases relative to the benchmark case. Moreover, our framework shows that when foreign firms in the natural resource sector are not productive and when the FDI agency is not very incentivized by the central government, the total FDI inflows in the economy in which the natural resource sector is present are smaller than one without natural resource sector: there is an FDI-natural resource curse. These findings also show that the FDI-resource curse only exists after a certain threshold point of institutional quality has been reached. In detail, countries with low institutional quality depend heavily on natural resources while ones with high institutional quality are less dependent on natural resources.

5.2 Contributions

We believe that this dissertation can contribute to the FDI literature both theoretical and empirical results at multi-levels.

First, although the topic of FDI and productivity nexus has been discussed for a long period, due to the lack and difficulties accessing detailed information at the firm level, all empirical studies exploit the FDI-productivity relationship at the national or provincial level. Thus, it's hard for

researchers to have a systematic picture of global FDI and compare the difference in different economies or countries, especially developing countries. According to World Investment Report, the three areas that attract the most FDI inflows are Africa, Latin America, Asia, and Oceania. In recent years, Asia has been the top leading of announced greenfield projects in manufacturing. Possessing intensive information about 123,400 domestic manufacturing firms allows me to provide empirical evidence of the Vietnam context – an interesting case study of a developing country.

Unlike the other studies, in chapter 2, we investigate the effect of FDI presence on local firm's productivity by applying the difference in difference (DID) method. To the best of our knowledge, the DID method is commonly applied to evaluate the impact of policies but has not been used to examine the effects of FDI presence on the productivity of domestic firms. By separating our large sample into two groups (firms established before and after FDI enters into a region), we explore whether the impact of FDI presence on the firm's productivity differs from the history of FDI in an area and found evidence of the variation of FDI spillover effects between long-live firms and younger firms.

Previous literature shows that FDI spillover effects are not uniform depending on the absorptive capacity of domestic firms. Due to the large sample with various types of ownership, it helps us clarify the ownership factor that influences the results that domestic firms gain or lose from the presence of FDI in their domestic markets. Chapter 2 also fills gaps in the empirical literature on Vietnam and provides evidence that ownership type impacts the relationship between FDI spillover effects and productivity.

The analysis of Chapter 2 shows that the presence of FDI creates a positive spillover effect for domestic enterprises in the same region, which shows that the host country needs to consider measures to encourage FDI inflows in the different areas. However, the characteristics of the business investment environment vary from region to region, leading to the uneven distribution of FDI-inflows in Vietnam; most FDI projects are concentrated in very few provinces. Besides upgrading infrastructure in the province, local government also improves the local governance quality. Thus, a question raised is whether a firm enters into a region with a higher development level, better local governance quality, and the FDI presence can experience higher productivity. In Chapter 3, using the spatial econometric model and weight matrix of FDI location and neighborhood allows us to provide robust support for investigating how a place with a high level of FDI concentration could externalize its agglomeration effects to a region also spillovers to the nearby areas. Moreover, we have contributed to the existing literature by comparing the direct and indirect effects for the regional determinants and local governance quality indicators that affect provincial TFP of the province with FDI concentration both in the short-run and long run.

Most of the studies in Vietnam used the PCI index to investigate the effects of local governance quality in the region on the productivity of local firms. But PCI is an aggregate indicator measured by different dimensions, so analyzing each component in this index will provide strong implications to local authorities because not all factors positively affect firms in this region. To the best of our knowledge, this is one of the first attempts using sub-dimensions of PCI to analyze the impact of local governance quality on provincial productivity in Vietnam.

Finally, compelling empirical literature exists on FDI; it must be highlighted that lacking studies related to the issue of the economic effects of FDI associated with the natural resource sector. While most studies focus on manufacturing sectors at the national level, firm-level, industrial level, or regional level, it is surprising that few researchers have addressed the relationship between natural resources and FDI. Many empirical studies still argue whether the natural resource is a curse or a blessing. To close the gap in the literature, in Chapter 4, we employ a theoretical framework that provides an alternative explanation for the natural resource curse by two factors: corruption and fiscal policy, instead of giving the testing results whether natural resource curse exists in a particular country. By comparing the benchmark and full model represented for 2 cases with or without natural resource sector in the economy, we analyze the change in behavior of central government through incentives schemes that leads to the motivation of FDI-agency to decide whether they will distort the fiscal policy to obtain the higher bribe from foreign investors or attract more FDI-inflows to maximize their revenues.

5.3 Policy implications

From the government's perspective, we provided a rigorous reference for relevant policymakers to maximize the positive impact of FDI presence by considering the current situation of manufacturing firms in Vietnam. It is also of guiding significance to the development of environmental business in Vietnam. Understanding the positive and negative for FDI presence helps government and governmental agencies evaluate the efficiency of FDI-attracting policy and provides a better strategy to young firms for establishment when they intend to locate in a particular industry or region. While domestic firms operating in the regions that attract more FDI tend to experience higher productivity, those operating in more FDI tend to experience lower productivity. Then, the local authorities should encourage foreign investors to develop new industries in regions. It will not generate a negative effect on the local firms in the same region. The FDI-related firms may become models for domestic firms to learn and imitate.

Although these policy implications are suggested above to apply in Vietnam, they are also relevant for other developing countries that were controlled by a similar form of administrative

decentralization, such as China or India. Since there still exists an uneven distribution of FDI concentration in the larger urban areas or some locations, that result in a big gap in economic development among regions. The ideal situation is that by improving the local governance quality and business environment, these provinces with FDI concentration may externalize the positive spillover effect to nearby provinces and contribute to the provincial TFP. In the scope of this thesis, we suggest the local government should reference our results on the impact of each indicator of the PCI index – an indicator we use as a measurement to evaluate the improvement in the local governance quality. Not all of the factors bring positive effects to firms in the region. Some indicators even worsen the provincial TFP in the provinces with FDI presence and bring bad spillover to nearby provinces. The government should improve the transparency of law and regulation, especially in the tax system, land access, provincial Leadership, and labor training to ensure that all economic players have the same chance to enter the market and, therefore, reduce corruption, entry costs, informal charges.

Every country targets comprehensive economic development among regions. The central government is responsible for allocating the incentive power among areas. In Chapter 4, we emphasize the natural resource sector. And we have shown that if the government chooses a sufficient power of incentives, it is possible to prevent corruption and solve the resource curse on FDI. In this case, a natural question arises: why does the central government choose not to increase the power of incentive to escape from the curse? What form should, for example, which level of incentives offered to FDI-agency take? There is no generally valid “best” solution to this problem. The objective of chapter 4 is not to provide a complete answer to this question but to propose a possible explanation. We suggest that the central government may not choose a high power of incentive because the cost of providing incentives to the FDI agency is too high due to the shadow cost of public funds. On balance, resource-based development is possible, but it remains a challenge for poor or developing countries due to budget constraints.

In Chapter 4, we propose a replacement or complements to the policy based on incentives. We suggest that the central government can pursue a stringent anti-bribery policy. In the scope of this study, we don't consider the possible penalties of FDI agencies for accepting a bribe (Damania et al., 2004; Wilson & Damania, 2005). To investigate the effect of anti-bribery policy, we can assume that such a policy reduces the bargaining power of FDI agency over the foreign firm in the resource sector, leading to less motivated FDI agencies obtaining bribes due to more risk. Thus, less fiscal distortion and less corruption, and the FDI – resource curse is less likely.

The resource-producing countries should create a peaceful and transparent system of Investment laws and regulations, improve institutional quality that encourages FDI participation in both non-resource sectors and the resource sector.

5.4 Limitations and further research

Although the thesis shows some significant findings concerning impact externalities on the productivity at multi-level and our emphasis in this thesis is the FDI issue, there are some limitations to this study. One big problem is that our analysis is restricted by the data availability from 2010 – 2017. We try to differentiate two groups of firms: Firms established before and after FDI enter into a region to evaluate the effect of FDI. For future research, the period could be extended to provide more precise results.

In our study, although our sample is large enough to cover all types of enterprises, the number of FDI-related firms accounts for a small proportion. It prevents us from comparing the difference in FDI spillover effects to a firm's productivity in a particular form of business such as SMEs or SOEs sample. We can provide a general conclusion for the domestic firm rather than compare local firms' productivity and FDI-related firms in the SME sample.

Our theoretical framework has just provided a mechanism to explain the reason for the FDI resource curse by corruption and fiscal policy. Future research may develop our model to answer the question: Which level of incentives offered to the FDI agency decreases the natural resource curse under the budget constraints. Testing for causality between FDI inflows and corruption would also be a worthwhile exercise. It could provide further evidence of the importance of anti-corruption measures in natural resource sectors or the significance of investment policy as a way to curb corruption. Empirical studies also support a more profound analysis of specific countries or groups of countries.

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Thy LE - BAO

ESSAYS ON FOREIGN DIRECT INVESTMENT: FIRM PRODUCTIVITY, REGIONAL EXTERNALITIES, AND RESOURCE CURSE

Résumé

Cette thèse se compose de trois contributions sur le lien entre IDE et performance économique. Les deux premières contributions sont empiriques et portent sur le secteur manufacturier. À l'aide de données de panel portant sur 123 400 entreprises manufacturières provenant de l'Enquête sur les entreprises du Vietnam entre 2000 et 2017, nous identifions les effets qu'entraîne la présence d'IDE dans une région sur la productivité totale des facteurs des entreprises nationales à l'aide d'un modèle de l'écart dans les différences (DID). Ensuite, à l'aide d'un modèle spatial de Durbin, nous procédons à une évaluation empirique des effets directs et indirects de l'agglomération des IDE, des facteurs régionaux, et de la qualité de la gouvernance locale sur les différences inter-provinciales dans les productivités totales des facteurs. La troisième contribution porte sur le secteur des ressources naturelles. Nous proposons une nouvelle explication de la "malédiction des ressources" en utilisant un cadre théorique où politique fiscale et corruption sont endogènes.

Résumé en anglais

This Ph.D. dissertation consists of three contributions on the FDI and economic performance nexus. The first two contributions are empirical and deal with the manufacturing sector. Using panel data of 123,400 manufacturing firms coming from Vietnam's Enterprise Survey between 2000 and 2017, we identify the impacts of FDI presence in a region on the total factor productivity of domestic firms by using a difference in difference model (DID). Then, using a spatial Durbin model, we provide an empirical assessment of the direct and indirect effects of FDI agglomeration, regional factors, and local governance quality on the differences in provincial total factor productivity for both the short term and long term. The third contribution deals with the natural resource sector. We propose a new explanation of the FDI-resource curse using a theoretical framework where corruption and fiscal policy are endogenous.