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# Three Essays on FDI and International Trade: Cross-Sectoral and Micro Empirical Analysis for Developing Countries

Thi Phuong Mai Vu

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Thi Phuong Mai Vu. Three Essays on FDI and International Trade: Cross-Sectoral and Micro Empirical Analysis for Developing Countries. Economics and Finance. Université Côte d'Azur, 2016. English. NNT: 2016AZUR0034 . tel-01450756

**HAL Id: tel-01450756**

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École Doctorale n°513 D.E.S.P.E.G.  
Unité de recherche: GREDEG UMR 7321

# Thèse de doctorat

Présentée en vue de l'obtention du  
grade de docteur en Sciences Économiques  
de

UNIVERSITÉ NICE SOPHIA ANTIPOLIS membre de UNIVERSITÉ CÔTE D'AZUR

par

**Thi Phuong- Mai VU**

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**Trois Essais sur l'Investissement Direct à l'Étranger (IDE) et le  
Commerce International: Analyses Empiriques Sectorielles et  
Micro-Économiques pour les Pays en Voie de Développement**

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**Three Essays on FDI and International Trade: Cross- Sectoral  
and Micro Empirical Analysis for Developing Countries**

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**Dirigée par Flora BELLONE  
et codirigée par Thuy Anh TU**

Soutenue le 13 Décembre 2016

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I would like to dedicate this thesis to my loving parents ...



## **Declaration**

I hereby declare that except where specific reference is made to the work of others, the contents of this dissertation are original and have not been submitted in whole or in part for consideration for any other degree or qualification in this, or any other university. This dissertation is my own work and contains nothing which is the outcome of work done in collaboration with others, except as specified in the text and Acknowledgments. This dissertation contains fewer than 65,000 words including appendices, bibliography, footnotes, tables and equations and has fewer than 150 figures.

Vu Thi Phuong Mai

November 2016



## Acknowledgements

Writing a Ph.D. thesis is like embarking on a long journey. At the beginning, we are eager of exploring a new territory. However, to get the target, we need to get the right tools at the right place and understand the country of data. Along with this journey, we sometimes feel exhausted and wonder why we come here. Looking back this journey, I would like to thank many people who make my interest continued and difficulties reduced by half.

First and foremost, I would like to express my gratitude to my supervisor, Flora BELLONE, who was constantly available for so many questions and helped me to focus on the research to which I follow. From her, I learned to get the essentials out of sometimes rather confusing dataset and to be confident of what I was doing. Her never-ending energy and optimism have been of great encouragement to me. I also would like to thank my co-supervisor, Thuy-Anh TU, for her support. Although I did not have many chances to work with her, I always received her advice whenever I needed.

I wish to express my thanks to Prof. Diadié Diaw for all his kind support and help especially in econometrics. I would like to express my gratefulness to Prof. Kimura Kiyota, Prof. Mark Roberts, Prof. Marion DAVIS, Mr. Tran Thai Tan, Mr. Nguyen Chi Dung for spending time on reading my works as well as for their valuable comments and suggestions. And also, I would like to express my gratefulness to the members of the jury for agreeing to participate in the presentation.



A special thank goes to my colleagues Chu Mai Phuong, Dinh Thi Thanh Binh, Thai Long who are working at the Foreign Trade university of Vietnam for their data provision. I also would like to thank my friend Doan Thi Thanh Ha who is working for the Asian Development Bank Institute in Tokyo for her very valuable advice on the data cleaning. I warmly thank my old classmates at FTU, Tam Ninh and Nga Nguyen, who looked closely at the final version of the thesis for English style and grammar, correcting both and offering suggestions for improvement. I believe that without their kind support, I could not reach the final of my journey.

I wish to express my thanks to the Agence Universitaire de la Francophonie (AUF) for the scholarship. With their financial support, I had a chance to upgrade my knowledge and to explore so many places in the world. I also wish to send my thanks to all the staff and members at the laboratory GREDEG for their kindness and their share during my study here, especially Cyrielle Gaglio, Prof. Christophe Charlier, Ankinée Kirakozian, Mira Toumi, Maelle Della-Peruta, Imen Bouhlel.

I especially thank my cousin Vu Duy, my big brother Dang Minh Dung and all other friends who have supported me over the last few years: Vo Ngoc Duong, Ha Son Hai, Luong Ngoc Dung, Duong Quynh Anh, Nguyen Hai Yen, Nguyen Thi Hoa Hue, Dang Dieu Linh...They made my journey more enjoyable with chit-chats as well as encouragement when I was getting down. Last but not least, words cannot express how grateful I am to my family : my parents, my husband and my son for their encouragement on my academic journey.

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# Introduction Générale

Selon Ozawa (1992), il existe deux types de régimes de commerce et d'investissement: un tourné vers l'extérieur, orienté vers l'exportation (OL-EO) et l'autre tourné vers l'intérieur, axé sur la substitution des importations (IL-IS). Il est bien connu que le modèle OL-EO qui se caractérise par une mobilité croissante des facteurs internationaux, principalement sous la forme d'investissements directs étrangers (IDE), est plus efficace et plus préféré que le modèle IL-IS, en particulier dans les pays asiatiques en développement qui ont atteint une forte croissance économique grâce au développement commercial et à l'ouverture de leurs économies. Cela explique pourquoi la croissance significative de l'IDE reflétée dans les valeurs de la production internationale<sup>1</sup> représente une part importante dans l'économie mondiale. À bien des égards, les multinationales (MNC) sont devenues le noyau d'une grande partie des transactions internationales. En fait, près de la moitié des flux commerciaux sont échanges intra-firme, À-dire, le commerce au sein d'une MNC (Blonigen (2005)). Sans aucun doute, au cours des dernières décennies, l'expansion des IDE et l'augmentation continue des multinationales ont considérablement modifié la structure des activités économiques mondiales.

En conséquence, les études tant théoriques qu'empiriques sur l'IDE sont nombreuses. Généralement, les questions principales que ces études traitent portent sur: la

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<sup>1</sup>La production internationale se compose de la production située dans un pays mais contrôlée par une multinationale dont le siège est situé dans un autre pays et qui est financé principalement par des IDE



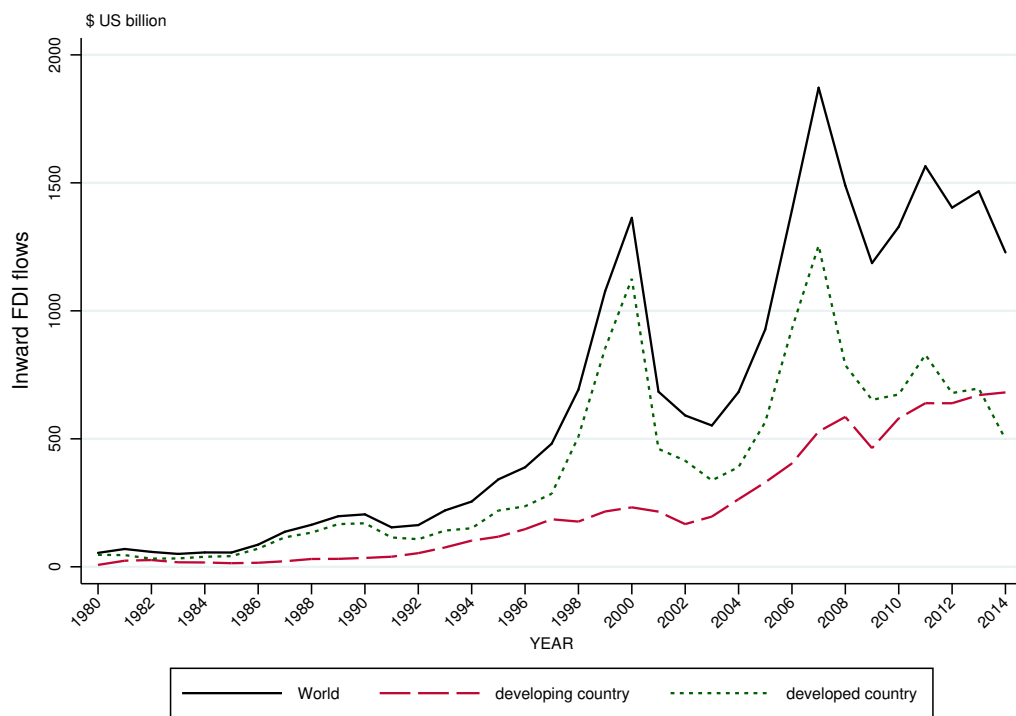
relation entre l'IDE et la croissance économique (Ozawa (1992), Singh and Jun (1995), Borensztein et al. (1998), Markusen and Venables (1999), Carkovic and Levine (2002), Hermes and Lensink (2003)...); les déterminants de l'IDE (Agarwal (1980), Schneider and Frey (1985), Lucas (1993), Singh and Jun (1995), Bevan and Estrin (2000), Asiedu (2002), Bénassy-Quéré et al. (2007)...); les effets (de retombées) de la présence de firmes étrangères sur les firmes domestiques (Aitken and Harrison (1999), Liu et al. (2000), Konings (2001), Görg and Greenaway (2004), Smarzynska Javorcik (2004), Lipsey (2004), Haskel et al. (2007)...); ou la promotion de l'IDE (Friedman et al. (1992), Oman and Oman (2000), Hanson et al. (2001), Luo et al. (2010)). Évidemment, les multinationales sont placées au cœur de nombreuses disciplines et de nombreux débats. La théorie des multinationales se pose les questions de savoir pourquoi les multinationales existent et pourquoi elles investissent à l'étranger (Dunning (1973), Caves (2007), Markusen (1995)). Dans ce champ, un sujet d'intérêt constant pour les chercheurs, est la performance comparative des firmes domestiques par rapport aux firmes détenues par des capitaux étrangers. Les études empiriques concernant ce sujet traitent d'indicateurs de performance divers: écarts de salaires (Globerman et al. (1994), Aitken et al. (1996), Oulton et al. (1998), Feliciano and Lipsey (1999), Girma et al. (2001), Girma and Görg (2007)); écarts de compétences (Howenstine and Zeile (1992), Doms and Jensen (1998), Blomström and Sjöholm (1999), Blonigen and Slaughter (2001)); écarts de relations de travail (Cousineau et al. (1991), Carmichael (1992), Ramstetter (2004)); écarts de croissance (Sjöholm (1999a), Djankov and Hoekman (2000), Blonigen and Tomlin (2001), Baldwin and Gu (2005)); écarts de rentabilité (Lecraw (1984), Kumar (1990), Chhibber and Majumdar (1999), Mataloni (2000), Love et al. (2009)); écarts de technologie (Fors (1997), Blomström and Sjöholm (1999), Sjöholm (1999b), Vishwasrao and Bosshardt (2001), Damijan and Knell (2005)); écarts de productivité (Davies and Lyons (1991), Howenstine and Zeile (1992), McGuckin and Nguyen (1995), Maliranta et al. (1997), Modén (1998), Oulton et al. (1998), Doms and Jensen (1998), Harris and Robinson (2003),

Girma and Görg (2004), Griffith et al. (2004), Benfratello and Sembenelli (2006)). Compte tenu de ce contexte, nous avons l'intention de contribuer à ce domaine de recherche en deux respects principaux.

D'abord, nous fournissons une base analytique pour caractériser la relation entre les flux d'IDE entrants et les autres flux de capitaux internationaux vers les pays en développement. De facto, l'IED est devenu une force motrice particulièrement importante derrière le développement de nombreux pays. Il est largement admis que cette tendance réelle de la mondialisation a entraîné une forte augmentation des flux d'IDE vers les pays en développement. D'après UNCTAD (2015), à plus de 30 ans, les entrées d'IDE dans les pays en développement se sont étendu fortement, passant de 7,4 milliards de dollars américains en 1980 à 681,4 milliards en 2014. La part de ces IDE vers les pays en développement dans le total des flux d'IDE mondial a augmenté de 14 % en 1980 à 56 % en 2014 (figure ??). Les économies en voie de développement ont ainsi accru leur avance dans des afflux d'IDE mondiaux et participent plus que jamais auparavant au réseau de production international. En même temps, la théorie a fait des progrès pour mieux rendre compte des impacts des flux d'IDE sur les économies nationales en présence d'entreprises hétérogènes (Rugman (1980), Hennart (1982), Dunning and Rugman (1985), Balasubramanyam et al. (1996), Borensztein et al. (1998), Helpman et al. (2003), Melitz (2003), Wagner (2006), Bernard et al. (2007b), Liu (2008)...). Considérant ces deux tendances, il existe une nouvelle avenue pour étudier le rôle de l'IDE dans les économies en développement. En particulier, bien qu'une grande partie des études se soit concentrée sur l'IDE, il y a eu une négligence remarquable de recherches sur l'interaction entre l'IDE et d'autres types de capitaux ainsi qu'entre l'IDE et le commerce. La présente thèse vise à combler cette lacune.

Ensuite, nous examinons l'hétérogénéité des entreprises en ce qui concerne la propriété, domestique versus étrangère, et le type d'activité commerciale, transformation

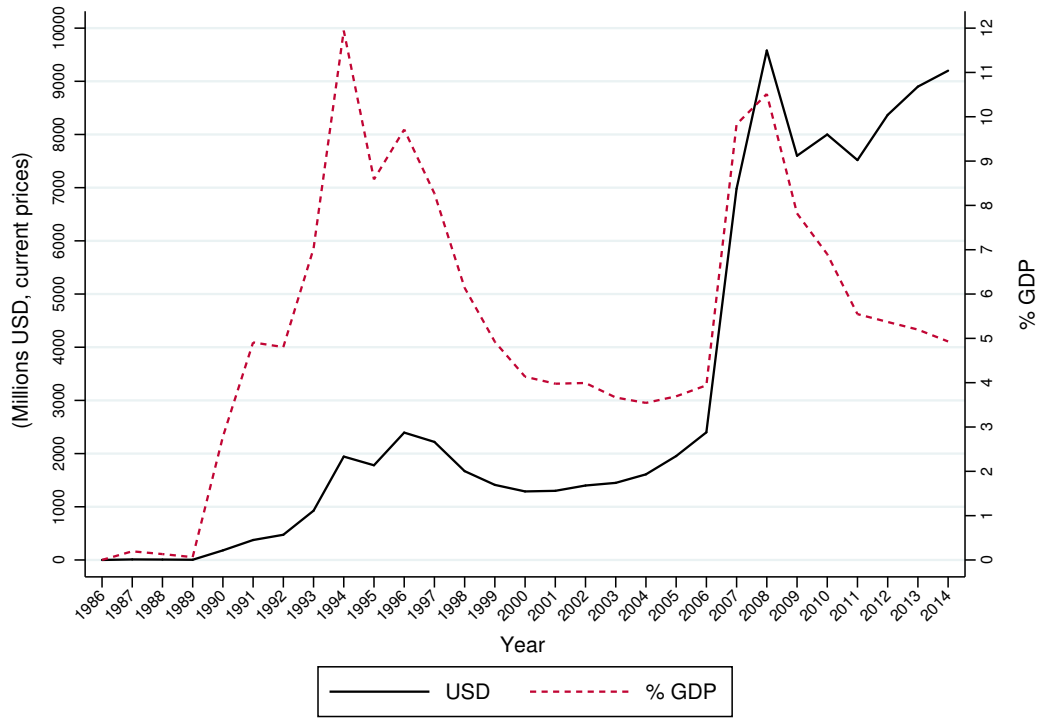
Figure 0.1 Tendances mondiales de l'IDE, 1980-2014



Source: UNCTAD database

(*processing*) versus commerce ordinaire,) dans le cas d'un petit pays en développement, en mettant l'accent sur l'économie vietnamienne. Nous avons choisi le Vietnam comme étude de cas parce que c'est un cas de réussite d'attrait des IDE et en raison de la disponibilité de ses données micro-économiques. En effet, depuis l'unification nationale entre 1975 et 1985, le Vietnam a été intégré dans le système commercial de l'Union soviétique et ses alliés avec peu d'autres liens. L'échec du système d'ajustement des prix et des salaires en 1985 a entraîné une hyperinflation de 775% en 1986, un déficit budgétaire élevé, des déséquilibres commerciaux chroniques, une pénurie d'aliments et de biens de consommation courante et des conditions de vie appauvries. Cette grave crise économique avait mis le gouvernement vietnamien sous une immense pression pour amorcer une réforme économique globale. Par conséquent, les politiques de *Doi Moi* sont nées en 1986, correspondant à cette tâche. Depuis l'adoption de *Doi Moi*, le Vietnam a transformé d'une économie planifiée centralement en une économie de marché. L'ouverture de l'économie aux IDE et la réduction de la dépendance à l'égard des entreprises d'État (SOEs) ont été deux éléments clés de ces réformes. La première Loi sur l'Investissement Étranger promulguée en 1987 a permis une première vague d'entrées d'IDE au Vietnam. En termes relatifs, le Vietnam est devenu un grand destinataire de l'IDE au milieu des années 1990, comme on peut dans le voir dans la Figure 0.2. Toutefois, entre 1996 et 2006, l'IDE a perdu son élan et a depuis fluctué à un niveau beaucoup plus bas en raison de "l'incertitude économique créée par la crise en Asie de l'Est, l'ambivalence des politiques intérieures et la complaisance résultant du succès des réformes initiales" (Athukorala and Tien (2012)). Par conséquent, les réformes des politiques qui ont suivi la récession économique de 1997-2006 ont donné une nouvelle impulsion à la promotion de l'IDE. De ce point de vue, la loi sur les IDE a été modifiée à plusieurs reprises afin de mieux éliminer les obstacles contre l'opération d'investisseurs étrangers et d'améliorer le climat d'investissement au Vietnam. Par exemple, conformément à l'amendement du 9 Juin 2000, les joint-ventures étrangers ont été autorisés de se transformer

Figure 0.2 L'évolution des IDE entrant au Vietnam, 1986-2014



Source: UNCTAD database

en filiales entièrement en possession des sociétés parentales et de fusionner pour consolider les sociétés. En Avril 2003, 100 % d'entreprises étrangères ont été autorisées à devenir des sociétés actionnaires. Plus récemment, une nouvelle loi unifiée sur l'investissement a été publiée en Décembre 2005, entrée en vigueur en juillet 2006, en remplacement de la loi sur l'investissement étranger et de la loi sur la promotion des investissements intérieurs. La nouvelle loi a permis de traiter également les investisseurs étrangers et locaux en ce qui concerne l'approbation des investissements et les incitations offertes, afin de donner aux investisseurs une liberté totale dans le choix du mode particulier d'entrée des affaires, c'est-à-dire BCC, joint-venture ou pleine propriété. À partir de 2007, avec l'adoption de la nouvelle loi sur l'investissement unifié ainsi que des engagements d'adhésion à l'OMC, le Vietnam enregistre une augmentation rapide de l'IDE, malgré une légère stagnation par suite de la double crise bancaire et de la balance des paiements en 2009 et 2010.

En dehors des politiques favorables et ouvertes à l'investissement étranger, les autres principales raisons qui expliquent cette réussite vietnamienne sont la grande taille du marché avec près de 90 millions de personnes pour les fabricants de biens de consommation; le bon marché des facteurs de production; la stabilité socio-politique <sup>2</sup>; la structure démographique de la population <sup>3</sup>; et la situation géographique favorable au coeur de l'Asie de l'Est. De plus, le pays est membre de l'OMC et a pris part à de multiples cadres d'intégration économique internationale, en particulier les négociations du Partenariat transpacifique (TPP).

Néanmoins, il existe encore certaines préoccupations auxquels les investisseurs étrangers doivent faire face au Vietnam. Selon VCCI and USAID (2016), plus de 11% des entreprises étrangères ont indiqué avoir dépensé plus de 10% de revenu en coûts irrécupérables

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<sup>2</sup>La croissance économique entre 1991 et 2010 a atteint en moyenne de 7,5% chaque année et, malgré de nombreuses difficultés que le pays a traitées entre 2011 et 2013, la croissance du PIB a encore augmenté de 5,6%.

<sup>3</sup>60% de sa population sont en âge de travailler.

(frais informels)<sup>4</sup>. 39% des entreprises étudiées ont démontré le favoritisme des autorités provinciales envers les sociétés d'État qui ont causé des difficultés au fonctionnement de leurs entreprises. En effet, le Vietnam n'a pas été en mesure de tirer pleinement parti des avantages de l'IDE, car l'accès à l'information - en particulier les documents clés relatifs aux budgets et à la planification locaux - semble en réalité se détériorer avec le temps. Les investisseurs étrangers éprouvent plus de difficultés à acquérir l'information, une plus grande dépendance à l'égard des relations personnelles et des liens pour l'obtenir, et une information de qualité inférieure lorsqu'ils le trouvent. Environ 70% des entreprises étrangères déclarent qu'elles consacrent plus de 5% de leur temps à des procédures bureaucratiques. Les mêmes entreprises évaluent le Vietnam comme étant nettement moins attrayant en ce qui concerne la corruption, les contraintes réglementaires, la qualité des services publics (tels que l'éducation, les soins de santé et les services publics), et la qualité et la fiabilité des infrastructures. Quant aux perceptions de risque, les investisseurs étrangers sont préoccupés par deux grands types de risques: premièrement, le risque macroéconomique, causé par des changements dans le système financier international ou national; deuxièmement, le risque réglementaire, causé par des modifications de la réglementation ou des impôts qui réduisent la rentabilité.

Au niveau de l'entreprise, une entreprise (en possession) étrangère typique au Vietnam est «relativement petite, axée sur l'exportation et opère une affaire à faible marge qui se sous-traite à un plus grand producteur multinational - et se trouve donc habituellement parmi les nœuds les plus bas de la chaîne de valeur d'un produit"(VCCI and USAID (2014), p.19). Les entreprises étrangères ont contribué à améliorer la qualité des ressources humaines, la valeur de la production industrielle et la valeur d'exportation du Vietnam. Cependant, les relations commerciales formelles entre les investisseurs étrangers et locaux restent encore faibles après presque 30 ans depuis le jour où la loi sur l'investissement étranger a été publiée.

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<sup>4</sup>Le pourcentage d'entreprises payant ces frais a augmenté ces dernières années de 50% (2013), à 64,5% (2014) et 66% en 2015.

En conséquence, la question des retombées de la technologie et de la productivité du travail des partenaires étrangers aux entreprises domestiques vietnamiennes reste ouverte.

Cette dissertation tente d'examiner la relation entre la propriété étrangère et la performance de l'entreprise afin de mieux comprendre le comportement des entreprises étrangères ainsi que de clarifier le mécanisme de propagation entre eux et les firmes domestiques vietnamiennes. Nous approfondissons notre étude spécifiquement dans les secteurs d'exportation afin de remettre en question le rôle que pourraient jouer les entreprises de transformation des exportations, en particulier les entreprises étrangères, dans la productivité et la dynamique salariale du Vietnam. En détail, la thèse est structurée en trois chapitres comme suit.

Dans le chapitre 1, nous proposons de nous concentrer sur la question de savoir comment promouvoir les entrées d'IDE vers les pays en développement en examinant les liens de causalité entre les flux d'IDE et les flux d'aide publique au développement (APD). Nous tentons de vérifier si la relation entre l'IDE et l'APD est davantage susceptible d'être complémentaire ou substituable. Nous suivons Selaya and Sunesen (2012) dans l'expansion du modèle de Solow (1957) pour une petite économie ouverte afin d'étudier les impacts de l'APD sur l'IDE. Selon Kimura and Todo (2010), nous estimons notre modèle par des méthodes de Variables instrumentales (IV). En effet, notre modèle préféré est l'estimateur *System-GMM* (S-GMM) proposé par Blundell and Bond (1998) qui utilise des conditions de moment supplémentaires. Nous utilisons les données du panel ventilées par industrie à travers 32 pays en développement pendant 8 ans de 2003 à 2010. Nos analyses statistiques confirment que l'IDE représente la principale source de financement externe de ces pays. En distinguant les IDE par deux grandes catégories, nous constatons que les IDE sont plus concentrés dans le capital physique tandis que les APD sont plus intensives dans les intrants complémentaires comme l'éducation, la santé, l'approvisionnement en eau, le développement



bancaire, le développement urbain, les institutions scientifiques et de recherche ...<sup>5</sup>. En outre, les nouvelles économies émergentes d'Asie semblent être les destinations les plus attrayantes de l'APD en termes d'intrants complémentaires ainsi que les IDE. Parmi ces pays, le Vietnam est considéré comme un cas typique à étudier. En ce qui concerne l'évidence empirique, nos résultats au niveau agrégé soutiennent le point de vue selon lequel l'effet substituable de l'APD sur l'IDE surpasse son effet complémentaire. Ce résultat est cohérent avec les résultats précédents de Caselli and Feyrer (2007) et Beladi and Oladi (2006), mais contraste avec ceux de Asiedu et al. (2009), Blaise (2005) et Selaya and Sunesen (2012). C'est-à-dire que la nature et l'étendue de la relation (complémentaire ou substituable/ positive ou négative) peuvent varier d'un pays à un autre. Au niveau intersectoriel, nos résultats appuient fortement l'hypothèse selon laquelle l'APD investie dans les apports complémentaires ( $ODA_A$ ) complète l'IDE investi dans le capital physique ( $FDI_K$ ) tandis que l'APD finançant le capital physique ( $ODA_K$ ) se substitue aux investissements étrangers privés. Cependant, contrairement à l'hypothèse proposée par Selaya and Sunesen (2012), nous montrons qu'il n'y a pas assez d'évidence pour conclure que l'APD dans le capital physique évince un à un l'IDE de même type. En examinant davantage la composition de l'IDE, nous voyons aussi que l'IDE investi en intrants complémentaires a le même comportement que son homologue APD. Nous suggérons alors que l'IDE dans les secteurs complémentaires renforce plus l'efficacité de l'IDE dans les secteurs du capital physique. De plus, nous constatons aussi que la qualité de la gouvernance (l'indice de Kaufmann) représente un déterminant indirect plutôt qu'un déterminant direct de  $FDI_K$  car la signification du coefficient estimé  $FDI_K$  sera changée une fois que nous contrôlons l'effet d'interaction entre l'indice de Kaufmann et  $ODA_K$ . En bref, nos conclusions empiriques suggèrent la recommandation d'investir l'APD dans des apports complémentaires qui permettra d'accroître l'accumulation et l'efficacité des investissements étrangers dans les pays en développement.

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<sup>5</sup>Pour la définition complète, voir la Section 1.6 dans le Chapitre 1.

Dans le chapitre 2, en utilisant des micro-données de panel pour les entreprises situées dans un petit pays de développement comme le Vietnam, nous cherchons à vérifier les différences de performance entre les firmes détenues par des capitaux étrangers <sup>6</sup> et les firmes domestiques dans les secteurs manufacturiers. Nos données proviennent de l'Enquête annuelle sur les entreprises (ASOE) fournie par l'Office Statistique Général (OSG) du Vietnam qui couvre toutes les entreprises enregistrées au Vietnam au cours de la période de 2000 à 2013. Les données ASOE présente les avantages suivants. Premièrement, l'enquête est exhaustive (toutes les entreprises enregistrées sont couvertes, sans seuil de taille, à l'exception des activités des ménages). Deuxièmement, elle comprend des informations comptables pertinentes sur les extrants, les intrants et les exportations. Enfin, elle inclut des informations clés qui nous permettent d'identifier à la fois la propriété de l'entreprise et le type de commerce dans lesquels les firmes sont impliquées. En résumé, après le nettoyage, notre échantillon se compose d'environ 194,900 entreprises manufacturières au cours de la période 2000-2013. Selon Kimura and Kiyota (2007), nous vérifions les différences de caractéristiques entre les firmes étrangères et les firmes domestiques à la fois dans *les aspects statiques*, y compris les indicateurs de base tels que la rentabilité (rendements des actifs- ROA et rendement des capitaux propres- ROE), la productivité (valeur ajoutée-VA et productivité totale des facteurs- PTF) et d'autres caractéristiques telles que la taille de l'entreprise; et dans *les aspects dynamiques* en testant si les entreprises potentiellement rentables deviennent des entreprises en possession étrangère par le biais de Fusions Et Acquisitions- M&A ou non. Pour examiner ceci, le modèle analytique dynamique développé par Roberts and Tybout (1997) et Bernard and Jensen (2004) sera utilisé. Nous testons l'hypothèse de travail selon laquelle les multinationales surpassent les entreprises domestiques et réalisent une croissance plus rapide que celles-ci. Nous vérifions également si les entreprises domestiques qui sont potentiellement rentables sont davantage susceptibles

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<sup>6</sup>Dans cette dissertation, pour la simplicité, nous dénotons comme "les entreprises en possession étrangère" ou "les entreprises étrangères" les entreprises qui sont soit purement étrangères soit des multinationales.

d'être acquises et si les entreprises acquises sont davantage susceptibles de survivre sur le marché vietnamien comparativement aux entreprises domestiques. Les traits les plus frappants de ce chapitre sont triples. Premièrement, nous fournissons des éléments de preuve qui confirment que les entreprises de propriété étrangère surpassent les entreprises en possession domestique en termes de productivité, mais qu'elles sont moins performantes que ces dernières en termes de rentabilité. Cette preuve est cohérente avec le phénomène appelé *prix de transfert* qui provoque la sous-estimation de la rentabilité réelle des entreprises en possession étrangère causant le biais de notre estimation. Deuxièmement, nous constatons que les entreprises en possession étrangère croissent plus rapidement que les entreprises domestiques dans toutes les marges de performance. Néanmoins, une fois que nous contrôlons les effets de la taille de l'entreprise et des dépenses de R&D/Ventes, les entreprises étrangères sont moins rentables que les entreprises domestiques. Troisièmement, en termes de survie des entreprises étrangères par rapport aux entreprises vietnamiennes, nous constatons que les entreprises étrangères semblent survivre mieux sur le marché vietnamien que les entreprises domestiques. En termes d'intervention politique, nous démontrons deux préoccupations majeures auxquelles les décideurs vietnamiens doivent faire face: le premier est les prix de transfert erronés au sein des multinationales et le second est les coûts irréversibles, ce qui suggère de renforcer la rigueur des lois sur les investissements ainsi que la transparence de l'environnement d'investissement. Ces derniers devraient être améliorés afin de garder le Vietnam comme une destination attrayante pour l'IDE et, dans le même temps favoriser les retombées positives de ces investissements pour l'économie nationale.

Dans le chapitre 3, en nous appuyant sur la même base de données utilisée dans le chapitre 2, nous étudions, comme point de départ, les distributions des intensités d'exportations des entreprises manufacturières opérant au Vietnam. Tandis que la distribution de ces intensités d'exportation diminue de façon monotone dans tous les pays développés (au sein desquels opèrent une majorité de firmes non exportatrice et une très faible minorité

de firmes très fortement exportatrices), cette même distribution s'est révélée en forme de U dans certaines économies émergentes, en particulier celles qui prennent une part importante dans les chaînes de valeur mondiales (CVM) comme la Chine et le Mexique. .. Donc, nous étudions si ce modèle en U se tient également pour le Vietnam. Notre échantillon se compose d'environ 24,000 entreprises manufacturières en moyenne sur la période 2010-2013 avec 6,300 entreprises manufacturières en 2000 comme l'année de référence. Pour examiner les primes à l'exportation qui différencient les exportateurs ordinaires et les exportateurs de transformation (*processing firms*), nous commençons par des mesures non paramétriques en définissant les primes à l'exportation comme des différences systématiques dans *quelques* caractéristiques des entreprises exportatrices par rapport aux non-exportatrices après avoir contrôlé des effets d'industries, des effets spécifiques aux années et des effets de cohortes. Nous estimons ensuite l'exportation  *premia* de façon paramétrique en régressant certaines des caractéristiques de l'entreprise sur leur statut d'exportation discriminant les exportateurs ordinaires et les transformateurs. Dans notre spécification préférée, nous présentons les effets fixes industrie, année et cohorte ainsi que le contrôle de la taille, de la propriété et de l'intensité du capital. Quant à nos variables dépendantes, nos principales variables d'intérêt sont la productivité totale des facteurs (PTF), la productivité du travail, la productivité du capital et le salaire moyen par travailleur. Nous révélons de nouveaux faits indiquant que les entreprises de transformation sont moins productives et paient des salaires plus bas que leurs homologues ordinaires (même parfois que les entreprises non exportatrices). Ce modèle anormal est plus frappant pour les entreprises étrangères et les entreprises opérant au sein des zones non tarifaires (NTZ). Ces preuves sont contraires à celles trouvées dans les travaux précédents qui documentent l'efficacité productive supérieure des entreprises exportatrices par rapport à celles qui ne sont pas exportatrices dans une grande variété de pays développés (Bernard and Jensen (1995, 1999), Clerides et al. (1998), Bernard and Wagner (1997), Aw et al. (2000)), mais en ligne avec les résultats pour la Chine (Lu (2010), Lu et al. (2010),

Dai et al. (2016)) et d'autres pays très impliqués dans GVC. Dans l'ensemble, nos résultats indiquent que le commerce de transformation est une activité exceptionnelle qui devrait être étudiée séparément par rapport à d'autres types de commerce pour spécifier sa contribution à la productivité ainsi que la dynamique des salaires dans les économies émergentes.

# General Introduction

According to Ozawa (1992), there are basically two types of trade and investment regimes: an outward-looking, export-oriented (OL-EO) type, and inward-looking, import substituting (IL-IS) type. It is well known that OL-EO model which is characterized by increasing international factor mobility, mainly under the form of foreign direct investment (FDI), is more effective and more preferred than IL-IS model, especially in the case of Asian developing countries that have reached high economic growth through trade- led development and opening up their economies. That explains why the significant growth of FDI reflected in the values of international production<sup>1</sup> is present of considerable importance in the global economy. In many ways, multinational corporations (MNCs) have become the kernel for a large share of international transactions. In fact, almost half of trade flows are intra-firm; i.e., trade within a MNC (Blonigen (2005)). Undoubtedly, during the last few decades, the expansion of foreign direct investment (FDI) and the continuous increase of MNCs have changed the structure of the worldwide economic activities to a large extent.

As a result, both theoretical and empirical studies on FDI are numerous. Generally, the main questions that these studies deal with are about: the relationship between FDI and economic growth (Ozawa (1992), Singh and Jun (1995), Borensztein et al. (1998), Markusen and Venables (1999), Carkovic and Levine (2002), Hermes and Lensink (2003)...); the

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<sup>1</sup>International production consists of the production located in a country but controlled by a multinational corporation with headquarter in another country, and is mostly financed through FDI

determinants of FDI (Agarwal (1980), Schneider and Frey (1985), Lucas (1993), Singh and Jun (1995), Bevan and Estrin (2000), Asiedu (2002), Bénassy-Quéré et al. (2007)...); the (spillover) effects of FDI on domestic firms (Aitken and Harrison (1999), Liu et al. (2000), Konings (2001), Görg and Greenaway (2004), Smarzynska Javorcik (2004), Lipsey (2004), Haskel et al. (2007)...); or the promotion of FDI (Friedman et al. (1992), Oman and Oman (2000), Hanson et al. (2001), Luo et al. (2010)). Obviously, the MNCs are placed at the core of many disciplines and of many debates as well. The theory of the MNCs solve the issues, why MNCs exist and why they invest abroad (Dunning (1973), Caves (2007), Markusen (1995)). In this field, the subject, which is the continuous interest of researchers, is the comparative performance of domestic owned firms and foreign owned firms. The empirical studies relating to this subject are various: wage gaps (Globerman et al. (1994), Aitken et al. (1996), Oulton et al. (1998), Feliciano and Lipsey (1999), Girma et al. (2001), Girma and Görg (2007)); skill gaps (Howenstine and Zeile (1992), Doms and Jensen (1998), Blomström and Sjöholm (1999), Blonigen and Slaughter (2001)); labor-relation gaps (Cousineau et al. (1991), Carmichael (1992), Ramstetter (2004)); growth gaps (Sjöholm (1999a), Djankov and Hoekman (2000), Blonigen and Tomlin (2001), Baldwin and Gu (2005)); profitability gaps (Lecraw (1984), Kumar (1990), Chhibber and Majumdar (1999), Mataloni (2000), Love et al. (2009)); technology gaps (Fors (1997), Blomström and Sjöholm (1999), Sjöholm (1999b), Vishwasrao and Bosshardt (2001), Damijan and Knell (2005)); productivity gaps, which have drawn the largest attention in empirical research (Davies and Lyons (1991), Howenstine and Zeile (1992), McGuckin and Nguyen (1995), Maliranta et al. (1997), Modén (1998), Oulton et al. (1998), Doms and Jensen (1998), Harris and Robinson (2003), Girma and Görg (2004), Griffith et al. (2004), Benfratello and Sembenelli (2006)). Given this background, we intend to contribute to this field of research on two main respects.

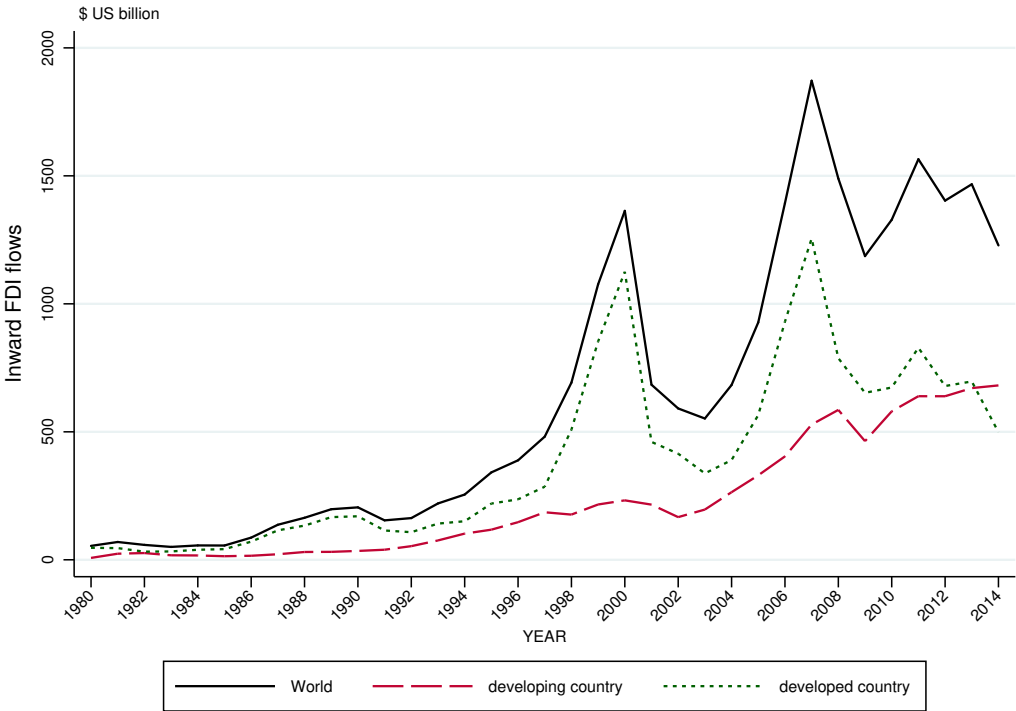
First, we provide an analytical foundation for characterizing the relationship between inward FDI flows and other international capital flows to developing countries.

De facto, FDI has evolved into a particularly significant driving force behind the development of many countries. It is widely believed that this real-world trend in globalization has induced a large increase in FDI flows to developing countries. According to UNCTAD (2015), by over 30 years, FDI inflows in developing countries have expanded strongly from US \$ 7.4 billion in 1980 to US \$ 681.4 billion in 2014. The share of those FDI towards developing countries in total FDI flows increased from 14% in 1980 to 56% in 2014 (Figure 0.1). Developing economies thus extended their lead in global FDI inflows and are participating more than ever before in the international production network. At the same time, the theory has made progress to offer a better account on how FDI inflows impact national economies in the presence of heterogeneous firms (Rugman (1980), Hennart (1982), Dunning and Rugman (1985), Balasubramanyam et al. (1996), Borensztein et al. (1998), Helpman et al. (2003), Melitz (2003), Wagner (2006), Bernard et al. (2007b), Liu (2008)...). Considering both trends, there is a new room for investigating the role of FDI in developing economies. Particularly, although a large part of studies has focused on FDI, there has been a marked neglect of researches on the interaction between FDI and other types of capital and trade. The present thesis aims to fill in this gap.

Second, we investigate the firm heterogeneity in terms of ownership (domestic versus foreign-owned) and trade activity (processing versus ordinary trade) in the case of a small, developing country, by focusing on the Vietnamese Economy. We have chosen Vietnam as a case study because this is a success story of attracting FDI and because of its microdata availability. Effectively, from the national unification in 1975 to 1985, Vietnam was integrated into the trading system of the Soviet Union and its allies with few other linkages. The failure of *the 1985 price-wage-currency adjustment scheme* resulted in hyperinflation of 775% in 1986, high budget deficit, chronic trade imbalances, scarcity of food and basic consumer goods, and impoverished living conditions. The severe economic crisis had put the Vietnamese government under immense pressure to initiate an overall



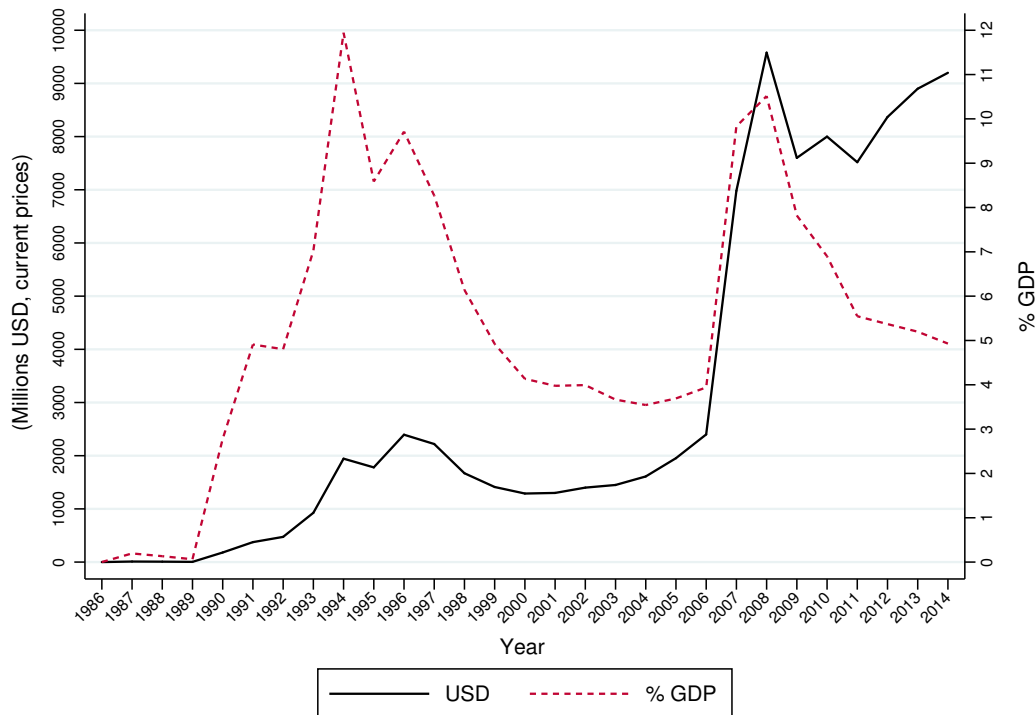
Figure 0.1 FDI global trends, 1980-2014



Source: UNCTAD database

economic reform. Therefore, *Doi Moi* policies were born in 1986, corresponding to this task. From the adoption of *Doi Moi*, Vietnam's economy has transformed from a centrally-planned model to market oriented. Opening the economy to FDI and reducing the dependence on state-owned enterprises (SOEs) have been two key elements of these policy reforms.

Figure 0.2 The evolution of Inward FDI in Vietnam, 1986-2014



Source: UNCTAD database

The first Law on Foreign Investment promulgated in 1987 enabled a surge of the first wave of FDI inflows into Vietnam. In relative terms, Vietnam became a large recipient of FDI by the middle of the 1990s, as indicated in Figure 0.2. However, between 1996 and 2006 FDI lost momentum and has since been fluctuating at a much lower level due to "economic uncertainty created by the East Asian crisis, domestic policy ambivalence and complacency resulting from the success of the initial reforms" (Athukorala and Tien (2012)). Therefore, policy reforms following the economic downturn during 1997-2006 placed renewed emphasis

on FDI promotion. From this point, the FDI law was amended several times to better remove obstacles against the operation of foreign investors and to improve the investment climate in Vietnam. For instance, under the amendment on 9 June 2000, joint-ventures foreign firms were given freedom to convert into fully owned subsidiaries of parent companies and to merge and consolidate enterprises. In April 2003, 100% foreign-owned firms were allowed to become shareholding firms. Most recently, a new unified Investment Law was issued in December 2005, which came into effect in July 2006, to replace the Law on Foreign Investment and the Law on Domestic Investment Promotion. The new law allowed to treat foreign and local investors equally with regard to investment approval and the incentives offered, to provide investors with complete freedom in the choice of the particular mode of business entry, i.e. BCC, joint-venture or full ownership. From 2007, under the adoption of the new unified investment law as well as the WTO accession commitments, Vietnam has recorded a rapid increase in FDI, despite there was a slight stagnation since dual banking and balance of payments crises occurred in 2009 and 2010.

Besides favorable and open policies toward foreign investments, the main reasons which explain this Vietnamese success story are also the large market with nearly 90 million people for consumer goods manufacturers; low costs of production factors; socio-political stability<sup>2</sup>; golden population structure<sup>3</sup> and favorable geographical location right at the heart of East-Asia. In addition, the country is a member of the WTO and party to multiple frameworks for international economic integration, particularly the Trans-Pacific Partnership (TPP) negotiations.

Nevertheless, there still exists some concerns that foreign investors have to face in Vietnam. According to VCCI and USAID (2016), over 11% of foreign firms indicated

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<sup>2</sup>The economic growth between 1991 and 2010 averaged 7.5% each year and, despite many difficulties the country dealt with between 2011 and 2013, GDP growth still rose by 5.6%.

<sup>3</sup>60% of its population are working age.

that they have spent more than 10% of revenue on the sunk cost (informal charges) <sup>4</sup>. 39% of investigated firms demonstrated the favoritism of provincial authorities towards state corporations caused difficulties to their firm's operation. Indeed, Vietnam has not been able to fully reap the benefits of FDI, because the access to information – particularly key documents pertaining to local budgets and planning – actually appears to be worsening over time. Foreign investors report more difficulty acquiring the information, greater dependence on personal relationships and connections to obtain it, and lower quality information when they do find it. About 70% report that they spend over 5% of their time dealing with bureaucratic procedures. The same firms evaluate Vietnam to be significantly less attractive when it comes to corruption, regulatory burdens, quality of public services (such as education, healthcare, and utilities), and the quality and reliability of infrastructure. Regarding risk perceptions, foreign investors are concerned about two major types of risk: first, macroeconomic risk caused by changes in international or domestic finance system; second, regulatory risk, caused by changes in regulations or taxes that reduce profitability.

At the firm level, the typical foreign (owned) firm in Vietnam is "relatively small, export-oriented and operates a low-margin business that is subcontracting to a larger multinational producer—and is therefore usually situated among the lowest nodes of a product's value chain" (VCCI and USAID (2014), p.19). Foreign firms have contributed to improving the human resource quality, industrial production value and export value of Vietnam. However, the formal business connections between foreign and local investors remain still small after nearly 30 years since the day the Foreign Investment Law was released. Consequently, the technology and labor productivity spillovers from foreign partners to Vietnamese domestic firms remain quietly weak.

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<sup>4</sup>The percentage of firms paying these charges rose up in recent years from 50% (2013), to 64.5% (2014) and 66% in 2015.

This dissertation attempt to examine the relationship between foreign ownership and corporate performance to better understand the behavior of foreign firms as well as clarify the spillover mechanism between them and Vietnamese domestic firms. We further deepen the study specifically in exporting sectors in order to question the role that export processing firms, especially foreign-owned ones, could play in driving productivity and wage dynamics of Vietnam. Particularly, the thesis is structured in three chapters as follows.

In chapter 1, we propose to focus on the question of how to promote FDI inflows in developing countries by examining the causality links between FDI and Official Development Assistance (ODA) flows. We attempt to check whether the relationship between FDI and ODA is more likely to be complementary or substitutable. We follow Selaya and Sunesen (2012) in expanding the Solow (1957) model for a small open economy to investigate the impacts of ODA on FDI. Following Kimura and Todo (2010), we estimate our model by Instrumental Variables (IV) methods. Indeed, our preferred model is the *System-GMM* (S-GMM) estimator proposed by Blundell and Bond (1998) which uses additional moment conditions. We use the panel data broken down by industry across 32 developing countries during 8 years from 2003 to 2010. Our statistical analyses confirm that FDI represents the major external financing source for developing countries. Distinguishing FDI by two broad categories, we see that FDI are more concentrated in the physical capital while ODA is more intensive in complementary inputs. Furthermore, new Asian emerging economies seem to be the most attractive destinations of ODA in complementary inputs<sup>5</sup> as well as FDI. Among these countries, Vietnam is considered as a typical case to study. Regarding empirical evidence, our results at the aggregate level support the view that the substitutable effect of ODA on FDI overbalance its complementary effect. This finding is consistent with the previous findings of Caselli and Feyrer (2007) and Beladi and Oladi (2006) but contrasts with the results of Asiedu et al. (2009), Blaise (2005) and Selaya and Sunesen (2012).

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<sup>5</sup>ODA in education, health, water supply, banking, urban development, research/scientific institutions...For the full definition, see Section 1.6 in Chapter 1.

That is to say, the nature and extent of the relationship (complementarity or substitution/positive or negative) can differ from one country to another. At the cross-sectoral level, our results strongly support the hypotheses that ODA invested in complementary inputs ( $ODA_A$ ) complements FDI invested in physical capital ( $FDI_K$ ) while ODA financed to physical capital sectors ( $ODA_K$ ) substitutes private foreign investments. However, unlike with the assumption proposed by Selaya and Sunesen (2012), we show that there is not enough evidence to conclude ODA in physical capital crowds out one by one FDI in the same stand. Further examining the composition of FDI, we also see that FDI invested in complementary inputs has the same behavior as its counterpart ODA. We then suggest that FDI in complementary sectors strengthen more the efficiency of FDI in physical capital sectors. In addition, we also find that the quality of governance (Kaufmann index) represents an indirect determinant rather than a direct determinant of  $FDI_K$  as the significance of estimated coefficient  $FDI_K$  will be merely changed once we control for the interaction effect between Kaufmann index and  $ODA_K$ . In short, our empirical findings suggest the recommendation of investing ODA in complementary inputs which allows increasing the accumulation and efficiency of foreign investments in developing countries.

In chapter 2, by using micro panel data for firms located in a small development country as Vietnam, we seek to verify differences in corporate performance between foreign-owned firms<sup>6</sup> and domestically-owned firms in manufacturing sectors. Our data comes from the Annual Survey on Enterprises (ASOE) provided by the General Statistics Office (GSO) of Vietnam which covers all registered firms in Vietnam over the period from 2000 to 2013. The ASOE data has the following advantages. First, the survey is comprehensive (all registered firms are covered, without size threshold, at the exception of Household business activities). Second, it includes relevant accounting information on outputs, inputs, and exports. Finally, it includes key information which allows us to identify both the ownership of the firm and the

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<sup>6</sup>In this dissertation, for simplicity we denote as "foreign-owned firms" or "foreign firms" those firms which are either purely foreign-owned firms or multinationals.

type of trade firms are involved in. In summary, after the cleanup, our sample consists of about 194,900 manufacturing firms over the period 2000-2013. According to Kimura and Kiyota (2007), we check the differences in characteristics between foreign firms and domestic firms both in *static aspects* including basic indicators such as profitability (returns on assets, ROA, and returns on equity, ROE), productivity (value-added and TFP), and other characteristics such as the size of firm; and in *dynamic aspects* by testing whether potentially profitable firms become foreign-owned firms through M&A or not. To examine this, the dynamic analytical framework developed by Roberts and Tybout (1997) and Bernard and Jensen (2004) will be handled. We test the working assumption that MNCs outperform domestic firms and achieve faster growth. We also check whether potentially domestic profitable firms are more likely to be acquired and whether acquired firms are likely to survive more effectively in the Vietnamese market than domestic firms. The most striking features of this chapter are threefold. First, we provide evidence confirming that foreign-owned firms outperform domestic owned firms in terms of productivity but under-perform these latter in terms of profitability. This evidence is consistent with the phenomenon called *transfer mis-pricing* that may underestimate the real profitability of foreign-owned firms causing the bias of our estimation. Second, we find that foreign-owned firms grow faster than domestic firms in all margins of performance. Nonetheless, once we control for the effects of firm size and R&D spending/Sales, foreign-owned firms become less profitable than domestic firms. Third, when checking the survival of foreign-owned firms in comparison with Vietnamese firms, we see that foreign-owned firms seem to survive better on the Vietnamese market than domestic firms. Respecting policy intervention, we demonstrate two major concerns that Vietnamese policy makers must deal with: the first one is the transfer-pricing within MNCs and the second one is the sunk cost, suggesting the rigor of investment laws, as well as the transparency of the investment environment, should be increased in order to keep Vietnam as an attractive destination for FDI.

In chapter 3, relying on the same database used in chapter 2, we test as our starting point different patterns of firm export intensities between developed countries and developing ones. Basically, while the distribution of firm export intensities is monotonically decreasing in all developed countries, it has proved to be U-shaped in some emerging economies, especially the ones which take a large part in Global value chains (GVC) as China, Mexico...Then, we investigate whether this U-shaped pattern also holds for Vietnam. Our sample consists in about 24,000 manufacturing firms on average over the period 2010-2013 with 6,300 manufacturing firms in 2000 as the reference year. To examine the export premia differentiating ordinary and export processing exporters, we start with non-parametric measures by defining export premia as systematic differences in *some* characteristics of exporting firms compared to non-exporting ones, that are over and above mere industry effects, year-specific effects or cohort effects. We then estimate the export *premia* parametrically by regressing some of the firm characteristics over their export status discriminating ordinary and processing exporters. In our preferred specification, we introduce industry, year and cohort fixed effects and also control for size, ownership, and capital intensity. As for our dependent variables, our main variables of interest are TFP, labor productivity, capital productivity and average wage per worker. We reveal new evidence indicating that processing firms are *less productive and pay lower wages* than their non-processing counterparts (even sometimes than non-exporting firms). This anomalous pattern is more striking for foreign-owned firms and firms operating in the non-tariff zone (NTZ). These evidences are in contrast to a large series of papers that document the superior productive efficiency of exporting firms compared to non-exporting ones within a large variety of developed countries (Bernard and Jensen (1995, 1999), Clerides et al. (1998), Bernard and Wagner (1997), Aw et al. (2000)) but in line with the findings for China (Lu (2010), Lu et al. (2010), Dai et al. (2016)) and other countries very much involved in GVC. All in all, our results indicate that processing trade is



an outstanding activity that should be investigated separately relative to other types of trade for specifying its contribution to productivity and wages dynamics in emerging economies.

# **Chapter 1**

## **Spillover Effects of Official Development Assistance on Foreign Direct Investment: A Cross- Sectoral Analysis for Developing Countries \***

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\*This chapter is developed based on a joint research with T.A. TU. See Anh and Mai (2012).

## **Abstract**

This chapter aims at studying whether official development assistance (ODA) is a conduct to promote foreign direct investment (FDI) in developing countries. We find evidence that at the disaggregated sectoral level, ODA invested in complementary factors has a positive effect while ODA invested in physical capital has a negative effect on FDI invested in the physical capital even though there is not enough evidence to confirm that is a perfect crowding-out effect. Further investigating the composition of FDI, we also see that FDI invested in complementary inputs has the same behavior as its counterpart ODA. However, at the aggregate level, we show that the effect of total ODA on total FDI is negative showing that the substitutable effect of ODA dominates the complementary effect. This finding might be useful for policy makers, international donors, and firms when setting relevant strategies regarding both FDI and ODA.

**Keywords:** Official development assistance (ODA), foreign direct investment (FDI), aid effectiveness, foreign capital for development, developing countries

**JEL code:** F21, F35, C33

## **1.1 Introduction**

Foreign Direct Investment (FDI) is often presented as a powerful engine for economic growth of the recipient country but harnessing its power is difficult for many developing countries where there is often a lack of capacity in terms of infrastructure, human resources, technologies...To address these capacity constraints, strong government expenditure is essential. In case the government's budget is not sufficient, the outsourcing financial resource could be a good compensation. Obviously, this financing method could bring an optimum resolution: using the Official Development Assistance (ODA) as a tool to promote FDI and economic growth, especially for developing countries.

In addition to financing humanitarian needs, the other principal objective of ODA is to promote the social and economic development of recipient countries. Traditional ODA flows, therefore, tend to be invested in social infrastructure (such as education, health, population...) and in economic infrastructure (such as transport, communication, energy...). In contrast, the objective of FDI is seeking benefits for companies. That means FDI is targeting production in mining operations, manufacturing, producer services and infrastructure services. Another difference point between ODA and FDI is that based on its tasks, ODA are dependent upon the extent of recipients' needs in terms of development assistance and its ability to use the assistance in effective ways, rather than its locational advantages economically compared to other countries, meanwhile the ability of countries to attract FDI depends on its locational advantages (market size, abundant resources ...). In this paper, we raise the issue of how a country can use ODA to increase FDI flows. We know that with the help of ODA, social and economic infrastructure can be improved. On one side, a good quality of economic infrastructure directly contributes to attracting more private foreign investments. On the other side, ODA contributes to reform the quality of social infrastructure. In turn, a high quality of social infrastructure, for instance, the workforce, information policies, procedures,

institutions...encourages an increase of productivity, therefrom a growth in private sectors. Nowadays, ODA and FDI have extended their activities not only in their traditional sectors (i.e, ODA invested rather in infrastructure while FDI invested rather in production sectors) but also in sectors which are priorities of each other. That means FDI and ODA could switch their place. In other words, we can see the presence of FDI in infrastructural sectors and ODA in productive sectors. Therefore, we suggest that, by direct or indirect channel, ODA and FDI could have a complementary relationship.

Actually, the idea of using ODA as a vector of trade promotion is already developed not only by recipient countries but also by development assistance agencies <sup>1</sup>. Recognizing that international trade (including mostly private sectors) might play a positive role in promoting economic growth and development of developing countries, aid agencies have led the call for more and better aid for trade with the aim of generating support for developing countries to build the supply-side capacity and trade-related infrastructure they need to strength the private sectors; thence more integrate, benefit and broadly attract trade flows from global markets. Indeed, since the *Aid for Trade Initiative* was launched by World Trade Organization (WTO) in 2006, cumulative aid-for-trade disbursements reached USD 245 billion and an additional USD 190 billion in other official flows. Aid-for-trade commitments stood at USD 55.4 billion in 2013, an additional USD 30 billion or 118% increase in real terms compared to the 2002-05 baseline average. This has raised the share of aid for trade in sector-allocable aid to 38.4% in 2013 from an average 32.5% during the baseline period. According to a broad range of trade and development literature, aid for trade is effective at both the micro and macro level. More specifically, OECD research found that one dollar extra invested in aid for trade generates nearly eight additional dollars of exports from all developing countries – and twenty dollars for the poorest countries(Lammersen and Roberts

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<sup>1</sup>Following the definition stated by WTO (2006), *Aid for trade is about assisting developing countries to increase exports of goods and services, to integrate into the multilateral trading system, and to benefit from liberalized trade and increased market access.*

(2015)). In short, recall the idea of Nurkse (1967) who believes that "a country is poor because he is poor". This is a really a vicious circle for most least developing countries (LDCs). According to Assidon (2002), to break this circle, "the support of external assistance was needed (...)". To argue, she said that "Europe itself had she not resorted to the Marshall Plan to reboot its growth after the war?"

On the empirical side, the relationship between aid and FDI appears to be controversial and literature on this underlying relation remains inconclusive. According to Selaya and Sunesen (2012), this type of mixed empirical results can be explained to a large extent by the high level of aggregation used for the aid variable. For example, Karakaplan et al. (2005) includes only overall aid. Harms and Lutz (2006) distinguish between grants, technical cooperation grants, as well as bilateral and multilateral aid. Kimura and Todo (2010) apply the idea of different types of aid but do not implement an effective disaggregation.

There exist two major shortcomings in this literature. Firstly, none of the existing papers consider FDI at the disaggregated level. Secondly, there is the lack of a supporting theoretical model. To the best of our knowledge, until now, only two papers analyze theoretically the relationship between aid and FDI. The first one is Beladi and Oladi (2006) that set up a general equilibrium model where all foreign aid is used to finance public goods, but where they, unfortunately, do not consider any further disaggregation for the aid flows nor make an empirical analysis. The second and most noticeable one is Selaya and Sunesen (2012) that developed a theoretical model explaining the ambiguous relation between aid and FDI and test the relationship between aid and FDI distinguishing between aid directed toward complementary factors of production ( $ODA_A$ ) and aid invested in physical capital ( $ODA_K$ ). They suppose that, first, for a given level of domestic saving,  $ODA_K$  crowds out other types of foreign investments in physical capital, one for one; second,  $ODA_A$  has an ambiguous net effect on FDI.

The originality of our paper is to fill in exactly these two shortcomings. First, we modify Selaya and Sunesen (2012)'s theoretical model by introducing disaggregated FDI and evaluate theoretically impacts of not only disaggregated ODA but also FDI in complementary factors ( $FDI_A$ ) and FDI in physical capital ( $FDI_K$ ) – the major type of FDI we usually observe. Second, we fit the theoretical framework to selected developing countries' data to shed lights on spillovers effects between aid and FDI at a sectorally disaggregated level within developing countries (Figure 1.1).

Using a panel of 32 developing countries over the period 2003-2010 for which we have disaggregated data, we find a positive effect of  $ODA_A$  on  $FDI_K$  while  $ODA_K$  has a negative effect on  $FDI_K$ . This result is consistent with the finding of Selaya and Sunesen (2012). Furthermore, we find that  $FDI_A$  has the same characteristics as its counterpart ODA. However, we see that at the aggregate level, the effect of total ODA on total FDI is negative implying that the substitutable effect is generally stronger than the complementary effect. This finding is in opposition to the result suggested by Selaya and Sunesen (2012). Summing up, only  $ODA_A$  could play an essential role as a complement to private direct investment, especially in developing countries.

The chapter is organized as follows. Section 1.2 reviews the literature on the relationship between FDI and ODA. The theoretical model is developed in Section 1.3. The empirical model is constructed in section 1.4. Section 1.5 presents our estimation method. Data is overviewed in section 1.6. Empirical results are discussed in section 1.7. Conclusion remarks finalize the paper.

## **1.2 Literature background**

There are a few studies that examine the relationship between foreign aid and FDI by using cross-country panel data. As far as we know, only around ten papers exploit this topic empirically. The research results are controversial or inconclusive as indicated in Figure 1.1. The main finding of these studies is that there are no effect or effect of total foreign aid on total FDI are ambiguous (Karakaplan et al. (2005), Harms and Lutz (2006), Boone (1996), Kosack and Tobin (2006), Kimura and Todo (2010)). Karakaplan et al. (2005) find an insignificant effect of aid on FDI. However, they suggest that good governance and developed financial markets are able to lead to a positive effect of aid. Harms and Lutz (2006) also find that the effect of aid on FDI is generally insignificant but in contrast to the finding of Karakaplan et al. (2005), they show that the effect of aid is significantly positive for countries in which private agents face heavy regulatory burdens. Boone (1996) argues that aid does not significantly increase investment, nor benefit poor countries as measured by improvements in human development indicators. Kosack and Tobin (2006) continue the idea of Boone (1996) and conclude that aid and FDI are unrelated in poor countries. They further emphasize that aid contributes powerfully to both economic growth and human development. By contrast, FDI has no effect on economic growth; it makes sense that foreign aid and FDI are not substitutes in the development of these economies. Kimura and Todo (2010) also find the evidence suggesting that the total effect of foreign aid on FDI is not substantial. Indeed, their empirical results show that the effect of the total aid on FDI is positive but statistically insignificant. On the other point of view, Selaya and Sunesen (2012), Asiedu et al. (2009) and Blaise (2005) share the idea that total aid has a significant positive impact on FDI. At the aggregated level data, Selaya and Sunesen (2012) conclude that the combined impact of the aid invested in physical capital and aid invested in complementary inputs on FDI is positive implying that more aid should be directed toward inputs complementary to physical



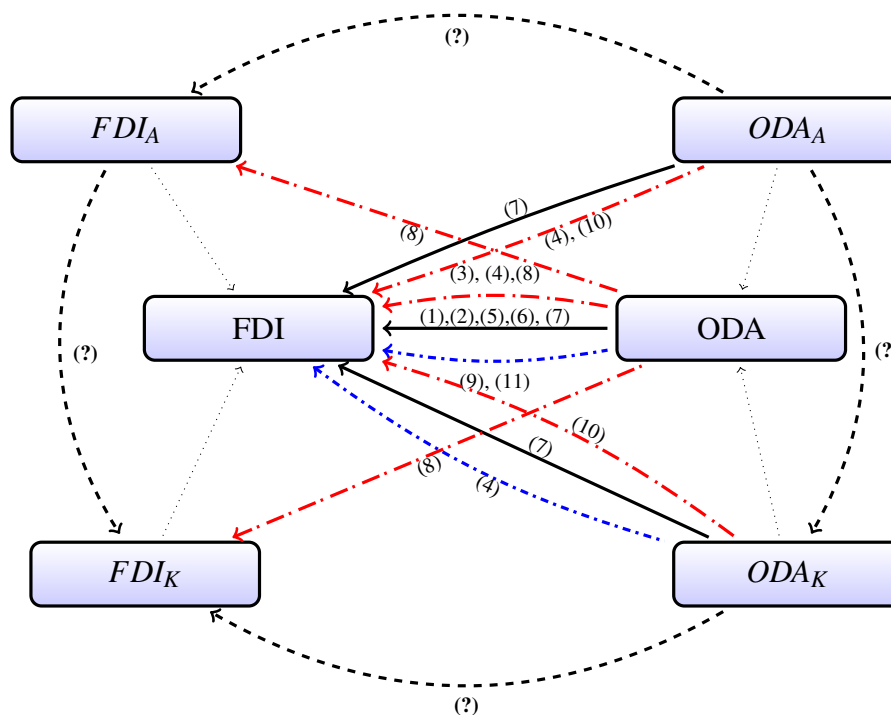
capital to optimize the return on aid. Asiedu et al. (2009) argue that foreign aid mitigates the adverse effect of expropriation risk on FDI. However, aid cannot eliminate the adverse effect of risk. In contrast, Caselli and Feyrer (2007) and Beladi and Oladi (2006) confirm the substitutable relation between foreign aid and FDI. Beladi and Oladi (2006) show that foreign aid causes a substitution of domestic capital for foreign capital and thus a reduction of foreign capital usage. For their part, Caselli and Feyrer (2007) estimate the marginal product of capital (MPK) across countries and find that increasing aid inflows to developing countries will lower the MPK in these countries and will tend to be fully offset by outflows of other types of capital investments. Evidently, that is to say, aid and FDI are closer to being substitutes rather than being complements.

At the less aggregated data level on foreign aid, Kimura and Todo (2010) distinguish between infrastructure and non-infrastructure aid and examine whether each type of aid promotes FDI. Their results show that there is no positive infrastructure effect, no negative rent-seeking effect but a positive vanguard effect (arising when foreign AID from a particular donor country promotes FDI from the same country but not from other countries). Blaise (2005) argues in a different way that bilateral aid flows have a significant positive impact on both non-manufacturing and manufacturing sectors even though this positive effect is shown to be slightly more important for non-manufacturing activities.

Up to now, the most notable study at the disaggregated data level is the research of Selaya and Sunesen (2012). In their paper, they indicate that the effect of total aid on FDI is, in theory, ambiguous because it is the combined effect of aid for physical capital investments and aid to complementary factors. That's why empirical studies that do not disaggregate aid flows tend to find insignificant or ambiguous effects and provides a clear theoretical basis for the idea of examining the role of aid components for its overall level of efficiency. Thus, Selaya and Sunesen (2012) analyze impacts of foreign aid by using disaggregated data and

find a large and positive effect of aid invested in complementary factors while aid invested in physical capital has a negative impact on FDI. Reproducing the empirical model proposed by Selaya and Sunesen (2012), Thangamani et al. (2011) have although get a contradictory result suggesting that both aids in the shape of physical capital and aid for human capital and infrastructure development serve as complementary factors to FDI rather than being substitutable in South Asian economies.

Figure 1.1 Analysis results on the relationship between FDI and ODA



Note:  $FDI = FDI_A + FDI_K$ ;  $ODA = ODA_A + ODA_K$

- : no/ambiguous effect;
- .....→ : complementary (positive) effect;
- . - . - . → : substitutable (negative) effect;
- : relationship to investigate

- |                               |                               |
|-------------------------------|-------------------------------|
| (1) Karakaplan et al. (2005)  | (7) Kimura and Todo (2010)    |
| (2) Harms and Lutz (2006)     | (8) Blaise (2005)             |
| (3) Asiedu et al. (2009)      | (9) Caselli and Feyrer (2007) |
| (4) Selaya and Sunesen (2012) | (10) Thangamani et al. (2011) |
| (5) Boone (1996)              | (11) Beladi and Oladi (2006)  |
| (6) Kosack and Tobin (2006)   |                               |

### 1.3 Theoretical model

To examine the relationship between different types of ODA and FDI flows, we adapt Solow (1957) model for a small open economy. Assume a Cobb-Douglas production function where GDP,  $Y$ , is given by

$$\begin{aligned} Y_t &= A_t f(K, L) \\ &= A_t K_t^\alpha L_t^\beta \end{aligned} \quad (1.1)$$

where  $K$  is the stock of accumulation physical capital at time  $t$ ,  $A$  denotes improvements in Total factor productivity at time  $t$ ,  $L$  is the labor at time  $t$ , with constant returns to scale  $\alpha + \beta = 1$ . Differentiate (1.1) totally with respect to time and divide by  $Y$  and one obtains:

$$\frac{\dot{Y}}{Y} = \frac{\dot{A}}{A} + A \frac{\partial f}{\partial K} \frac{\dot{K}}{Y} + A \frac{\partial f}{\partial L} \frac{\dot{L}}{Y} \quad (1.2)$$

where dots indicate time derivatives. Now define  $w_K = \left( \frac{\partial Y}{\partial K} \frac{K}{Y} \right)$  and  $w_L = \left( \frac{\partial Y}{\partial L} \frac{L}{Y} \right)$  the relative shares of capital and labor<sup>2</sup>. Then, we can rewrite (1.2) as:

$$\frac{\dot{Y}}{Y} = \frac{\dot{A}}{A} + w_K \frac{\dot{K}}{K} + w_L \frac{\dot{L}}{L} \quad (1.3)$$

Here is an exogenous growth model where an increase in  $Y$  could come from one of three sources: total factor productivity ( $A$ ), accumulation physical capital ( $K$ ) or labor ( $L$ ).  $K$  could be financed by domestic and foreign investments while  $A$  includes any factor complementary to the accumulation of physical capital such as new technologies and better institutions. Assume that the total flow of foreign aid (ODA) and foreign direct investment (FDI) can be split into parts invested in complementary factors ( $ODA_A, FDI_A$ ) and parts invested in physical capital ( $ODA_K, FDI_K$ ) so that  $ODA = ODA_A + ODA_K$  and  $FDI = FDI_A + FDI_K$ .

<sup>2</sup>Note that  $MPK = \frac{\partial Y}{\partial K} = A \frac{\partial f}{\partial K}$  and  $MPL = \frac{\partial Y}{\partial L} = A \frac{\partial f}{\partial L}$  where  $MPK$  and  $MPL$  are the marginal product of capital and the marginal product of labor respectively.

The parts invested in complementary factors,  $ODA_A$ ,  $FDI_A$  raise the marginal productivity of all production factors that are complementary to physical capital.  $ODA_A$  and  $FDI_A$  help for instance to finance infrastructure investments that lead to the interconnection of markets, or investments in human capital improve technology adoption. On the other hand, ODA and FDI invested in physical capital ( $ODA_K$ ,  $FDI_K$ ) enter the production function only through its effect on physical capital accumulation and has no (augmenting) effect on total factor productivity. To model the augmenting effect of complementary ODA and FDI on all production factors that are complementary to physical capital, we allow the flows of  $ODA_A$  and  $FDI_A$  to increase the existing stock of A ( $A_0$ ) in the economy:

$$A = A_0 + ODA_A + FDI_A \quad (1.4)$$

Giving complementary ODA as well as FDI to have a direct impact on A is for the idea that  $ODA_A$  and  $FDI_A$  have an augmenting effect on any production factor other than K (i.e. human capital, public investments, new technology, etc.) and, thus, it is ultimately able to increase the Marginal product of capital (MPK). We assume an open economy, therefore capital equipment is financed by (i) domestic savings ( $S=sY$ , where  $s$  is a given savings rate); (ii) the part of FDI invested in physical capital ( $FDI_K$ ) and (iii) the part of ODA invested in physical capital ( $ODA_K$ ). Then, the capital accumulation is given by

$$\begin{aligned} \dot{K} &= S + FDI_K + ODA_K - (n + \delta)K \\ &= sY + FDI_K + ODA_K - (n + \delta)K \end{aligned} \quad (1.5)$$

where  $n$  is the population growth rate and  $\delta$  is a fixed depreciation rate. With perfect capital mobility, the world real rate of return,  $r^w$ , pins down at any point in time the net return to capital ( $MPK - \delta$ ), and thus

$$r^w = MPK - \delta = A\alpha K^{\alpha-1} - \delta \quad (1.6)$$

According to (1.6), the steady state level of  $K$  at any point in time is given by

$$K^* = \left[ \frac{A\alpha}{r} \right] \frac{1}{1-\alpha} \quad (1.7)$$

where  $r$  is defined as a gross world real rate of return,  $r^w + \delta$ . Rewriting (1.5) taking (1.7) as given, the flow of  $FDI_K$  is determined as the residual:

$$FDI_K = -ODA_K - sY^* + (n + \delta)K^* \quad (1.8)$$

where  $Y^* = AK^{*\alpha}L^\beta$ . Following Selaya and Sunesen (2012), for a given level of domestic savings, equalization between MPK and  $r$  requires an increase in ODA to be accommodated by a proportional reduction in FDI. That means  $\frac{\partial FDI_K}{\partial ODA_K} = -1$ . However, this type of relationship only holds for ODA invested in physical capital while the effects of complementary ODA has two components:  $-s \frac{\partial Y^*}{\partial ODA_A}$  and  $(n + \delta) \frac{\partial K^*}{\partial ODA_A}$ . At a first glance, we see that complementary ODA has a positive effect on domestic savings and thereby on domestically financed capital investments because  $ODA_A$  alters the production function and thus increases the steady state levels of income and domestic savings. That means the corresponding increase in domestically financed investments causes a proportional reduction of size  $-s \frac{\partial Y^*}{\partial ODA_A}$  in the need for  $FDI_K$ . Secondly,  $ODA_A$  has also a positive effect on the steady state capital stock as the augmenting effect of  $ODA_A$  on TFP (A) improves the MPK and allows to increase the capital stock. In particular, for a given of  $s$ , ODA invested in complementary factors allows a sustainable increase in  $FDI_K$  equal to  $(n + \delta) \frac{\partial K^*}{\partial ODA_A}$ . By similar arguments, we get the same results for  $FDI_A$ . Hence, the empirical relationship

between ODA and FDI is not monotonic:

$$\begin{aligned}
 dFDI_K &= \frac{\partial FDI_K}{\partial ODA_K} dODA_K + \frac{\partial FDI_K}{\partial ODA_A} dODA_A + \frac{\partial FDI_K}{\partial FDI_A} dFDI_A \\
 &= -1 - s \frac{\partial Y^*}{\partial ODA_A} + (n + \delta) \frac{\partial K^*}{\partial ODA_A} - s \frac{\partial Y^*}{\partial FDI_A} + (n + \delta) \frac{\partial K^*}{\partial FDI_A} \quad (1.9) \\
 &= -1 - s \left( \frac{\partial Y^*}{\partial ODA_A} + \frac{\partial Y^*}{\partial FDI_A} \right) + (n + \delta) \left( \frac{\partial K^*}{\partial ODA_A} + \frac{\partial K^*}{\partial FDI_A} \right)
 \end{aligned}$$

The above equation holds several implications. First and the most obviously,  $ODA_K$  and  $FDI_K$  are substitutes ( $\frac{\partial FDI_K}{\partial ODA_K} = -1$ ). Second, since  $ODA_A$  and  $FDI_A$  are perfect substitutes, its impacts on  $FDI_K$  are in the same direction. Since  $-s \left( \frac{\partial Y^*}{\partial ODA_A} + \frac{\partial Y^*}{\partial FDI_A} \right)$  and  $(n + \delta) \left( \frac{\partial K^*}{\partial ODA_A} + \frac{\partial K^*}{\partial FDI_A} \right)$  work in opposite directions, the sign of the second and third effects will be ambiguous and will need to be estimated empirically. The total impacts of three effects on  $FDI_K$  are therefore indeterminate and there is room for empirical works to withdraw the final conclusion:

$$dFDI_K = \frac{\partial FDI_K}{\partial ODA_K} dODA_K + \frac{\partial FDI_K}{\partial ODA_A} dODA_A + \frac{\partial FDI_K}{\partial FDI_A} dFDI_A \lesseqgtr 0 \quad (1.10)$$

If mobility of capital is imperfect, MPK should be allowed to deviate from the gross world interest rate by a risk-premium,  $\rho$ , that reflects idiosyncratic country characteristics. In this case, the first-order condition in (1.6) should read

$$r + \rho = MPK \quad (1.11)$$

and the capital stock in (1.7) should be redefined accordingly:

$$K^* = \left[ \frac{A\alpha}{r + \rho} \right] \frac{1}{1 - \alpha} \quad (1.12)$$

While this renders the effect of ODA invested in physical capital unchanged, the effect of complementary ODA and FDI become somewhat more complicated. The risk premium impact FDI directly through (1.12) but, given that the marginal effect of  $ODA_A$  and  $FDI_A$  will also depend on the risk premium and thus on country-specific characteristics.

## 1.4 Empirical model

In order to investigate the above theoretical model, we derive the relationship between ODA and FDI as taking the following reduced form:

$$FDI_K = f(FDI_A, ODA_K, ODA_A, \mathbf{X}) \quad (1.13)$$

To explain  $FDI_K$ - the amount of FDI invested in physical capital in a country, we expect the impacts of  $ODA_K$ - the amount of ODA invested in physical capital,  $ODA_A$  and  $FDI_A$ - the amount of ODA and FDI respectively invested in complementary factors. On the other side; other determinants of the level of physical capital in the country, correlates of FDI and some measure of initial economic conditions all reflected in vector  $\mathbf{X}$  (like the level of gross domestic savings-  $S$ , the rate of population growth-  $n$ , the inflation rate-  $INFLA$ , the balance of payments-  $BOP$ , etc.). In a panel setting, the econometric interpretation of this ODA-FDI relationship is:

$$FDI_{it}^K = \beta_0 + \beta_1 A_{0,it} + \beta_2 S_{it} + \beta_3 n_{it} + \beta_4 FDI_{it}^A + \beta_5 ODA_{it}^K + \beta_6 ODA_{it}^A + u_{it} \quad (1.14)$$

where  $FDI_{it}^K$  is the inward flow of FDI to country  $i$  during period  $t$ ;  $A_{0,it}$  is the overall productivity level at the beginning of period  $t$ ;  $FDI_{it}^A$  and  $ODA_{it}^A$  are FDI and ODA invested in complementary factors;  $ODA_{it}^K$  is ODA invested in physical capital;  $S_{it}$  and  $n_{it}$  are domestic



savings and population growth respectively which are determinants of the level of physical capital; and  $\beta_0$  is a constant term capturing all time-invariant factor. Following Selaya and Sunesen (2012), we add firstly to our specification GDP as the initial level of productivity which is a strong proxy for time-varying initial conditions in each country, so that  $A_{0,it} = \beta_0 + GDP_{it}$ . If we make this assumption and pool the data, we can estimate:

$$FDI_{it}^K = \beta_0 + \beta_1 GDP_{it} + \beta_2 S_{it} + \beta_3 n_{it} + \beta_4 FDI_{it}^A + \beta_5 ODA_{it}^K + \beta_6 ODA_{it}^A + u_{it} \quad (1.15)$$

With the purpose of checking the effects of the quality of governance on FDI, we follow Harms and Lutz (2006), Karakaplan et al. (2005) and Kimura and Todo (2010) by using governance indicators taken from the dataset developed by Kaufmann et al. (2010). More specifically, in this paper, we use the sum of six indexes for the level of voice and accountability, the political stability, the government effectiveness, the regulatory quality, the rule of law and the control of corruption denoted as *Kaufmann index*. This index is normalized so that the minimum is 0 with a higher score indicating a higher level of governance. We then include the interaction term between total ODA flows ( $ODA_A + ODA_K$ ) and Kaufmann index denoted as  $ODA\_Kaufmann (= \ln(ODA * Kaufmann))$ . We also assume that exists a partial correlation between  $ODA_A$  and  $FDI_A$ . To capture this effect, we add on the right hand side of (1.15) the interaction term between  $ODA_A$  and  $FDI_A$  denoted as  $FDI_A\_ODA_A (= \ln(FDI_A * ODA_A))$ . In addition, we include the Balance of Payments (BOP) to test its impact on the attractiveness of FDI as we believe that a country with a *current account deficit* would have to be financed by a net inflow in the capital and financial account while a *current account surplus* should correspond to an out flow in the capital and financial account for a net figure of zero. We employ the current account of the Balance of payments which includes transactions in goods, services, investment income and current transfers. Finally, following Asiedu et al. (2009), we include Inflation rate as a measure of macroeconomic instability. According to Solow (1957)'s model and as suggested by (Nunnenkamp (2002), Asiedu et al.

(2009)), the population is also added to capture differences in country size. Thus our baseline model has the form as:

$$\begin{aligned}
 \ln FDI_{it}^K = & \beta_0 + \beta_1 GDP_{it} + \beta_2 S_{it} + \beta_3 n_{it} + \beta_4 \ln FDI_{it}^A + \\
 & \beta_5 \ln ODA_{it}^K + \beta_6 \ln ODA_{it}^A + \beta_7 ODA_A\_FDIA_{it} + \\
 & \beta_8 ODA\_Kaufmann_{it} + \beta_9 BOP_{it} + \beta_{10} INFLA_{it} + \\
 & \beta_{11} POP_{it} + u_{it}
 \end{aligned} \tag{1.16}$$

Selaya and Sunesen (2012) consider that the relationship between  $ODA_K$  and FDI (and savings) is linear while the relationship between  $ODA_A$  and FDI is non linear since they include scale effects of  $ODA_A$  denoted as the square term of  $ODA_A$  in their model. Different from them, we believe that in stead of scale effects, the spillover effects between  $ODA_A$ ,  $FDI_A$ ,  $ODA_K$  and  $FDI_K$  are more crucial. By concentrating on these effects, we don't add further scale effects of  $ODA_A$  because this raises the risk of high multicollinearity in the model and thus we estimate our model as a linear model. However, following (Kimura and Todo (2010)), we take the log of all FDI and ODA variables to dropping their negative observations.

We expect  $\beta_1$  to be positive because we believe that the higher productivity improves the higher demand for FDI. On the other hand, we expect  $\beta_2$  to be negative as a high level of domestic savings turns down the need for foreign investment.  $\beta_3$  and  $\beta_{11}$  should be positive since a fast growing population diminishes the stock of capital, hence, requires the complement of capital from other sources such as FDI. Basing on theoretical analysis,  $\beta_5$  should have a negative sign. Furthermore, in the case where capital mobility is unrestricted perfectly,  $ODA_K$  would crowd out  $FDI_K$  one by one. That means  $\beta_5$  should be closed to -1. We do not have any expectation for the sign of  $\beta_6$  since, from theoretical analysis, its effect on  $FDI_K$  is ambiguous. That's also the expectation for the sign of  $\beta_4$  and  $\beta_7$  because  $FDI_A$  might have the same role according to  $ODA_A$ , the mixed effect between them, therefore,

might be more exaggerated. By contrast, the interaction term between ODA and governance index should be positive as we believe that a better quality of governance help to raise the attractiveness of FDI. Finally, we expect  $\beta_9$  and  $\beta_{10}$  to be positive since "poorer countries and countries with a large debt burden will receive more aid" (Asiedu et al. (2009)).

## 1.5 Estimation method

As discussed above, we start with the first step with ordinary least squares (OLS) estimation as a baseline. OLS estimators are consistent only when all regressors are orthogonal to the error term. However, many existing studies show evidences of the endogeneity of foreign aid variables in income-growth regression and therefore OLS estimators are quietly different from estimators correcting of endogeneity (Hansen and Tarp (2001), Burnside and Dollar (2000), Boone (1996)). Following Kimura and Todo (2010), it is highly probable that foreign aid variables are also endogenous in FDI regression since income growth and FDI flows are likely to be determined simultaneously. Thus, in order to mitigate biases due to the endogeneity, we estimate our specification by Instrumental Variables (IV) methods. Particularly, we first use Two-stage least squares (2SLS) model where instrumented variables including  $\ln FDI_A$ ,  $\ln ODA_K$ ,  $\ln ODA_A$ ,  $ODA\_Kaufmann$  and  $FDI_A\_ODA_A$  while exogenous instruments including lag of  $\ln FDI_A$ , lags of own ODA variables, first difference of S (DS) and of GDP (DGDP), population growth rate (n), balance of payment levels (BOP), inflation rates (INFLA) and population levels (POP). We next estimate our specification (1.17) by 2SLS model controlling for fixed effects and random effects. After that, a Hausman (1978) test is followed to select the most appropriate model. Finally, as we know that recently GMM estimator proposed by Arellano and Bond (1991) seems to be the most relevant econometric technique for the linear dynamic panel data (DPD) model, we thus also perform GMM approach in our work. This estimator often referred to the *Difference-GMM*

(D-GMM) estimator using lagged values of first differences of endogenous variables as instruments. However, as pointed out by Arellano and Bover (1995), lagged levels are often poor instruments for first differences. This problem can be reduced by using *System-GMM* (S-GMM) estimator proposed by Blundell and Bond (1998) which uses additional moment conditions. In brief, our preferred model is S-GMM panel model because of following reasons:

- S-GMM estimator has an advantage over D-GMM in variables which are "random-walk" or close to being random-walk variables. If the model specification includes macroeconomic variables, which are considered as the presence of random walk statistical generating mechanisms, S-GMM approach seems to be a more appropriate choice. (Efendic et al. (2011))
- In general, S-GMM approach generates more accurate and efficient estimators compared to D-GMM by increasing precision and reducing the finite sample bias (Baltagi (2013)).
- If we work with an unbalanced panel then it is better to avoid D-GMM estimation which has a weakness of magnifying gaps (Roodman (2006)). Our panel is close to being unbalanced. Hence, our preferred choice is S-GMM.

Nevertheless, there are two important points to be made about using S-GMM. First, in a panel with fixed effects including level equation, requires a new assumption- first differenced instruments used for variables in levels should not be correlated with unobserved country effects. Thus, some authors prefer to include in level equation only variables which are uncorrelated with fixed effects. Second, because S-GMM uses more instruments than D-GMM, it may not be appropriate if these instruments are invalid or weak. Hence, it should try to limit the number of instruments used in the model. Consequently, we decided to use instruments only for the level equation of endogenous variables and for the first-difference

equation of exogenous variables. These instruments are restricted by lags from 0 to 4<sup>3</sup>. In addition, since our model calls for a constant which captures all time-invariant factors, we add the constant in S-GMM model. Finally, for each regression, we test for autocorrelation and also check the validity of instruments.

## **1.6 Data**

In this section, we describe our dataset. We begin by presenting data source, data cleaning and sample selection. We then overview our sample by analyzing parametric statistics.

### **1.6.1 Data source, data cleaning and sample selection**

ODA are total real net flows of Official Development Assistance disbursements, taken from The Query Wizard for International Development Statistics (QWIDS)<sup>4</sup>. QWIDS database includes aid-for-trade statistics from 2002 onwards (i.e. volume, origin, and aid categories for over 150 developing countries and territories, including project-level information), based on flows reported to the Creditor Reporting System (CRS). Indeed, aid for trade comprises five categories: technical assistance for trade policy and regulations; trade-related infrastructure; productive capacity building, including trade development; trade-related adjustment and other trade-related needs. In our study, we focus only on aid for trade-related infrastructure and aid for the productive capacity-building. We exclude other sector aid categories because "they are primarily oriented to provide fiscal budget support in the recipient country" (Selaya

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<sup>3</sup>We have checked deeper lags in order to look for more appropriate instruments. However, regression results were not better so that we constrained lags between 0 and 4.

<sup>4</sup>The data can be accessed at <https://stats.oecd.org/qwids/>

and Sunesen (2012)). ODA is disintegrated into two broad categories relying on the sectoral disaggregation from OECD's Aid activity database<sup>5</sup>:

- *ODA in physical capital, ODA<sub>K</sub>*: ODA contributed directly to productive sectors including banking, business, and production (agriculture, manufacturing, trade, tourism...)
- *ODA in complementary inputs, ODA<sub>A</sub>*: ODA in social infrastructure (such as education, health, water supply...), economic infrastructure (such as banking, business) and multi-sector (such as environment protection, urban development, research/scientific institutions...)

FDI are total net inward flows of FDI broken down by industry and country. FDI data are taken from the International Trade Centre (ITC)'s foreign direct investment database<sup>6</sup>. To decompose FDI into two broad categories, we refer to OECD's sectoral classification of ODA, so that:

- *FDI in physical capital, FDI<sub>K</sub>*: is defined as the part of FDI oriented directly to productive sectors including primary sectors, secondary sectors and some of the tertiary sectors such as construction, wholesale and retail trade, hotels and restaurants, finance, business activities...<sup>7</sup>
- *FDI in complementary inputs, FDI<sub>A</sub>*: is defined as the part of FDI oriented to social infrastructure including the rest of tertiary sectors such as electricity, gas and water, transport, storage and communications, education, health and social services...<sup>8</sup>

FDI's dataset of ITC has some limitations. The first problem is due to the combination of data coming from various sources and reconciled in the ISIC rev.3 nomenclature. This can

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<sup>5</sup>For details on OECD's Aid for trade sector codes and aid's disaggregation according to its purpose of investment, see <http://www.oecd.org/dac/aft/Aid-for-trade-sector-codes.pdf>

<sup>6</sup>The data can be accessed at <http://www.intracen.org/itc/market-info-tools/foreign-direct-investment/>.

<sup>7</sup>see Table B1. for details

<sup>8</sup>see Table B1. for details

lead to inaccurate industry classification. Such problems concern primarily data on FDI. FDI data cannot be always allocated accurately to a given industry and therefore it becomes necessary to assign these data to an additional industry (not defined in the ISIC nomenclature) such as "unspecified secondary" or "unspecified wholesale trade". However, this problem is likely to be small as we expect FDI at a more aggregated level by decomposing FDI on sectoral levels into two broad categories. Hence, these two major categories still capture main characteristics of  $FDI_A$  and  $FDI_K$  as the purpose of our analysis. In addition to the classification problem, there are other data problems, which are more specific to each type of data. FDI data are collected from National Banks and enterprise surveys. FDI flows are difficult to capture accurately (like trade in services data) by their nature, i.e. due to the intangibility of the financial flows. However, unlike trade in goods, which capture many relatively small size transactions, FDI data are characterized by fewer large size transactions, making them more sensitive to the accurate recording of these large observations (ITC). Finally, ITC focuses on data broken down by industry. However, industry-specific FDI data are not always available or take some time to be reported or collected. Therefore, our sample size is reduced due to the unavailability of FDI variable values.

Main control variables are GDP, population growth rate, gross domestic savings, and population, which are taken from the World Bank's *World Development Indicators 2016* (WDI)<sup>9</sup>. Other control variables are current account balance (BOP) and inflation rate, which are taken from the International Monetary Fund's *World Economic Outlook Database, April 2015*<sup>10</sup>. Kaufmann index is compiled from The Worldwide Governance Indicators (WGI) project<sup>11</sup>.

We use the natural logarithm of FDI and ODA variables, after adding 0.01, while other variables are kept at level. To construct real FDI, GDP, Savings (S) and Balance

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<sup>9</sup>The data can be accessed at <http://databank.worldbank.org/data/>

<sup>10</sup>The data can be accessed at <https://www.imf.org/external/pubs/ft/weo/2015/01/weodata/index.aspx>

<sup>11</sup>The data can be accessed at <http://info.worldbank.org/governance/wgi/>

of payment (BOP) values, their nominal values are divided by US GDP deflator of the corresponding year, for which the base year is 2013, compiled from the WDI. The unit of population is millions of persons; the unit of the inflation rate and Population growth is annual percent change; the unit of FDI, ODA is 2013 USD millions and the unit of GDP, Savings, BOP is 2013 USD billions.

It should be reminded that although the sectoral data on ODA are available for a broad group of developing countries across years, FDI data are not always available. Therefore, our sample size is narrow. Actually, we examined the availability of FDI data for 198 developing countries following the list proposed by ITC<sup>12</sup>. However, there are only 34 countries of which FDI sectoral data are available from 2001 to 2012 even though this time-window can change across countries. For instance, FDI data of Myanmar, Brazil, El Salvador, Armenia...are available from 2001 to 2010 while FDI data of other countries as Philippines, Vietnam, Mexico, India...are available from 2003 to 2012. Therefore, our sample is furthermore restricted. Overall, our sample consists of 36 countries from 2003 to 2010 due to limitations in the availability of variables.

In order to get a feasible dataset, data cleaning and verifiability of the model specification are necessary. Firstly, we keep only countries with no missing values on  $FDI_A$ ,  $FDI_K$ ,  $ODA_A$ ,  $ODA_K$ . Secondly, we run a baseline regression with Ordinary least square (OLS) estimation to check possible diagnostics that our data, as well as our model, might deal with. This is a prerequisite step to help model building and to select appropriate estimation methods. By examining the studentized residuals for identifying outliers, we see that Croatia and Paraguay are the most worrisome observations since they both have large residuals and

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<sup>12</sup>This list is based on ITC's activities and country programs. All countries and territories are included except members of the European Union (EU) and of the Organization for Economic Co-operation and Development (OECD). However, OECD members as, Mexico, Turkey, Republic of Korea and Chile, where ITC is still active with country programs, are also included in the list. The list can be accessed at [http://www.investmentmap.org/country\\_developing.aspx](http://www.investmentmap.org/country_developing.aspx)



large leverages<sup>13</sup> which are potentially the most influential points. Moreover, they are main factors causing the inaccuracy of normality distribution. We checked out that Croatia and Paraguay have some negative outliers in terms of  $FDI_A$ <sup>14</sup> and many missing values in terms of  $FDI_K$ . Then, we decided to remove them from our dataset. Since we work with a panel dataset, the unit-root test for the stationary of series is required. Results of the unit-root test indicate that the majority of variables in the model (1.16) are stationary except two variables S (savings) and GDP. Therefore, we need to de-trend them by first differencing. That means two variables S and GDP will be replaced by their first differencing variables in the model which has the new form as:

$$\begin{aligned}
 \ln FDI_{it}^K = & \beta_0 + \beta_1 DGDP_{it} + \beta_2 DS_{it} + \beta_3 n_{it} + \beta_4 \ln FDI_{it}^A + \\
 & \beta_5 \ln ODA_{it}^K + \beta_6 \ln ODA_{it}^A + \beta_7 ODA_{A\_FDIA_{it}} + \\
 & \beta_8 ODA\_Kaufmann_{it} + \beta_9 BOP_{it} + \beta_{10} INFLA_{it} + \\
 & \beta_{11} POP_{it} + u_{it}
 \end{aligned} \tag{1.17}$$

where  $DS$  and  $DGDP$  are the first differenced values of S and GDP respectively. Next, we also check for the first autocorrelation AR(1) and the homoscedasticity of residuals. These tests show that our data are characterized by both heteroscedasticity and autocorrelation. Finally, we end up with model specification tests to detect specification errors. The linktest developed by Pregibon (1979) has failed to reject the assumption that our model is specified correctly. Therefore, it seems to us that we don't have a specification error. However, the Ramsey (1969) test indicates that there are omitted variables in our baseline model. That means we may leave out other information. Thus, it is highly probable that we have endogenous variables in the model which should be explained by exogenous instruments. Effectively, many existing studies show evidences of the endogeneity of foreign aid variables

<sup>13</sup>which is a measure of how far an observation deviates from the mean of that variable

<sup>14</sup>This fact indicates that at least one component in  $FDI_A$  of these countries is negative and is not offset by the positive amount of remaining components. See furthermore the definition of *FDI flows* in Appendix A

in income-growth regression (Boone (1996), Burnside and Dollar (2000), Hansen and Tarp (2001)). Hence, ODA variables could be also considered as endogenous in FDI regression because FDI flows and income growth are likely to be determined simultaneously (Kimura and Todo (2010), Asiedu et al. (2009), Selaya and Sunesen (2012)). We, therefore, rebuild our model by extending the list of regressors to include instrumental variables (IV). Our final panel sample consists of 32 countries over the period 2003- 2010. Diagnostic tests allow us to regard our specification as a dynamic model which can be estimated consistently and efficiently thanks to instrumental variables (IV) methods.

### 1.6.2 Statistical overview of the sample

Table 1.1 presents summary statistics of variables used in the dataset. We divide variables into three groups: the first group includes main variables such as aggregate FDI ( $\ln FDI$ ), aggregate ODA ( $\ln ODA$ ), FDI and ODA in physical capital ( $\ln FDI_K$ ,  $\ln ODA_K$ ), FDI and ODA in complementary inputs ( $\ln FDI_A$ ,  $\ln ODA_A$ ); the second group is composed of control variables like gross domestic savings (s), gross domestic product (gdp), population growth rate (n), balance of payment (bop), etc; the third group comprises interaction variables:  $FDI_A\_ODA_A$  to check the specific interaction effect between FDI and ODA in complementary inputs and  $ODA\_Kaufmann$  to check the effect of Kaufmann index on ODA. Generally, statistics on FDI and ODA are consistent with suggestions in the previous literature indicating that FDI plays the role as the major source of external financing for developing countries since the average value of aggregate FDI is 7.6 USD million, higher than the one of ODA at 6 USD million. Furthermore, the table also demonstrates that FDI tends to be more intensive in physical capital than in complementary inputs, meanwhile, this trend is reversed in the case of ODA. Indeed, FDI in physical capital accounts for 7.3 USD million while FDI in complementary inputs represents 5.5 USD million. By contrast, ODA in physical capital

Table 1.1 Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Log of aggregate FDI	251	7.59	1.75	3.01	11.62
Log of FDI in physical capital	254	7.29	1.88	2.18	11.56
Log of FDI in complementary inputs	238	5.45	2.22	-4.61	9.11
Log of aggregate ODA	256	6.00	1.21	2.79	8.42
Log of ODA in physical capital	256	4.04	1.26	0.55	6.83
Log of ODA in complementary inputs	256	5.82	1.22	2.51	8.23
Gross domestic savings	256	110.414	360.100	-1.755	3207.117
Gross domestic product	256	333.679	775.701	2.490	6368.261
1st Difference of savings	224	16.900	65.340	-64.171	571.611
1st Difference of GDP	224	43.776	133.418	-230.757	1039.024
Population growth rate	256	1.33	0.72	-0.47	3.36
Balance of payment	256	6.306	48.786	-50.667	452.273
Inflation rate	256	6.65	5.14	-0.85	51.46
Population	256	122	293	1	1341
Kaufmann index	256	0.41	0.20	0.00	1.00
Log of ( $FDI_A * ODA_A$ )	238	11.17	3.28	-4.61	16.76
Log of ( $ODA * Kaufmann$ )	256	4.95	1.20	-4.61	7.53

Notes: The unit of population is millions of persons; the unit of the Inflation rate and Population growth is annual percent change; the unit of FDI, ODA is 2013 USD millions; the unit of GDP, S and BOP is 2013 USD billiards.

accounts for only 4.0 USD million; at the same time, ODA in complementary inputs raises to 5.8 USD million. These suggestions conform to the distribution of  $ODA_K$ ,  $ODA_A$ ,  $FDI_K$ ,  $FDI_A$  across years and across countries as showed in tables 1.2, 1.3, 1.4 and 1.5 respectively.

Table 1.2 shows that the share of  $ODA_A$  has increased over years, from 36% in 2003 to 62% in 2010, meanwhile the share of  $ODA_K$  has not much fluctuated during 10 years with a share less than 10% in total ODA commitments. By contrast, table 1.3 indicates that  $FDI_K$  accounts for the overwhelming share relative to  $FDI_A$ . In fact, the share of  $FDI_K$  remains over 85% across years while the share of  $FDI_A$  is mainly under 15% in total inward FDI. Table 1.4 allows to further observe the share of ODA compositions across countries. There are three points to be noted. First, for most of the countries,  $ODA_A$  accounts for over 50% of total ODA commitments, in which the contribution of ODA to the social infrastructure is higher than the one to the economic infrastructure. Second, ODA financed for physical capital ( $ODA_K$ ) is relatively low, recording in most cases a share under 20%. The table also shows that countries which have the highest share of  $ODA_A$  are mostly new Asian emerging economies such as Malaysia<sup>15</sup> (98.8%), China (83%), Philippines (73%), etc. On the other hand, countries which record the highest share of  $ODA_K$  are particularly more advanced transition economies of Latin America, for instance Chile (18.78%), Peru (16.63%), Argentina (16.45%), Costa Rica (15.87%)...where financing requirements for infrastructure are not urgent relative to other developing countries. Third, the less countries are developed, the more they receive ODA. Indeed, excluding the size effect in terms of population, the highest value of ODA disbursements is recognized in small economies, like Pakistan, Bangladesh, Uganda...However, it should be noted that the amount of ODA disbursements is also considered as a measurement scale of its effectiveness: a country that benefits well ODA should have a high rate of ODA disbursements. That's why the

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<sup>15</sup>For Malaysia, the share of  $ODA_A$  and  $ODA_K$  is overpassed 100% of total ODA commitments, meaning the amount of ODA disbursed extremely exceeds the amount committed.

Table 1.2  $ODA_A$  and  $ODA_K$  by year and by sector (as % of total commitments) and total ODA receipts (in millions USD)

Year	Social infrastructure (1)	Economic infrastructure (2)	$ODA_A$ (1)+(2)	Banking (3)	Business (4)	Production sectors (5)	$ODA_K$ (3)+(4)+(5)	Total disbursements (millions USD)
2003	24.63	11.57	36.23	1.62	0.51	4.72	6.85	20647.7
2004	30.26	16.47	46.74	2.13	0.69	6.95	9.77	20239.8
2005	32.94	16.77	49.75	1.87	0.67	5.84	8.38	23638.1
2006	37.81	17.39	55.21	1.59	0.52	6.57	8.68	22758.5
2007	37.78	20.55	58.36	2.28	1.08	7.23	10.59	22074.5
2008	36.32	22.33	58.70	2.30	0.75	6.88	9.93	22747.3
2009	38.32	21.33	59.68	2.42	0.95	6.82	10.18	26271.5
2010	36.04	25.52	61.56	1.80	0.64	7.10	9.54	24629.9

Notes: Estimated amount of  $ODA_A$  and  $ODA_K$ , as percentages of total ODA commitments.  $ODA_A$  is ODA invested in complementary inputs (projects in social infrastructures, such as education, health, water supply; and economic infrastructure, such as energy, transportation, communications and multisector).  $ODA_K$  is ODA financing directly productive sectors, such as agriculture, manufacturing, trade, banking, and tourism. Total ODA disbursements expressed in constant 2013 US dollars. Calculations based on data from the Query Wizard for International Development Statistics (QWIDS) database. The main sample includes 32 developing countries, due to limitations in the availability of other variables.

Table 1.3  $FDI_A$  and  $FDI_K$  by year and by sector (as % of total inward FDI) and total FDI receipts (in millions USD)

Year	Primary sector	Secondary sector	Tertiary sector		$FDI_K$	$FDI_A$	Total FDI (millions USD)
	(1)	(Manufacturing) (2)	(Production) (3)	(Infrastructure) (4)			
2003	8.13	55.27	23.29	13.31	86.69	13.31	134088.2
2004	9.87	56.44	21.98	11.71	88.29	11.71	176823.8
2005	7.94	46.67	33.97	11.41	88.59	11.41	220275.8
2006	8.23	40.45	38.65	12.67	87.33	12.67	239036.6
2007	11.68	36.85	44.13	7.33	92.67	7.33	308750.3
2008	13.01	36.78	39.78	10.43	89.57	10.43	391045.0
2009	10.68	34.05	45.17	10.10	89.90	10.10	270353.3
2010	14.93	40.09	33.94	11.04	88.96	11.04	322973.1

Notes: Estimated amount of  $FDI_A$  and  $FDI_K$ , as percentages of total inward FDI.  $FDI_A$  is FDI invested in complementary inputs (projects in social infrastructures, such as education, health, water supply; and economic infrastructure, such as energy, transportation, communications).  $FDI_K$  is FDI financing directly productive sectors, such as agriculture, fishing, mining (primary sector); manufacturing (secondary sector), trade, banking, tourism... (productive industries in tertiary sector) Total inward FDI flows expressed in constant 2013 US dollars. Calculations based on data from the International Trade Centre (ITC)'s foreign direct investment database. The main sample includes 32 developing countries, due to limitations in the availability of FDI values broken down by industry.

high amount of ODA disbursements is also recorded in larger economies, including India, Indonesia, China, Vietnam...

The suggestions mentioned above are reaffirmed by statistics in table 1.5, indicating that the biggest recipients of FDI are not the smallest economies in the sample but the more advanced economies (China, Brazil, India, Mexico, Argentina...) and/or the more effective recipients of ODA (Vietnam, Indonesia, China... ). Among these ones, Vietnam is an interesting case to investigate as both ODA and FDI receipts by this country are relatively high compared to other countries in the sample. Additionally, the table shows that for the majority of countries, FDI is more concentrated in physical capital than in complementary inputs. This fact is consistent with statistics described in table 1.3.

In sum, the most striking features of our statistical analyses are threefold. First, FDI represents an important source of external financing for developing countries. Second, FDI flows are more intensive in physical capital than in complementary inputs. By contrast, ODA flows are more concentrated in complementary inputs than in the physical capital. This fact is proved over years and across countries. Third, countries with the highest share of ODA in complementary inputs include a large part of new Asian emerging economies which are also considered as the most attractive destinations of FDI. Among these ones, Vietnam is an interesting case to study as both ODA and FDI flows to this country are quietly high relative to other examined countries.

Table 1.4  $ODA_A$  and  $ODA_K$ , by country and by sector (as % of total commitments) and total ODA receipts (in millions USD)

Country	Code	Social infrastructure (1)	Economic infrastructure (2)	$ODA_A$ (1)+(2)	Banking (3)	Business (4)	Production sectors (5)	$ODA_K$ (3)+(4)+(5)	Total disbursements (millions USD)
Argentina	ARG	43.22	10.23	53.45	0.30	0.62	15.53	16.45	988.63
Armenia	ARM	31.43	18.32	49.76	2.11	2.60	10.02	14.72	2664.99
Bangladesh	BGD	28.06	15.54	43.60	2.09	1.21	3.43	6.74	13062.9
Bolivia	BOL	37.25	10.65	47.90	1.09	0.47	12.13	13.69	6604.7
Brazil	BRA	39.10	22.09	61.19	1.91	0.70	9.55	12.16	2504.61
Chile	CHL	40.27	32.97	73.25	8.01	2.60	8.17	18.78	1032.58
China	CHN	50.99	32.09	83.07	2.73	0.36	8.50	11.59	11898.3
Costa Rica	COK	23.24	41.66	64.90	4.92	1.75	9.20	15.87	456.76
Colombia	COL	51.75	6.11	57.86	0.53	0.27	8.64	9.44	7162.97
Dominican Rep.	DOM	42.73	11.75	54.48	0.71	0.73	10.31	11.74	949.27
Ecuador	ECU	48.63	18.60	67.23	1.93	0.75	11.86	14.54	1748.83
Honduras	HND	31.83	12.43	44.26	1.73	0.13	5.30	7.15	5006.19
Indonesia	IDN	26.09	23.84	49.94	0.54	0.44	6.21	7.20	12122.3
India	IND	36.98	19.57	56.55	2.50	0.35	7.86	10.71	14295.6
Kazakhstan	KAZ	36.70	33.61	70.31	2.95	2.54	2.52	8.01	2240.43
Cambodia	KHM	44.37	16.22	60.59	1.47	0.53	7.06	9.06	5534.04
Lao	LAO	36.49	26.08	62.57	1.32	1.80	11.54	14.66	3324.7
Mexico	MEX	41.54	18.73	60.27	0.64	0.87	3.26	4.77	1783.74
Mozambique	MOZ	39.65	14.07	53.72	1.28	0.97	5.88	8.14	14572.6
Mauritius	MUS	21.13	4.23	26.96	1.82	-0.12	3.87	5.58	547.1
Malaysia	MYS	61.47	37.36	98.83	3.04	0.27	5.17	8.49	1271.25
Nicaragua	NIC	31.35	13.62	44.97	0.63	0.52	7.93	9.08	7609.42
Pakistan	PAK	25.42	4.02	29.44	2.81	0.77	2.29	5.87	17611.6
Panama	PAN	45.29	13.64	62.02	0.12	0.65	6.06	6.83	218.48
Peru	PER	50.65	16.21	66.86	2.13	0.54	13.96	16.63	3414.27
Philippines	PHL	31.07	41.62	72.69	2.25	1.66	8.84	12.75	4405.29
El Salvador	SLV	41.64	20.48	62.12	1.22	2.54	5.01	8.77	1859.4
Thailand	THA	25.25	42.22	67.47	1.44	1.13	6.37	8.94	-2247.97
Turkey	TUR	31.40	31.40	62.80	3.30	1.09	0.82	5.21	5990.76
Uganda	UGA	42.18	11.91	54.08	1.05	0.51	6.97	8.52	13241.9
Uruguay	URY	39.49	8.41	57.08	0.71	1.12	11.54	13.36	278.88
Viet Nam	VNM	22.17	25.04	47.20	3.05	0.72	6.88	10.66	20852.8

Notes: Estimated amount of  $ODA_A$  and  $ODA_K$ , as percentages of total ODA commitments.  $ODA_A$  is ODA invested in complementary inputs (projects in social infrastructures, such as education, health, water supply; and economic infrastructure, such as energy, transportation, communications and multisector).  $ODA_K$  is ODA financing directly productive sectors, such as agriculture, manufacturing, trade, banking and tourism. Total ODA disbursements expressed in constant 2013 US dollars. Calculations based on data from the Query Wizard for International Development Statistics (QWIDS) database. The main sample includes 32 developing countries, due to limitations in the availability of other variables.



Table 1.5  $FDI_A$  and  $FDI_K$  by country and by sector (as % of total inward FDI) and total FDI receipts (in millions USD)

Country	Code	Primary sector (1)	Secondary sector (Manufacturing) (2)	(Production) (3)	Tertiary sector (Infrastructure) (4)	$FDI_K$ (1)+(2)+(3)	$FDI_A$ (4)	Total FDI (millions USD)
Argentina	ARG	29.71	40.82	18.82	10.64	89.36	10.64	58133.0
Armenia	ARM	10.27	7.32	24.15	58.26	41.74	58.26	4516.7
Bangladesh	BGD	0.97	23.91	16.77	58.34	41.66	58.34	6464.4
Bolivia	BOL	59.32	13.55	13.84	13.29	86.71	13.29	6621.6
Brazil	BRA	20.00	37.55	29.27	13.19	86.81	13.19	258539.7
Chile	CHL	28.77	7.08	23.39	40.76	59.24	40.76	28485.2
China	CHN	2.14	57.88	33.52	6.46	93.54	6.46	681827.1
Costa Rica	COK	6.00	42.07	44.58	7.35	92.65	7.35	11505.3
Colombia	COL	53.53	21.24	19.94	5.29	94.71	5.29	61173.2
Dominican Rep.	DOM	13.99	5.73	58.90	21.38	78.62	21.38	13539.5
Ecuador	ECU	29.65	21.27	32.45	16.63	83.37	16.63	4803.6
Honduras	HND	8.67	34.19	10.16	46.98	53.02	46.98	6078.3
Indonesia	IDN	28.35	34.55	24.51	12.58	87.42	12.58	51861.2
India	IND	1.64	25.00	52.06	21.30	78.70	21.30	100399.3
Kazakhstan	KAZ	27.51	8.83	58.29	5.37	94.63	5.37	117167.7
Cambodia	KHM	17.10	29.26	42.71	10.93	89.07	10.93	3782.6
Lao	LAO	19.92	25.24	10.21	44.62	55.38	44.62	1063.5
Mexico	MEX	5.32	45.75	41.63	7.31	92.69	7.31	208528.3
Mozambique	MOZ	69.49	14.47	6.82	9.23	90.77	9.23	3894.5
Mauritius	MUS	1.80	3.30	88.03	6.88	93.12	6.88	2148.6
Malaysia	MYS	13.87	45.01	42.93	-1.81	101.81	-1.81	47853.5
Nicaragua	NIC	7.53	11.46	19.58	61.44	38.56	61.44	2719.3
Pakistan	PAK	16.66	16.00	28.51	38.83	61.17	38.83	25043.1
Panama	PAN	-1.40	4.91	73.12	23.38	76.62	23.38	14337.8
Peru	PER	49.63	8.38	29.94	12.05	87.95	12.05	8135.1
Philippines	PHL	11.09	27.89	36.15	24.86	75.14	24.86	6244.6
El Salvador	SLV	1.77	20.20	53.91	24.12	75.88	24.12	4134.5
Thailand	THA	6.08	56.38	34.25	3.29	96.71	3.29	62746.9
Turkey	TUR	1.55	18.62	52.11	27.72	72.28	27.72	82135.1
Uganda	UGA	15.74	28.50	29.99	25.77	74.23	25.77	4797.3
Uruguay	URY	29.78	13.10	50.52	6.60	93.40	6.60	9044.3
Viet Nam	VNM	5.98	43.64	44.09	6.29	93.71	6.29	165621.5

Notes: Estimated amount of  $FDI_A$  and  $FDI_K$ , as percentages of total inward FDI.  $FDI_A$  is FDI invested in complementary inputs (projects in social infrastructures, such as education, health, water supply; and economic infrastructure, such as energy, transportation, communications).  $FDI_K$  is FDI financing directly productive sectors, such as agriculture, fishing, mining (primary sector); manufacturing (secondary sector); trade, banking, tourism... (productive industries in tertiary sector) Total inward FDI flows expressed in constant 2013 US dollars. Calculations based on data from the International Trade Centre (ITC)'s foreign direct investment database. The main sample includes 32 developing countries, due to limitations in the availability of FDI values broken down by industry.

## 1.7 Empirical results

In this section, we discuss empirical findings. We first consider regression results on the relationship between FDI and ODA at the cross-sectoral level data, distinguishing physical capital and complementary inputs sectors. We next propose to achieve regressions at the aggregate level to examine the overall interaction effects between them. Finally, we estimate two different specifications with and without the governance quality index to check out impacts of risks on FDI.

### 1.7.1 Effects of ODA on FDI at the disaggregated level

Table 1.6 reports results of estimating equation 1.17 for our non-balanced sample including 32 countries from 2003 to 2010 for which we have disaggregated data on FDI and ODA. Results of OLS, 2SLS, 2SLS controlling for random effects<sup>16</sup> and S-GMM estimations are reported in the first, second, third and fourth columns respectively. Overall, our estimated results strongly support the idea that FDI and ODA financed to complementary inputs ( $\ln FDI_A$ ,  $\ln ODA_A$ ) have a positive effect on FDI invested in physical capital ( $\ln FDI_K$ ) while ODA invested in physical capital ( $\ln ODA_K$ ) tends to crowd out FDI in the same stand. The negative sign of the combined effect between  $\ln ODA_A$  and  $\ln FDI_A$  implies that the substitution effect of  $\ln ODA_A$  on  $\ln FDI_K$  is more exaggerated thanks to the effect of  $\ln FDI_A$ . Meanwhile, the positive sign of  $ODA\_Kaufmann$  confirms that the quality of governance reinforces the effect of  $\ln ODA_A$ . Coefficient signs of other control variables are mostly consistent with theoretical assumptions, for instance the coefficient sign of population growth is positive, the one of domestic savings is negative...even though their net effects on  $\ln FDI_K$  are quietly small.

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<sup>16</sup>The result of Hausman (1978) test allows us to select random effects model.

We now turn our attention to diagnostic tests and linear parameter tests. Regarding OLS regression, the result of linktest suggests that our model is properly specified. The Breusch and Pagan (1979) test for heteroskedasticity also reveals that regression disturbances are constant. Nonetheless, the Ramsey (1969) test for regression specification-error indicates that there are omitted variables in our OLS model. Moreover, the high Pearson's correlation coefficient with Bonferroni-adjusted significance level of 1% suggests that there exists the first order autocorrelation in the model. This suggestion is more strengthened by the result of Wooldridge (2003) test which also implements a test for serial-correlation of the linear panel-data model. Effectively, these concerns are not surprising according to what we have discussed in the Section 1.5. Results of 2SLS and 2SLS with random effects models reported in column 2 and 3 show that the coefficient of  $\ln ODA_K$  is proximately equal to -1. Evidently, linear parameter tests indicate that we cannot reject hypotheses (i)  $\ln ODA_K = -1$  and (ii)  $\ln ODA_A > 0$ . In addition, the Sargan (1958) test of over-identification and Pagan and Hall (1983) test of heteroskedasticity do not reject the null hypothesis implying that the model is correctly specified and disturbances are homoskedastic. Unfortunately, models still contain limitations as (i) the coefficient of  $\ln ODA_K$  and  $\ln ODA_A$  are not significant in the model 2SLS+RE; (ii) we cannot reject the null hypothesis of Wu (1974)- Hausman (1978) test, signifying that the instruments in the model 2SLS are not exogenous; (iii) although Pearson's correlation coefficient is smaller compared to which in OLS model, it's still highly significant. The Arellano and Bond (1991) test for autocorrelation<sup>17</sup> also cannot reject the presence of AR(1) in the second, third and fourth differences. Thus, we pass to the next result of S-GMM model in the last column. This is as well as our preferred estimation method. Indeed, coefficients have same signs as in previous regressions but most

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<sup>17</sup>Arellano and Bond (1991) autocorrelation test is not appropriate for fixed-effects regressions for dynamic models, assuming those are done via a mean-deviation transformation. This is because the Arellano-Bond AR() test assumes that right-hand-side variables are not "post-determined," i.e., not correlated with future errors. In a dynamic setting, future values of regressors can depend on future errors. And after the mean-deviations transformation, future values of original regressors affect current values of transformed versions. That's why we have to perform Pearson's correlation coefficient, alongside Arellano and Bond (1991) test, to check and compare the autocorrelation between models.

of them are strongly significant at 1%. The p-value of Wald test for linear parameters proves that  $\ln ODA_A$  has complementary effects but unfortunately we have not enough evidence to conclude that  $\ln ODA_K$  is closed to -1, though its sign is still negative, affirming slightly its substantial effects. The high p-value of the Sargan (1958) and Hansen (1982) tests allow to valid the exogeneity of instruments using in the model. The Arellano and Bond (1991) for autocorrelation reject the presence of AR(1) indicating that the second and higher-order lags of endogenous variables are valid instruments. Coefficients of other controls have either similar signs and are mostly significant in comparison with those in previous regressions.

### 1.7.2 Effects of ODA on FDI at the aggregate level

Beside the regression running for FDI and ODA data at the disaggregated level, we also perform regressions at the aggregate level data to investigate the global effect of ODA on FDI. According to this, our regression specification should now look like:

$$\begin{aligned} \ln FDI_{it} = & \beta_0 + \beta_1 DGDP_{it} + \beta_2 DS_{it} + \beta_3 n_{it} + \beta_5 \ln ODA_{it} + \beta_8 ODA\_Kaufmann_{it} \\ & + \beta_9 BOP_{it} + \beta_{10} INFLA_{it} + \beta_{11} POP_{it} + u_{it} \end{aligned} \quad (1.18)$$

Regression results for specification 1.18 are reported in table 1.7. As indicated, the p-value of the Hansen (1982) statistic and the Arellano and Bond (1991) statistic shown in the last rows implies that instruments are orthogonal to the error term and that the error term is not auto-correlated in GMM estimators. Then, we will rely more on GMM results than on OLS, 2SLS and 2SLS+RE results, though most of coefficient signs across models are strongly significant at 1%. According to D-GMM and S-GMM results in columns 4 and 5, the effect of total ODA is negative and statistically significant. This evidence suggests that

Table 1.6 Effects of  $ODA_K$  and  $ODA_A$  on  $FDI_K$ 

Independent variables	Dependent variable: $FDI_K$			
	(1) OLS	(2) 2SLS	(3) 2SLS+ RE	(4) S-GMM
$\ln FDI_A$	1.403*** (0.199)	2.012*** (0.296)	1.842*** (0.533)	2.883*** (0.341)
$\ln ODA_K$	-0.426*** (0.154)	-1.109** (0.512)	-1.716 (2.410)	-0.407*** (0.103)
$\ln ODA_A$	0.413* (0.248)	1.501** (0.587)	1.783 (2.668)	2.960*** (0.498)
$\ln(ODA_A * FDI_A)$	-0.826*** (0.155)	-1.188*** (0.221)	-0.995*** (0.329)	-2.597*** (0.323)
$\ln(ODA * Kaufmann)$	0.906*** (0.204)	0.775** (0.322)	0.848 (0.987)	0.681*** (0.135)
s (Domestic savings)				-0.006*** (0.001)
gdp (Gross domestic product)				0.003*** (0.001)
Ds (1st Difference of savings)	-0.008 (0.009)	0.003 (0.009)	0.005 (0.010)	
Dgdp (1st Difference of GDP)	0.005 (0.003)	0.001 (0.003)	-0.001 (0.004)	
n (Growth of population)	0.062 (0.135)	0.126 (0.155)	0.059 (0.307)	0.202 (0.282)
bop (Balance of payment)	0.003 (0.005)	0.001 (0.005)	-0.001 (0.005)	0.000 (0.001)
infla (Inflation rate)	0.021 (0.018)			0.050*** (0.008)
pop_lev (Population)	0.001** (0.001)			0.002* (0.001)
Constant	3.220*** (0.568)	1.144 (0.942)	0.554 (3.526)	0.109 (1.262)
Observations	207	195	195	236
R-squared	0.617	0.538	0.498	
<b>Diagnostic tests</b>				
Linktest, p-value of hatsq	0.910			
Ramsey reset test, p-value	0.027			
Wu-Hausmann endogen., p-value		0.000		
Breusch-Pagan/Cook-Weisberg heteros. test, p-value	0.494			
Pagan-Hall heteros. test, p-value		0.152		
Sargan overid., p-value		0.088		0.507
Hansen overid., p-value			0.037	0.520
Pearson correlation coef. AR(1)	0.659	0.482	0.424	
Wooldridge autocorrelation test, p-value	0.001			
AR(1), p-value	0.000	0.000		0.007
AR(2), p-value	0.000	0.000		0.123
AR(3), p-value	0.000	0.000		0.872
AR(4), p-value	0.000	0.000		0.826
<b>Linear hypotheses tests</b>				
Ho: $\ln ODA_K = -1$	13.958	0.045	0.088	32.920
p-value	0.000	0.995	0.766	0.000
Ho: $\ln ODA_A > 0$	2.778	6.536	0.446	35.282
p-value	0.951	0.832	0.748	0.999

Notes: Standard errors are in parentheses for regression coefficients while probabilities are in parentheses for Wald tests of linear hypotheses (\*\*\* p<0.01, \*\* p<0.05, \* p<0.1).

Table 1.7 Effects of total ODA on  $FDI_K$ 

Independent variables	Dependent variable: $FDI_K$				
	(1) OLS	(2) 2SLS	(3) 2SLS+ RE	(4) D-GMM	(5) S-GMM
lnODA	-0.706*** (0.182)	-0.973*** (0.233)	-1.692** (0.755)	-1.789*** (0.289)	-1.469*** (0.232)
ln(ODA*Kaufmann)	1.170*** (0.211)	1.669*** (0.281)	2.686*** (0.784)	2.857*** (0.144)	2.265*** (0.107)
s (Domestic savings)				0.000 (0.001)	-0.005*** (0.001)
gdp (Gross domestic product)				-0.000 (0.001)	0.003*** (0.001)
Ds (1st Difference of savings)	-0.020** (0.009)	-0.013 (0.009)	-0.002 (0.005)		
Dgdp (1st Difference of GDP)	0.012*** (0.003)	0.010*** (0.003)	0.002 (0.002)		
n (Growth of population)	-0.246* (0.141)	-0.239* (0.141)	-0.465** (0.222)	-1.438*** (0.423)	-0.262 (0.191)
bop (Balance of payment)	0.003 (0.005)	0.002 (0.005)	-0.001 (0.003)	-0.002** (0.001)	0.003** (0.001)
infla (Inflation rate)	0.021 (0.019)			0.064*** (0.007)	0.056*** (0.006)
pop_lev (Population)	0.001** (0.001)			0.009*** (0.002)	-0.000 (0.001)
Constant	5.941*** (0.539)	5.293*** (0.510)	4.997*** (1.070)		4.750*** (1.018)
Observations	221	221	221	219	251
R-squared	0.433	0.405	0.295		
<b>Diagnostic tests</b>					
Linktest, p-value of hatsq	0.025				
Ramsey reset test, p-value	0.001				
Wu-Hausmann endogen., p-value		0.068			
Breusch-Pagan/Cook-Weisberg heteros. test, p-value	0.256				
Pagan-Hall heteros. test, p-value		0.653			
Sargan overid., p-value		0.110		1.000	0.998
Hansen overid., p-value			0.005	0.046	0.116
Pearson correlation coef. AR(1)	0.830	0.825	0.904		
Wooldridge autocorrelation test, p-value	0.006				
AR(1), p-value	0.000	0.000		0.061	0.059
AR(2), p-value	0.000	0.000		0.989	0.695
<b>Linear hypotheses tests</b>					
Ho: $\ln ODA_A > 0$	14.977	17.500	5.024	38.352	40.113
p-value	1.000	1.000	0.988	1.000	1.000

Notes: Standard errors are in parentheses for regression coefficients while probabilities are in parentheses for Wald tests of linear hypotheses (\*\*\*)  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ ).

the global effect of ODA on FDI is substantial. Results on other control variables are mostly significant and consistent with our expectations.

### 1.7.3 Effects of risks on FDI

Finally, to carry out independently impacts of risks on  $FDI_K$ , we reproduce the regression for model 1.17 including and excluding the governance quality index (Kaufmann index) represented for risk characteristics in each country which might affect the capital stock in each of them. The left hand side of table 1.8 presents models without Kaufmann index while the right hand side shows models with Kaufmann index. At first, most coefficients in both specifications have same signs as those in table 1.6. However, the substantial effect of  $ODA_K$  on  $FDI_K$  is not convinced absolutely once we control for Kaufmann index. In fact, in the right hand side specification, the coefficient of  $ODA_K$  is significant in OLS and 2SLS models but insignificant in 2SLS+RE and S-GMM models, even though we cannot reject the null hypothesis of their Wald test assuming that  $\ln ODA_K$  is equal to -1. By contrast, in the specification excluding the effect of Kaufmann index on the left hand side, the estimated coefficient and the Wald test both support the assumption that  $ODA_K$  crowds out perfectly  $FDI_K$ . It should be reminded that the coefficient of  $\ln ODA_K$  reported in table 1.6 has negative and significant sign but the Wald test for  $ODA_K$  in this regression rejects the null hypothesis stating that  $\ln ODA_K$  is equal to -1. Based on these arguments, we assume that there is evidence of the substantial relationship between  $\ln ODA_K$  and  $\ln FDI_K$  though this relationship is not a perfect crowding-out effect in any case.

Besides, table 1.8 shows that the quality of governance affects positively  $\ln FDI_K$  as the coefficient of Kaufmann index is positive and statistically significant in the model on the right hand side. Remember that the interaction effect term between ODA and Kaufmann index ( $ODA * Kaufmann$ ), as demonstrated in previous regressions, has also positive and

strong significant sign. At the same time, coefficient signs of other variables are basically not changed irrespective of models controlling for Kaufmann index or not. The only difference between these models concerns the significance of  $ODA_K$  and results of its Wald test, which tend to be more rigorous in models including the interaction term  $ODA \cdot Kaufmann$ . That means Kaufmann index seems to drive the significance of  $ODA_K$  and its partial effect<sup>18</sup> on ODA is more obvious than its effect on FDI. In other words, Kaufmann index is likely to be an *indirect* determinant rather than a *direct* determinant in the specification of  $FDI_K$ .

In sum, our empirical results provide evidence showing that the effect of ODA on FDI is substantial at the aggregate level data. At the cross-sectoral level, our findings indicate that on the one hand,  $FDI_A$  and  $ODA_A$  substitute  $FDI_K$ ; on the other hand,  $ODA_K$  tends to crowd out  $FDI_K$ . However, there is not enough evidence confirming that this relationship is a perfect crowding-out effect as our expectation. In addition, the substitution effect of  $ODA_A$  on  $FDI_K$  is more exaggerated by the contribution of  $FDI_A$ . Finally, the quality of governance reinforces the effect of  $ODA_A$  and likely to be an indirect determinant rather than a direct determinant of  $FDI_K$ .

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<sup>18</sup>through the interaction term  $ODA \cdot Kaufmann$



Table 1.8 Effects of risks on  $FDI_K$ 

Independent variables	Model without governance index (Kaufmann index)				Dependent variable: $FDI_K$ Model with governance index (Kaufmann index)			
	(1) OLS	(2) 2SLS	(3) 2SLS+ RE	(4) S-GMM	(5) OLS	(6) 2SLS	(7) 2SLS+ RE	(8) S-GMM
$lnFDI_A$	1.410*** (0.208)	2.037*** (0.316)	2.065*** (0.616)	2.705*** (0.348)	1.429*** (0.203)	2.020*** (0.306)	2.035*** (0.568)	2.408*** (0.627)
$lnODA_K$	-0.401** (0.161)	-1.240*** (0.541)	-2.757 (2.776)	-0.346*** (0.083)	-0.329** (0.158)	-1.154** (0.527)	-2.360 (2.677)	-0.117 (0.092)
$lnODA_A$	0.995*** (0.220)	2.160*** (0.532)	3.471 (2.588)	3.020*** (0.381)	1.199*** (0.224)	2.291*** (0.513)	3.133 (2.377)	3.197*** (0.623)
$ln(ODA_A^*FDI_A)$	-0.795*** (0.162)	-1.163*** (0.237)	-1.097*** (0.412)	-2.362*** (0.314)	-0.831*** (0.159)	-1.180*** (0.229)	-1.088*** (0.374)	-2.198*** (0.602)
s (Domestic savings)				-0.006*** (0.002)				-0.004*** (0.001)
gdp (Gross domestic product)				0.003*** (0.001)				0.002*** (0.001)
Ds (1st Difference of Savings)	-0.007 (0.009)	0.005 (0.010)	0.008 (0.013)	(0.001)	-0.007 (0.009)	0.003 (0.009)	0.007 (0.012)	
Dgdp (1st Difference of GDP)	0.005* (0.003)	0.000 (0.003)	-0.002 (0.005)		0.005 (0.003)	0.001 (0.003)	-0.002 (0.005)	
n (growth of population)	0.011 (0.141)	0.068 (0.163)	0.008 (0.396)	0.292 (0.289)	0.040 (0.137)	0.098 (0.159)	0.014 (0.357)	0.354 (0.313)
bop (balance of payment)	0.000 (0.005)	-0.002 (0.005)	-0.002 (0.007)	0.001 (0.001)	0.002 (0.005)	0.000 (0.005)	-0.002 (0.006)	-0.000 (0.001)
infla (Inflation rate)	0.014 (0.018)			0.036*** (0.009)	0.020 (0.018)			0.037*** (0.011)
$pop/ev$ (population)	0.001*** (0.001)			0.003*** (0.001)	0.001** (0.001)			0.002*** (0.001)
Kaufmann (governance quality index)								
Constant	3.917*** (0.571)	1.343 (1.013)	-0.866 (4.225)	1.330 (1.079)	1.904*** (0.582)	1.624** (0.658)	0.279 (2.005)	4.278*** (1.526)
Observations	207	195	195	236	207	195	195	236
R-squared	0.578	0.472	0.372	0.472	0.600	0.504	0.408	0.408
<b>Diagnostic tests</b>								
Linktest, p-value of hatsq	0.826				0.681			
Ramsey reset test, p-value	0.148				0.054			
Wu-Hausmann endogen., p-value						0.000		
Breusch-Pagan/Cook-Weisberg heteros. test, p-value	0.159				0.487			
Pagan-Hall heteros. test, p-value		0.133				0.203		
Sargan overid., p-value		0.052				0.096		
Hansen overid., p-value		0.474				0.472		
Pearson correlation coef. AR(1)	0.673		0.153		0.667		0.445	
Wooldridge autocorrelation test, p-value	0.000		0.346		0.001		0.408	
AR(1), p-value	0.000	0.000		0.001	0.000	0.000	0.004	
AR(2), p-value	0.000	0.185		0.185	0.000	0.000	0.204	
AR(3), p-value	0.000	0.000		0.642	0.000	0.000	0.784	
AR(4), p-value	0.000	0.000		0.551	0.000	0.000	0.497	
<b>Linear hypotheses tests</b>								
Ho: $lnODA_K = -1$	13.906	0.197	0.401	61.745	17.930	0.085	0.258	92.999
p-value	0.000	0.657	0.527	1.000	0.000	0.771	0.611	1.000
Ho: $lnODA_A > 0$	20.395	16.512	1.798	62.754	28.658	19.969	1.737	26.367
p-value	1.000	1.000	0.910	0.000	1.000	1.000	0.906	0.000

Notes: Standard errors are in parentheses for regression coefficients while probabilities are in parentheses for Wald tests of linear hypotheses (\*\*\*)  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

## **1.8 Concluding remarks**

The chapter investigates theoretically and empirically impacts of ODA on FDI applying disaggregated data across 32 developing countries during 8 years, from 2003 to 2010. Consistent with findings in previous studies, our statistic analyses confirm that FDI plays the role as the major external financing source for developing countries. Further discriminating FDI by two broad categories, we see that FDI is more intensive in physical capital than in complementary inputs while ODA is more attracted to the latter than to the matter. Our statistics also show that new Asian emerging economies are the most attractive recipients of ODA in complementary inputs and FDI. Among these ones, Vietnam is a typical case to study. Regarding empirical evidences, our regression results strongly support hypotheses that ODA in complementary inputs complements FDI in physical capital while ODA financed to physical capital sectors substitutes private foreign investments. Nonetheless, dissimilar to the assumption suggested by Selaya and Sunesen (2012), we show that there is not enough evidence confirming ODA in physical capital crowds out perfectly FDI in the same stand. Further examining the composition of FDI, we see that FDI in complementary inputs has the same behavior as its counterpart ODA. That is to say FDI in complementary sectors strengthen more the efficiency of FDI in physical capital sectors. Besides, the quality of governance (Kaufmann index) plays the role of an indirect determinant rather than a direct determinant of FDI in physical capital. At the aggregate level, our results support the view that the substitutable effect of ODA on FDI overbalance its complementary effect. This is particularly important in terms of policies concentrating on the question how to maximize the advantages of ODA in order to improving private foreign investments. Based on this, our empirical findings suggest the recommendation of investing ODA in complementary inputs which allows to increase the accumulation and efficiency of foreign investments in developing countries.



# Appendix

## A Main Variables

To construct real FDI, GDP, Savings (S) and Balance of payment (BOP), their nominal values are divided by the US GDP deflator of the corresponding year, for which the base year is 2013, compiled from the World Bank's *World Development Indicators 2016* (WDI). The unit of FDI, ODA is USD millions while the unit of GDP, S and BOP is USD milliards.

**Official Development Assistance (ODA).** Grants or loans to countries and territories on the DAC List of ODA Recipients (developing countries) and to multilateral agencies which are: (a) undertaken by the official sector; (b) with promotion of economic development and welfare as the main objective; (c) at concessional financial terms (if a loan, having a grant element of at least 25 per cent). In addition to financial flows, technical co-operation is included in aid. Grants, loans and credits for military purposes are excluded. Transfer payments to private individuals (e.g. pensions, reparations or insurance payouts) are in general not counted.

**Development Assistance Committee (DAC).** The committee of the OECD which deals with development co-operation matters.

**DAC list of ODA recipients.** The DAC list of ODA Recipients shows developing countries and territories eligible for receiving ODA. The list is designed for statistical purposes, not as guidance for aid or other preferential treatment. In particular, geographical aid allocations are national policy decisions and responsibilities. The list is revised by the DAC every 3 years.

**ODA Commitment.** A firm obligation, expressed in writing and backed by the necessary funds, undertaken by an official donor to provide specified assistance to a recipient country or a multilateral organisation. Commitments to multilateral organizations are reported as the sum of (i) any disbursements in the year reported on which have not previously been notified as commitments and (ii) expected disbursements in the following year.

**ODA Disbursement.** The release of funds to or the purchase of goods or services for a recipient; by extension, the amount thus spent. Disbursements record the actual international transfer of financial resources, or of goods or services valued at the cost to the donor. It can take several years to disburse a commitment.

**ODA invested in physical capital (ODA<sub>A</sub>).** ODA oriented to social infrastructure (such as education, health, water supply...), economic infrastructure (such as banking, business) and multi-sector (such as environment protection, urban development, research/scientific institutions...) (see *Definitions on aid for trade of OECD* for details).

**ODA invested in complementary inputs (ODA<sub>K</sub>).** ODA contributed directly to productive sectors including banking, business and production (see *Definitions on aid for trade of OECD* for details).

**FDI flows.** For associates and subsidiaries, FDI flows consist of the net sales of shares and loans (including non-cash acquisitions made against equipment, manufacturing rights, etc.) to the parent company plus the parent firm's share of the affiliate's reinvested

earnings plus total net intra-company loans (short- and long-term) provided by the parent company. For branches, FDI flows consist of the increase in reinvested earnings plus the net increase in funds received from the foreign direct investor. FDI flows with a negative sign (reverse flows) indicate that at least one of the components in the above definition is negative and not offset by positive amounts of the remaining components. For example, Germany recorded negative total inflows in 2004, due to a sizable repayment of a intra-company loan by a foreign affiliate located in Germany to its parent american company. The low value of the US\$ against the euro facilitated the repayment of the dollar-denominated debt (source: WIR 2005).

**FDI by industry (Definition of ITC).** The data in Investment Map (ITC) is adapted from Revision 3.0 of the International Standard Industrial Classification of all Economic Activities (ISIC). Most countries do not report FDI data in ISIC Rev 3.0 and hence some adaptations have been made in Investment Map. The main differences between Investment Map and ISIC Rev. 3.0 lie in the definitions of levels and the creation of additional residual categories, such as "Unspecified Secondary" or "Unspecified chemicals and chemical products" which have been introduced primarily in order to capture FDI data that cannot be classified accurately. For example, when a country only provides the total FDI data for the manufacturing sector, without any further breakdown, the data is allocated to industry "Unspecified Secondary". Level 1 in Investment Map has been created in order to analyse the FDI and Trade data for the main sectors of the economy (see Table B1.). For ease of use, economic activities are referred to as industries in Investment Map. Data on trade in services in Investment Map presently cover the three broad categories of commercial services, defined by the IMF: travel services, transportation services and other commercial services. These three categories do not match with the ISIC nomenclature and have been consequently added as new industries in Level 2.

**FDI invested in physical capital (FDI<sub>K</sub>).** Contributions of FDI to directly productive sectors including primary sectors, secondary sectors and some of tertiary sectors such as construction, wholesale and retail trade, hotels and restaurants, finance, business activities...(see Table B1. for details).

**FDI invested in complementary inputs (FDI<sub>A</sub>).** Contributions of FDI to social infrastructure including the rest of tertiary sectors including the rest of tertiary sectors such as electricity, gas and water, transport, storage and communications, education, health and social services...(see Table B1. for details).

**Gross domestic savings.** Gross domestic savings are calculated as GDP less final consumption expenditure (total consumption). Data are in current U.S. dollars (source: World Bank).

**Population growth (annual %).** Annual population growth rate. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship—except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of the country of origin (source: World Bank).

**Gross domestic product.** GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

**Inflation (annual %).** Annual percentages of average consumer prices are year-on-year changes (source: IMF).

**Current account balance (BOP).** Current account is all transactions other than those in financial and capital items. The major classifications are goods and services, income and current transfers. The focus of the BOP is on transactions (between an economy and the rest of the world) in goods, services, and income (source: IMF).

**The Worldwide Governance Indicators (Kaufmann Index).** The WGI are a research dataset summarizing the views on the quality of governance provided by a large number of enterprise, citizen and expert survey respondents in industrial and developing countries. The WGI project constructs aggregate indicators of six broad dimensions of governance: Voice and Accountability; Political Stability and Absence of Violence/Terrorism; Government Effectiveness; Regulatory Quality; Rule of Law and Control of Corruption.

## **B Additional tables**



Table B1. ITC Industry Classification

Index	ISIC Rev.3	Level of aggre.	Label
1		0	Total (merchandise & services)
2		1	Unspecified Total (merchandise & services)
<b>3</b>	<b>A-B-C</b>	<b>1</b>	<b>Primary</b>
4	A	2	Agriculture and hunting
11	B	2	Forestry and Fishing (products)
15	C	2	Mining and quarrying
27	11	2	Petroleum
31		2	Unspecified primary
<b>32</b>	<b>D</b>	<b>1</b>	<b>Secondary</b>
33	15	2	Food, beverages and tobacco
42	17	2	Textiles, clothing and leather
52	20	2	Wood and wood products
58	22	2	Publishing, printing and reproduction of recorded media
63	23	2	Coke, petroleum products and nuclear fuel
68	24	2	Chemicals and chemical products
74	25	2	Rubber and plastic products
79	26	2	Non-metallic mineral products
83	27	2	Metal and metal products
91	29	2	Machinery and equipment
96	31	2	Electrical and electronic equipment
110	33	2	Precision instruments
115	34	2	Motor vehicles and other transport equipment
125	36	2	Other manufacturing
129	37	2	Recycling
134		2	Unspecified secondary
<b>135</b>	<b>E-Q</b>	<b>1</b>	<b>Tertiary</b>
136	40	2	Electricity, gas and water
142	45	2	Construction
149	G	2	Wholesale and retail trade
170	55	2	Hotels and restaurants
174	I	2	Transport, storage and communications
178	J	2	Finance
186	K	2	Business activities
209	75	2	Public administration and defence
214	80	2	Education
220	85	2	Health and social services
225	N	2	Community, social and personal service activities
236	93	2	Other services
238		2	Unspecified tertiary
236		2	Mixed goods (trade data)
237		2	Transportation services (trade data)
238		2	Travel services, business & personal (trade data)
239		2	Other commercial services (trade data)
239		1	Unspecified total (merchandise trade)

Source: International Trade Centre (ITC)

## **Chapter 2**

# **On the Relative Performance of Domestic and Foreign-Owned Manufacturing Firms in Vietnam**

## Abstract

This chapter seeks to study the relationship between foreign ownership and corporate performance in a small emerging economy. Based on the dataset of Vietnamese manufacturing firms for the period 2000-2013, we investigate differences in performances between foreign-owned firms and domestic owned firms both in static and dynamic approaches. We find that foreign-owned firms outperform domestic owned firms in terms of productivity but under-perform the latter ones in terms of profitability. Besides, we provide evidence showing that foreign-owned firms grow faster than domestic owned firms in all margins of performance. However, they become less profitable once we control for the effects of firm size and R&D. *Convergence effect* is another characteristic of Vietnamese manufacturing firms, implying that firms with lower performance grow faster than firms with higher performance. There is also evidence that foreign-owned firms tend to survive better than domestic firms on Vietnamese market. Finally, we demonstrate that *sunk costs* and *transfer mis-pricing* are two major concerns that Vietnam should take into consideration in order to be a more attractive destination for FDI and to maximize gains that FDI bring into Vietnamese economy.

**Keywords:** Multinational corporations, Ownership, Foreign direct investment, Firm performance, Micro-panel data, Vietnam

**JEL code:** D220, D240, F230

## **2.1 Introduction**

Since the expansion of Foreign direct investment (FDI) after the mid-1990s, there has been a vast literature that has analyzed the trading behavior of various investor categories, distinguishing foreign owned firms and domestic owned firms (Aitken et al. (1997), Dahlquist and Robertsson (2001), Choe et al. (2005), Bernard et al. (2007a)). In this strand of literature, the main questions are why performance gaps between foreign-owned firms and domestic owned firms exist theoretically and whether foreign ownership explains such gaps empirically. More specifically, findings often suggested that foreign-owned firms or in other words, multinational corporations (MNCs) tend to perform relatively better than domestic owned firms (Konings (2001), Kimura and Kiyota (2007), Kosova (2010), Xu et al. (2006), Ramstetter and Ngoc (2013), etc.). In addition, MNCs are considered as the origin of spillovers that affect the efficiency of non-MNCs through both horizontal and vertical linkages (Liu et al. (2000), Li et al. (2001), Smarzynska Javorcik (2004), Haskel et al. (2007)).

The purpose of this chapter is then to investigate empirically the role of FDI by MNCs in Vietnam, as an emerging economy, and compare their economic performance with which of Vietnamese-owned firms. Vietnam provides an interesting case to study these relationships. Indeed, since Vietnam promulgated the Reforms (Doi Moi) policy in 1986 to liberalize the economy and to facilitate the development of the private sector, the country has been slowly but continuously opening for FDI to play as the main source of external financial capital and new technologies. Based on a rich and detailed firm-level dataset conducted by General Statistics Office of Vietnam (GSO), we examined differences in corporate performance between foreign and Vietnamese domestic-owned firms. Various measures of firm performance including total factor productivity (TFP), labor productivity, profits, average wages, capital intensity, etc are considered. We employ a theoretical and empirical methodology that overcome several shortcomings in the literature. Theoretically,

we rely on the dynamic model proposed by Roberts and Tybout (1997), Bernard and Jensen (1999). As for empirical analysis, we test determinants of foreign ownership as well as the survivability of foreign firms compared to domestic firms by using *probit model with random effects*. Meanwhile, the performance gaps between them will be checked by *random-effects model*.

Our results first show evidence that foreign-owned firms are younger, more capital intensive and more productive than domestic owned firms. However, unlike previous empirical studies, we find out that foreign firms in Vietnam are smaller in terms of labor, less R&D intensive and mostly less profitable than domestic firms. One finding of the study also shows that foreign-owned firms achieve faster growth than domestic firms in all performance margins. Nevertheless, if we control for the firm size in terms of affiliates number and R&D spending/Sales ratio, foreign firms become less profitable. Finally, we provide evidence showing that foreign-owned firms are likely to survive longer than domestic firms on the Vietnamese market.

Our paper brings two main contributions to the literature that examines the causal link between FDI and corporate performance. The first contribution of the present study is its developing country context. Second, it should be noted that the most sophisticated methodology allowing to compare foreign and domestic owned firms is relying on firm-level data to model a given activity, then comparing the two groups of firms after controlling for relevant effects such as industry, year, cohort...Another approach is to model the economic indicator in question directly (average labor productivity, wages, TFP) as a function of related variables (size, age, factor intensities) and a set of dummy variables identifying the ownership. Unfortunately, due to the lack of access to the firm-level dataset, papers that employed these approaches to address the comparison of foreign and domestic owned firms for the case of Vietnam remained limited. While the majority of works still based on bounded sample

size, such analyses have just been recently available since the firm-level data provided by GSO became opened to researchers. For instance, to compare the performance of foreign and local firms in Vietnam by various indicators, Ngoc and Ramstetter (2004) used three different samples: time series for all industries and the industrial sector from 1994-2002 as available, as well as for three cross-sections of industries from the 1995 economic census, the 1999 industrial survey and the 2001 enterprise census. Also exploring the database of GSO, Nguyen (2008) and Pomfret (2010) used the dataset of Vietnamese manufacturing industries for the period 2000-2005. Therefore, the contribution of our paper is to take advantage of the availability of a large-scale firm-level dataset on Vietnamese manufacturing firms covering about 430,000 firms conducted from 2000 to 2013 to investigate further the issue. To the best of our knowledge, our paper is the first one to comprehensively compare the performance of foreign and domestic-owned firms in Vietnam both in static and dynamic approaches using micro panel data.

The chapter is organized as follows. Section 2.2 reviews the relevant literature. Section 2.3 describes data and variable measurement. Section 2.4 describes the differences in performance of foreign and domestic owned firms in static approach. Section 2.5 presents theoretical, empirical models and discuss empirical findings. The final section concludes.

## **2.2 Related Literature**

There is currently a variety of literature examining the relationship between foreign ownership and corporate performance. In particular, it is asked whether performance gaps are due to the existence of multinational corporations (MNCs). Generally, the theory of MNCs deals with the hypothesis of specific advantage (Dunning (1973), Caves (2007), Markusen (1995)). According to this theory, MNCs transfer firm-specific advantages internally across borders.

MNCs will, therefore, be concentrated in knowledge-intensive sectors, which are generally characterized as growing and highly productive industries. Following Markusen (1995), there are four main characteristics of a MNC: high levels of R&D relative to sales, a large share of professional and technical workers in their workforces, products that are new and/or technically complex, and high levels of product differentiation and advertising.

Most of the previous studies are empirical works and focus especially on productivity, wage and skill gaps as performance indicators. Globerman et al. (1994) examined the relationship between foreign ownership and labor productivity using Canadian firm-level data in 1986. They found that the labor productivity and wages of foreign-owned firms are significantly higher than their local Canadian counterparts. However, these differences vanish once they control for size and capital intensity. By contrast, Doms and Jensen (1998) pointed out that foreign-owned firms perform better than domestic-owned firms even after controlling for industry, size, location and firm age. They also indicated that MNCs are the most productive, most capital intensive and pay the highest wages compared to purely foreign and domestic-owned firms. Using micro-panel data for firms located in Japan, Kimura and Kiyota (2007) examined differences in corporate performance between foreign-owned and domestic-owned firms in the 1990s. They concluded that the former ones not only reflect superior static characteristics but also reach faster growth. Moreover, foreign investors tend to invest in firms that may not be immediately profitable but would be potentially most profitable in the longer run. In addition, they found no evidence that foreign investor brings useful firm-specific assets into the Japanese market, which might have been considered as an effective catalyst for necessary structural reform.

While a large part of works has focused on advanced countries, a number of recent studies have also examined the case of emerging countries. The majority of these studies have results that are consistent with those carried out in developed countries. For

instance, considering the manufacturing industries of Asian economies, Ramstetter (1994), Ramstetter (1999), Sjöholm (1999b) suggested that foreign MNC tend to be more efficient than local firms in many cases. Indeed, they indicated that the former are relatively large, capital intensive, pay relatively high wages and have relatively high profit rates. Hallward-Driemeier et al. (2002) also confirmed that foreign-owned firms are more productive than other firms in East Asian countries. Working on a sample covered 2700 manufacturing firms of five East Asian countries: Indonesia, Korea, Malaysia, the Philippines and Thailand, their empirical analysis revealed that MNCs hold the higher productivity relative to domestic firms in all countries except Korea, even after controlling for the sector, size and export orientation. By contrast, Konings (2001) studying the effects of FDI on the performance of firms in 3 emerging market economies, Bulgaria, Romania, and Poland, showed evidence that foreign firms do not perform better than domestic ones, except in Poland, the more advanced transition economy. In addition, he found no evidence of positive spillovers, but rather negative or no spillovers of foreign investment to domestic firms. This is rationalized through a competition effect that dominates a technological spillover effect in less advanced countries such as Bulgaria and Romania. Overall, his study suggests that it takes time for ownership effects to have an effect on performance, due to lags in restructuring. Indeed, these results implied that in the early stages of transition, Bulgaria and Romania are in the increased competition from FDI spillover effects to domestic firms. That is to say, inefficient firms might be eliminated from the market due to foreign competition, which in the long run would increase the overall efficiency of the economy. In the latter stages, when domestic firms have engaged in substantial restructuring and market competition has been established, the dominating competition seems to vanish. Based on two nationwide surveys conducted by the National Bureau statistics of China over the period 1998- 2002, Xu et al. (2006) checked the performance of domestic Chinese firms in various ownership categories versus foreign-owned firms. They found that both domestic non-state-owned firms and foreign-



owned firms perform better than state-owned firms. Meanwhile, three categories of Chinese firms- privately owned, collectively owned and shareholding- had higher performance levels than foreign-owned firms.

For Vietnam, a number of studies have investigated various related issues on inward FDI. However, only a few studies examine differences in corporate performance between domestic and foreign-owned firms due to the lack of access to firm level data. The most noticeable works carried out on this issue are studies done by Ngoc and Ramstetter (2004), Ngoc and Ramstetter (2009), Ramstetter and Ngoc (2013), Nguyen (2008) and Pomfret (2010). Particularly, Ngoc and Ramstetter (2004) compared the performance of multinational corporations (MNCs) and local firms in Vietnam, distinguishing two categories of local firms: state-owned enterprises (SOE) and Non-SOE. Indeed, using firm-level data on the period 1994-2002 from General Statistic Office of Vietnam (GSO) database, they compared time-wise and industry-wise variation in indicators of corporate performance<sup>1</sup>. Consistent with the theoretical suggestions, they showed that foreign MNCs are generally larger and have higher labor productivity, capital intensity, wage levels, investment propensities and trade propensities than Non-MNCs. On the other hand, foreign MNCs tend to have relatively low capital productivity and wage shares of value added, while results regarding profitability are mixed<sup>2</sup>. The relationship between firm ownership and productivity has been investigated further by Ramstetter and Ngoc (2013). Using the same dataset but focusing on the period 2000-2006, they confirmed for the first stage, by simple calculations, that foreign MNCs, MNCs joint-ventures, and SOEs often have substantially higher labor productivity and lower

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<sup>1</sup>They divided indicators examined into five groups of economic indicators related to (i) firm or plant size (e.g. employees, sales [output] or value added per firm or plant); (ii) factor productivity and factor payments (e.g. value added or sales per worker or unit of capital, compensation per employee); (iii) factor intensity (total assets or fixed assets per employee, investment per unit of value added); (iv) functional income distribution (labor compensation per unit of value added or sales, profits per unit of value added or sales); and (v) trade propensities (exports or imports per unit of value added or sales).

<sup>2</sup>In general, these differentials tend to be small between foreign MNCs and SOE and SOE tend to be larger than foreign MNCs in terms of employment. Correspondingly, comparisons of foreign MNCs with Non-MNCs reveal more consistent differences.

capital productivity than local private firms. For the second stage, they tested differences in total factor productivity (TFP) between MNCs and SOEs on the one hand; MNCs and private firms on the other hand by estimating trans-logarithmic production functions. Their empirical results revealed an insignificant or negative difference in 2001-2003 but more often significant and positive difference in 2004-2006 if a lagged specification is used to account for potential simultaneity in this period. In addition, estimates of productivity spillovers from SOEs and MNCs to private firms also tend to be insignificant and inconsistent. Investigating the horizontal and vertical spillovers effects from foreign firms to domestic firms in Vietnam, Nguyen (2008) has run a 2SLS estimation to check the effect of technology spillover. She showed that the effect of horizontal and backward linkage of FDI on the domestic productivity is positive while the one of forward linkage is negative. In contrast, Pomfret (2010) examining wage spillovers found that wage levels in domestic private firms are higher in sectors where there is a higher presence of foreign firms and concluded domestic private firms with backward linkages to foreign firms can gain productivity spillovers and pay higher wages.

In sum, the studies mentioned above suggest that there exist important gaps in terms of performance between domestic and foreign-owned firms though these differences are not always clear. The purpose of our paper is therefore to deepen the understanding of this relationship in the case of an emerging economy. Following suggestions proposed by Kimura and Kiyota (2007), we first attempt to identify the determinants of foreign ownership and check the ability that a potentially profitable firm could become a MNC. We next examine the performance gaps between foreign and domestic-owned firms. Finally, we examine the survival of foreign-owned firms relative to Vietnamese-owned firms.

## **2.3 Data Description**

In this section, we discuss our database. We first briefly describe a number of firm-specific attributes used in empirical analysis<sup>3</sup>. These are:

- Foreign-owned dummy (foreign): foreign ownership dummy takes value one if the firm is considered as foreign-owned firm and zero otherwise.
- Survival dummy (survive): survival firm dummy takes value one if the length of firm life<sup>4</sup> is at least 2 years.
- Labor (lnL): number of workers at the end of each year
- Firm Age (lnage): the number of years that a firm survives from the first entry year to the year reported
- Wage per employee (lnwpe): total wages and other income over the number of employees
- Capital intensity (lnintcap): real capital stock over the number of employees.
- Total factor productivity (lnthp): computed following a non- parametric approach (Aw et al. (2001), Nishimura et al. (2005), Bellone et al. (2006)).
- Average labor productivity (lnalp): real value added over the number of employees
- Return on asset (lnroa): the ratio of annual net income to average total assets
- Return on equity (lnroe): the ratio of net income to stockholders' equity
- Affiliates (lnaffi): Number of domestic affiliates<sup>5</sup>

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<sup>3</sup>For the full definition of variables, see Appendix A

<sup>4</sup>For the definition of the length of firm life, see Appendix A

<sup>5</sup>The data collection for the number of domestic affiliates is discontinued.

- R&D/Sales (Inrds): Ratio of R&D spending to Sales <sup>6</sup>

Our analysis is based on the large-scale annual survey of enterprises (ASOE) data provided by the General statistics office of Vietnam (GSO) which covers all registered firms in Vietnam over the period from 2000 to 2013. The data covers firms operating in every economic sector, including agriculture, manufacturing, construction and services. Firms included in the survey are all registered firms <sup>7</sup> that were in operation on the 31st of December of the previous year. The survey information includes firm identification (tax registration number), assets and liabilities, the number of employees (by qualification), sales, wages, capital stock, industry (5-digit), obligations to the government, exports, imports, debts, date of birth...

For the purpose of our analysis, the ASOE data has the following advantages. First, the survey is comprehensive (all registered firms are covered, without size threshold, at the exception of Household business activities). Second, it includes relevant accounting information on outputs, inputs, and exports. Finally, it includes key information which allows us to identify both the ownership of the firm and the type of trade in which firms are involved.

The ASOE dataset has also some limitations. First, industry classification has changed over the period of observation. From 1993 to 2006, the Vietnam Standard Industrial Classification (VSIC) was built on the basis of International Standard Industrial Classification revision 3 (ISIC Rev.3). From 2007 up to now, VSIC 2007 was developed on the basis of ISIC Rev.4 and ASEAN Common Industrial Classification (ACIC). While VSIC 1993 is detailed at the 4 digits level, VSIC 2007 is detailed at the 5 digits level <sup>8</sup>. To achieve consistency in the industry codes for the whole sample period (2000-2013), we convert the industry

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<sup>6</sup>The data collection for R&D spending is discontinued.

<sup>7</sup>A registered firm is defined as "an independent economic unit that has acquired its legal status under Law on State-owned Enterprises, Cooperative Law, Law on Enterprises, Foreign Investment Law or by the Agreement between Vietnamese government and the government of foreign countries" (GSO, 2010, p. 4).

<sup>8</sup>See <http://unstats.un.org/unsd/cr/ctryreg/ctrydetail.asp?id=1448>

codes in the 2000-2006 data (VSIC 1993) to the new classification system (VSIC 2007) by using a concordance table at the 4 digits level provided by GSO. Then, for the purpose of international comparison, we re-aggregate in this paper industrial codes at the 2 digits level. Second, some key information is missing for some years. In particular, the information on R&D spending and number of affiliates is often missing. Also, information on working hours and capital utilization rates is not available at the firm level.

In order to build a workable dataset from the GSO database, we clean the data as follows. First, only firms with no missing information on sales, labor, capital, age and wages are kept. Second, to estimate Total Factor Productivity (TFP), we follow Ha and Kiyota (2014) to clean up the data as follows: we assign a single industry code to each firm because, if a firm switches industry, its "reference firm" must also change, as the properties of the reference firm are calculated based on industry averages. For firms that switch industry, the mode of the industry code is used<sup>9</sup>. Third, concerning the formula for ROA (return on assets) and ROE (return on owned equity), it should be excluded firms with negative asset and equity; firms with net income higher than average total asset and average total owned equity in database because abnormal returns do not have an obvious interpretation in that sense. In addition, as the equity share of foreign-owned firms is not available for the year 2001, we thus have to define by the alternative way a firm of this year as foreign-owned firm if it registers as foreign-owned firm under the Investment Law issued in 2005 of Vietnam. Finally, in our final sample, we exclude firms in the service industries but concentrated on firms operating in the manufacturing industries. We also drop all firms with less than 10 employees in order to minimize measurement errors issues but also in order to promote the comparability of our study with the earlier literature. Indeed, this size threshold makes our descriptive statistics more comparable to the existing ones in other countries as most of the firm-level databases available worldwide are confronted to size thresholds (See (ISGEP)).

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<sup>9</sup>If there is a tie in the industry code to which the firm belonged for the majority of the surveyed years, the code of the latest year is assigned.

To sum up, our sample consists of about 430,000 manufacturing firms over the period 2000-2013. After the cleanup, comparing to the original ones, the remaining size of the global sample is about 194,900 manufacturing firms accounting for 45.30% in terms of firm numbers, 78%- 83% in terms of labor, wage, sales and value added. Statistics of variables are summarized in table 2.1. In general, our global sample on the period 2000-2013 shows that the size of Vietnamese manufacturing firms in terms of labor is about 182 workers per firm while the average firm age is 8.5 years. The capital per worker is 183.18 million VND (equivalent to 8.3 thousand US\$) and the average wage is 30.5 million VND per year (about 1.4 thousand US\$). With regard to productivity and profitability, the aggregate manufacturing TFP level (in logarithm) across firms is 0.45; the average rate of ROA is 1.77% while the one of ROE is -2.54%. Foreign-owned firms at time (t) account for 16% of total manufacturing firm number. This figure increases to 18% at time (t+1). Finally, the average survival rate of manufacturing firms in Vietnam is 99%. On the other hand, the sub-sample covering the period 2007-2011 shows that the ratio of R&D to Sales is only 3%, meanwhile the average number of affiliates owned by a firm is only 0.35. In addition, values of other indicators have not changed significantly compared to those in the global sample.

Table 2.1 Firm level summary statistics

Variable	Obs	Mean	Std. Dev.
<b>Global sample (2000-2013)</b>			
Labor (number of workers)	194,905	182.80	720.42
Firm age	194,910	8.52	8.51
Capital intensity (million VND, 2010 prices)	194,899	183.18	444.19
Average wage (million VND, 2010 prices)	194,899	30.54	24.13
Labor productivity (million VND, 2010 prices)	194,900	57.39	105.01
Total factor productivity (Intfp)	194,895	0.45	1.76
Return on asset (ROA, %)	194,900	1.77	9.97
Return on equity (ROE, %)	194,900	-2.54	326.75
Foreign owned dummy	194,910	0.16	0.36
Foreign owned dummy (t+1)	135,125	0.18	0.38
Survive dummy	194,910	0.99	0.11
<b>Sub-sample (2007-2011)</b>			
Labor (number of workers)	101,926	176.40	712.09
Firm age	101,929	8.21	8.19
Capital intensity (million VND, 2010 prices)	101,923	175.31	395.82
Average wage (million VND, 2010 prices)	101,922	31.06	23.02
Labor productivity (million VND, 2010 prices)	101,923	58.26	104.42
Total factor productivity (Intfp)	101,922	0.51	1.73
Return on asset (ROA, %)	101,922	1.88	10.01
Return on equity (ROE, %)	101,922	-3.00	388.74
R&D expenditure/sales	89,391	0.03	3.37
Number of affiliates	83,388	0.35	1.60
Foreign owned dummy	101,929	0.16	0.37
Foreign owned dummy (t+1)	80,151	0.19	0.39
Survive dummy	101,929	0.99	0.09

Source: GSO database

## 2.4 Foreign versus Vietnamese -owned firms in static approaches

In this section, we present different characteristics of foreign-owned firms compared to domestic firms in static aspects. At first, table 2.2 allows to overview the sectoral distribution of firms by ownership types. Three first columns aggregate firms number for the period 2000-2013. Three next columns show the share of firms across industries while three last columns present their share within industries. The first feature can be drawn from table 2.2 is that foreign-owned firms concentrate with a high rate in a small number of industries. Specifically, they account for 18% in *Clothing and Leather*, 17% in *Chemical, rubber plastics* and 12% in *Basic metal and metal products*. Meanwhile, their shares in other industries account for only a small rate, generally under 8%. This might be due to the nature of location advantage/disadvantages, but also suggests that large entry costs still remain in many sectors (Kimura and Kiyota (2007)). On the other hand, by share within sectors, though domestic-owned firms account, for the most part, there are still some industries where the part of foreign-owned firms is not underwhelming. For example, Computer and electronic products (49%), Motor vehicles (44%), House equipment (40%), Clothing and leather (24%), etc. Undoubtedly, these ones are sectors in which Vietnam is strongly engaged into the international trade<sup>10</sup>.

In table 2.3, we present static differences in corporate characteristics for the whole sample of firms and then for sub-samples distinguished by firm categories: foreign-owned firms versus domestic owned firms, state-owned firms (SOEs) versus Non-SOEs. Overall, our global sample reveals that during 13 years, there has been an increase in the number of firms, average capital intensity, productivity, and wage but a decrease in terms of firm size (labor) and profitability. When we distinguish domestic and foreign-owned firms, we first find that

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<sup>10</sup>The question of trade related performance will be addressed in the next chapter.



Table 2.2 Firm distribution by sector and by foreign equity share: pooled sample from 2000 to 2013

ID	Sector	Number of firms			Share across sectors			Share within sectors		
		Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign	Total
1	Food, beverage & tobacco	25,689	2,593	28,282	0.16	0.08	0.15	0.91	0.09	1.00
2	Textile products	7,026	2,011	9,037	0.04	0.07	0.05	0.78	0.22	1.00
3	Clothing & leather	17,581	5,512	23,093	0.11	0.18	0.12	0.76	0.24	1.00
4	Wood & paper	22,029	1,773	23,802	0.13	0.06	0.12	0.93	0.07	1.00
5	Printing, publishing & recording	9,442	440	9,882	0.06	0.01	0.05	0.96	0.04	1.00
6	Chemical, rubber plastics	16,520	5,147	21,667	0.10	0.17	0.11	0.76	0.24	1.00
7	Pharmaceuticals	1,625	273	1,898	0.01	0.01	0.01	0.86	0.14	1.00
8	Mineral products	17,309	1,014	18,323	0.11	0.03	0.09	0.94	0.06	1.00
9	Basic metal & metal products	22,817	3,711	26,528	0.14	0.12	0.14	0.86	0.14	1.00
10	Computer & electronic products	1,282	1,225	2,507	0.01	0.04	0.01	0.51	0.49	1.00
11	Machinery & apparatus	6,612	1,866	8,478	0.04	0.06	0.04	0.78	0.22	1.00
12	Motor vehicles	1,251	982	2,233	0.01	0.03	0.01	0.56	0.44	1.00
13	Transportation equipments	2,615	974	3,589	0.02	0.03	0.02	0.73	0.27	1.00
14	House equipments	10,294	1,754	12,048	0.06	0.06	0.06	0.85	0.15	1.00
15	Manufacturing, n.e.c	2,132	1,411	3,543	0.01	0.05	0.02	0.60	0.40	1.00
	Total	164,224	30,686	194,910	1.00	1.00	1.00	0.84	0.16	1.00

Source: GSO database

domestic firms record a raise according to labor, capital intensity, average wage and labor productivity but a decline according to profitability (ROA, ROE) and number of affiliates over the period 2000-2013 while foreign-owned firms display a strong improvement according to the same margins, except the number of domestic affiliates, and on the same examined period. That means the performance growth of foreign firms is more rapid than the one of domestic firms although the last ones still account for the overwhelming number of firms. Second, foreign firms outperform domestic firms according to most of our indicators but their profitability indicators (ROA, ROE) are lower than domestic firms, even get negative values in terms of ROE<sup>11</sup>. It should be emphasized that profitability is one plant-level characteristic where foreign-owned firms generally perform worse than domestic firms (Bellak (2004)). Nevertheless, there exists some explanations for higher (acquisitions, firm-size, market share, productivity, age) and lower (greenfield, age, internal funds) profitability. In fact, Bellak (2004) argued that the higher capital intensity, which is a primary force behind an increase in labor productivity, may lead to higher profit margins. By contrast, an inferior profitability performance might be due to the motivation of foreign firms to minimize their tax burden, known as *transfer pricing* or *profit shifting*<sup>12</sup>. That's why the empirical results concerning this variable are often inconclusive in many cases. In Vietnam, the transfer (mis)pricing is a phenomenon recognized in large part of foreign-owned firms. Effectively, in 2012, General Department of Taxation (GDT) documented that 57% of the 5,500 foreign-owned firms investigated (representing 60% of total foreign operations) reported net losses between 2010 and 2011. Furthermore, a deeper report focused on transfer pricing by GDT in 2014 also shows that among 870 foreign firms conducted, 720 of them, including some of the world's biggest MNCs and famous brands and accounting for about 83%, were in violation of transfer mispricing rules according to the GDT's interpretation of Circular 66/2010/TT-

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<sup>11</sup>A negative ROE can be obtained when firms have loss (negative income)/positive equity or when they have positive income/negative equity. Since we excluded firms with negative equity in the database, then only firms with negative income remain in our sample

<sup>12</sup>The most common form of a set of profit shifting techniques is called *transfer mispricing*.

BTC (Circular 66). The Vietnam Chamber of Commerce and Industry (VCCI and USAID (2014))<sup>13</sup> analyzed that self-reported profit should be positively correlated with transfer mispricing. The principle of this activity is that firms involve in transfer mispricing to shift profits to low-tax regimes. This means that their official tax statements will yield losses, but these firms will still likely claim credit for success in their internal reporting, especially in subsidiaries of MNCs. Indeed, they find that 65% of extremely profitable firms (more than 20% margins) admit to engaging in the transfer mispricing. Similarly, 44% of highly profitable firms, 12% of moderately profitable firms and 9% of positive but low margin operation also engage in the practice. In general, loss-making firms do not employ income shifting techniques with one exception: about 30% of firms with small losses (between 0 and 5%) admit to the practice (see the table C5. in the Appendix). This suggests that *highly sophisticated firms use transfer mispricing to push themselves to just below the margin of profitability that exempts them from company income tax (CIT) payments.*

Results of GDT and VCCI and USAID (2014) are consistent with our findings. As indicated in table 2.4, we find that the rate of foreign firms who reported losses is generally higher than domestic firms across years. On average of the period 2000-2013, about 37% of foreign firms announced losses while this rate of domestic firms is only 24%. We, therefore, have evidence to suggest that the transfer mispricing is taking place among foreign firms in our sample. That allows explaining the under-performing of foreign firms compared to domestic firms in terms of ROA and ROE as demonstrated in table 2.3.

When we further examine domestic- owned firms, discriminating SOEs and Non-SOEs (table 2.3), we see that the share of SOEs has decreased over time. By contrast, the share of Non-SOEs has increased continuously. Indeed, the number of SOEs has fallen from

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<sup>13</sup>The foreign investment survey carried out by VCCI covers a highly representative selection of 1,609 firms from 49 countries whose operations are located in the 13 most economically developed provinces of Vietnam. While the PCI-FDI survey is not the only survey of foreign investment in Vietnam, it is the largest and most comprehensive

Table 2.3 Difference between foreign and domestic firms in static aspects

Variable	All firms			Domestic firms						Foreign firms					
	Obs	Mean	S.D	All domestic firms			SOEs			Non-SOEs					
				Obs	Mean	S.D	Obs	Mean	S.D	Obs	Mean	S.D			
Labor (number of workers)	5,788	220.34	634.80	5,125	196.56	509.06	1,190	504.12	820.66	3,935	103.56	310.99	663	404.12	1215.96
Capital intensity (million VND, 2010 price)	5,788	169.04	562.72	5,125	138.34	506.89	1,190	147.58	240.57	3,935	135.55	563.14	663	406.32	845.99
Average wage (million VND, 2010 price)	5,788	18.25	17.82	5,125	16.93	15.83	1,190	22.34	17.43	3,935	15.29	14.93	663	28.52	26.78
Labor productivity (million VND, 2010 price)	5,788	42.78	95.88	5,125	37.90	81.02	1,190	53.78	93.40	3,935	33.09	76.25	663	80.49	167.16
Total factor productivity (lnftp)	5,788	0.00	1.96	5,125	-0.19	1.92	1,190	1.63	1.59	3,935	-0.73	1.65	663	1.43	1.68
Returns on asset (ROA, %)	5,788	2.56	10.99	5,125	2.70	10.50	1,190	1.62	5.76	3,935	3.03	11.54	663	1.49	14.21
Returns on equity (ROE, %)	5,787	0.21	115.55	5,124	0.56	121.34	1,190	0.28	39.89	3,934	0.64	136.73	663	-2.52	52.55
Number of domestic affiliates <sup>(*)</sup>	3,942	0.67	1.98	3,398	0.68	1.96	697	1.87	3.45	2,701	0.37	1.15	544	0.65	2.06

Variable	All firms			Domestic firms						Foreign firms					
	Obs	Mean	S.D	All domestic firms			SOEs			Non-SOEs					
				Obs	Mean	S.D	Obs	Mean	S.D	Obs	Mean	S.D			
Labor (number of workers)	20,891	167.17	771.80	17,541	89.94	309.46	347	514.23	786.66	17,194	81.38	285.54	3,350	571.53	1737.62
Capital intensity (million VND, 2010 price)	20,891	236.30	502.93	17,541	190.29	399.20	347	558.35	1146.82	17,194	182.87	365.13	3,350	477.20	820.97
Average wage (million VND, 2010 price)	20,890	42.42	27.60	17,540	38.54	21.79	347	65.41	44.91	17,193	38.00	20.71	3,350	62.74	42.13
Labor productivity (million VND, 2010 price)	20,890	71.06	111.62	17,541	56.54	67.31	347	138.21	180.40	17,194	54.89	61.89	3,349	147.15	217.04
Total factor productivity (lnftp)	20,888	0.69	1.68	17,540	0.33	1.41	347	2.99	1.66	17,193	0.28	1.35	3,348	2.56	1.74
Returns on asset (ROA, %)	20,890	1.17	8.26	17,540	0.83	6.81	347	4.03	6.80	17,193	0.77	6.80	3,350	2.95	13.35
Returns on equity (ROE, %)	20,891	-0.54	65.96	17,541	-0.23	47.70	347	7.45	19.18	17,194	-0.39	48.09	3,350	-2.13	123.34
Number of domestic affiliates	16,260	0.23	1.27	13,344	0.25	1.24	312	1.30	2.65	13,032	0.22	1.18	2,916	0.15	1.38

<sup>(\*)</sup> As values of domestic affiliates number are not available for the year 2000, they are interpolated from neighboring non-missing values.

Source: GSO database

1,190 firms in 2000 to 347 firms in 2013 while similar figures of Non-SOEs are 3,935 and 17,194 respectively. However, Non-SOEs perform worse than SOEs in all aspects. This feature can be explained by the fact that on the one hand, official statistics of Vietnamese SOEs tend to be overestimated because these ones have incentives to over-report production and profits to meet state targets; on the other hand, Non-SOEs often under-report production and profits so as to avoid taxation and scrutiny of the authorities. However, it is not clear how these biases affect estimates of foreign-owned MNC shares (Ngoc and Ramstetter (2004)).

In brief, static comparisons in performance between foreign-owned firms and domestic firms show that foreign firms are larger in terms of labor, more capital intensive, pay higher wages, perform better in terms of value -added productivity and TFP but have fewer affiliates and lower profitability (ROA, ROE) than domestic- owned firms.

Table 2.4 Share of firms by profit threshold across years

Year	All of firms			Domestic firms			Foreign firms		
	Profit <0	Profit=0	Profit>0	Profit <0	Profit=0	Profit>0	Profit <0	Profit=0	Profit>0
2000	0.26	0.02	0.72	0.24	0.02	0.73	0.41	0.01	0.58
2001	0.29	0.02	0.69	0.27	0.02	0.71	0.42	0.01	0.57
2002	0.24	0.01	0.75	0.21	0.01	0.78	0.43	0.00	0.57
2003	0.25	0.02	0.73	0.22	0.02	0.76	0.45	0.01	0.54
2004	0.26	0.02	0.72	0.24	0.02	0.74	0.38	0.02	0.59
2005	0.26	0.02	0.73	0.23	0.02	0.75	0.40	0.01	0.59
2006	0.22	0.02	0.76	0.18	0.02	0.80	0.41	0.01	0.58
2007	0.22	0.01	0.77	0.19	0.01	0.80	0.36	0.00	0.63
2008	0.33	0.01	0.66	0.32	0.01	0.67	0.42	0.01	0.57
2009	0.28	0.02	0.70	0.26	0.03	0.72	0.38	0.00	0.61
2010	0.25	0.01	0.74	0.24	0.01	0.76	0.32	0.00	0.68
2011	0.27	0.00	0.73	0.25	0.00	0.74	0.34	0.00	0.66
2012	0.22	0.20	0.57	0.20	0.24	0.56	0.33	0.01	0.66
2013	0.28	0.01	0.71	0.28	0.01	0.72	0.31	0.00	0.69
Total	0.26	0.03	0.71	0.24	0.04	0.72	0.37	0.01	0.63

Source: GSO database

## 2.5 Dynamic model of foreign ownership

In this section, we present evidence of foreign ownership in Vietnam. We begin by reviewing the basic theoretical model of foreign ownership. Following Kimura and Kiyota (2007), we then show the relation between foreign ownership and different firm characteristics. Next, we demonstrate how the dynamic corporate performance is driven by foreign ownership. Furthermore, we consider impacts of this one on firm survival in the Vietnamese market. Finally, in the expanded models, we deepen our understanding of the determinants of foreign ownership by introducing further variables that serve as proxies for firm size and technology effects.

### 2.5.1 A theoretical framework

To motivate our empirical work, we follow the theoretical dynamic model developed by Roberts and Tybout (1997), Bernard and Jensen (1999). We start from the assumption that firm  $i$  located in Vietnam try to maximize its profit by adjusting its output. Suppose the profit of firm  $i$  at period  $t$  is  $\pi_{it}$ . The profit of firm  $i$  depends on firm  $i$ 's characteristics reflected in vector  $Z_{it}$  as taking the reduced form:

$$\pi_{it} = f(Z_{it}) \quad (2.1)$$

Let the foreign-ownership status at period  $t$  be  $FOS_{it}$ , which takes value one if firm  $i$  is owned by foreign investors and zero otherwise. In this setting, the profit function of a foreign firm, denoted as  $\tilde{\pi}_{it}$ , is expressed as follows:

$$\tilde{\pi}_{it} = f(Z_{it}, FOS_{it}) \quad (2.2)$$

According to Baldwin and Krugman (1989), foreign firms must incur a sunk entry cost in order to enter the Vietnamese market for the first time. We suppose foreign firms face a sunk cost denoted as  $C$  if they were not in the Vietnamese market in the period  $t-1$ . This sunk cost is assumed to be the same across firms and periods. Rewriting (2.2), we have:

$$\tilde{\pi}_{it} = f(Z_{it}, FOS_{it}) - C(1 - FOS_{it-1}) \quad (2.3)$$

In period  $t$ , the foreign investors choose the sequence of their status  $\{FOS_{ij}\}_{j=t}^{\infty}$  that maximizes the current value of payoffs given by:

$$V_{it}(Z_{it}) = \max E_t \left( \sum_{j=t}^{\infty} \delta^{j-t} \pi_{it} \mid Z_{it} \right) \quad (2.4)$$

where  $\delta$  is the one period discount rate and expectations are conditioned on the firm characteristics set,  $Z_{it}$ . The foreign ownership status of firm  $i$  can be presented as  $FOS_{it}$  value that satisfies:

$$\tilde{\pi}_{it}^* = \tilde{\pi}_{it} + \delta (E[V_{it+1}(Z_{it+1}) \mid FOS_{it} = 1] - E[V_{it+1}(Z_{it+1}) \mid FOS_{it} = 0]) \quad (2.5)$$

Then, the dynamic framework of the foreign ownership status is given by:

$$FOS_{it} = \begin{cases} 1 & \text{if } \tilde{\pi}_{it}^* > C(1 - FOS_{it-1}) \\ 0 & \text{otherwise} \end{cases} \quad (2.6)$$



## 2.5.2 Baseline model

### Foreign ownership and firms characteristics

We begin our empirical analysis by checking the determinants of foreign ownership. Taking equation (2.6), we have the empirical analysis form as follows:

$$FOS_{it} = \begin{cases} 1 & \text{if } \gamma Z_{it} - C(1 - FOS_{it-1}) + \varepsilon_{it} > 0 \\ 0 & \text{otherwise} \end{cases} \quad (2.7)$$

where  $\varepsilon_{it}$  is a disturbance term. Since our sample period is not long enough to adapt a linear probability model which requires at least two lags of the independent variables as instruments (see furthermore Bernard and Jensen (1999)), we thus follow Roberts and Tybout (1997), Bernard and Wagner (2001), Kimura and Kiyota (2007) to employ the probit model with random effects of the form:

$$FOS_{it} = \alpha + \beta FOS_{it-1} + \gamma Z_{it-1} + \eta_i + \mu_{it} \quad (2.8)$$

where  $\eta_i$  is firm-specific random effects and  $\mu_{it}$  is a disturbance term. According to Kimura and Kiyota (2007), we lag all plant characteristics and other exogenous variables by one year to avoid possible simultaneity problems. The vector  $Z$  include some measure of profitability (ROA, ROE, TFP) and other characteristics such as the capital-labor ratio the number of domestic regular workers and average wages. The problem of multicollinearity arises when we use both value-added productivity and TFP as independent variables. Therefore, we include only TFP in the regression analysis<sup>14</sup>. Considering as a determinant of profitability, firm age is also controlled for. Indeed, young affiliates of foreign owned firms entering a new market may have to be cross-subsidized by their parent for some time. These firms could

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<sup>14</sup>For the multicollinearity test, see Appendix table C3.

face high start-up and restructuring costs. Since there are sectoral differences in inward FDI, we include industry dummies to control for them. Year dummies are also used to control for exogenous macroeconomic shocks. Thus our baseline econometric model has the form as:

$$\begin{aligned}
 FOS_{it} = & \alpha + \beta FOS_{it-1} + \gamma_1 \ln L_{it-1} + \gamma_2 \ln age_{it-1} + \gamma_3 \ln wpe_{it-1} \\
 & + \gamma_4 \ln intcap_{it-1} + \gamma_5 \ln tfp_{it-1} + \gamma_6 \ln roa_{it-1} + \gamma_7 \ln roe_{it-1} + \eta_i + \mu_{it}
 \end{aligned} \tag{2.9}$$

To explain,  $\ln L_{it-1}$ - number of employees,  $\ln age_{it-1}$ - firm age,  $\ln wpe_{it-1}$ - wage per employee,  $\ln intcap_{it-1}$ - capital intensity,  $\ln tfp_{it-1}$ - total factor productivity,  $\ln roa_{it-1}$ - return on asset and  $\ln roe_{it-1}$ - return on equity.

If the sunk cost has strong effects on foreign ownership, the coefficient  $\beta$  should be positive. We also expect the coefficient of profitability variables ( $\gamma_5, \gamma_6, \gamma_7$ ) to have positive signs as we believe that they are an important factor for the decision of foreign acquisitions.

### Performance gaps between domestic and foreign-owned firms

In a second stage, we examine the effects of foreign ownership on dynamic corporate performance. According to Bellak (2004), the standard empirical model of performance gaps between foreign owned firms and domestic owned firms has the following structure:

$$A\_gap_i = f_i(FDI_i, Z_{i1}, Z_{i2}, O_{ij}) \tag{2.10}$$

where  $Z_{ij}$  is a vector of other firm- and industry-specific factors, postulated to impact on  $A\_gap$ .  $A\_gap$  may be defined in levels, in growth-rates or in differences domestic and foreign owned firms. The components of  $Z_{i1}$  include a wide range of industry-specific and firm-specific variables. Three variables, namely size of plants or firms, industry and parent country are standard control variables irrespective of the particular gap. The other variable

of interest is  $FDI_i$  and measures, whether an indigenous firm is a multinational firm or a purely domestic firm. The components of  $Z_{i2}$  are specific to the gap in question. Ownership is accounted for by the variable  $O_{ij}$ , which may be a dummy variable (0,1) or represented, e.g. by the share of employees in foreign owned firms. We then run a simple regression of changes in performance measures,  $Z_{it}$ , on initial foreign ownership status and other firm characteristics as follows:

$$\begin{aligned}\Delta Z_{it} &= \ln Z_{it} - \ln Z_{it-1} \\ &= \alpha + \beta FOS_{it-1} + \gamma Char.s_{it-1} + \varepsilon_{it}\end{aligned}\tag{2.11}$$

where  $\Delta Z_{it}$  denotes dependent variables that represent the gaps in the annual average growth rate of the performance between foreign and domestic firms in the same country such as:  $\ln L_{gr}$ ,  $\ln wpe_{gr}$ ,  $\ln intcap_{gr}$ ,  $\ln alp_{gr}$ ,  $\ln tfp_{gr}$ ... Additional variables for firms characteristics in the initial year are the same as those used in equation (2.9). Therefore, the specification (2.11) is re-written as:

$$\begin{aligned}\Delta Z_{it} &= \alpha + \beta FOS_{it-1} + \gamma_1 \ln L_{it-1} + \gamma_2 \ln age_{it-1} + \gamma_3 \ln wpe_{it-1} \\ &+ \gamma_4 \ln intcap_{it-1} + \gamma_5 \ln tfp_{it-1} + \gamma_6 \ln roa_{it-1} + \gamma_7 \ln roe_{it-1} + \varepsilon_{it}\end{aligned}\tag{2.12}$$

In previous studies, they suggest that  $\gamma_3$  has a positive sign implying that foreign owned firms pay higher wages than their counterparts as the organization of production or their use of production technology may require that they employ more skill-intensive employees than domestic owned firms (Doms and Jensen (1998)). Wage gaps thus can be an indication of a skill gap. However, Globerman et al. (1994) find that wage gaps will vanish if they control for size and capital-intensity. That means  $\gamma_3$  should be ambiguous and will need to be estimated empirically. Closely related to wage gaps are skill gaps represented by capital-intensity. Clearly, higher wages could give rise to higher levels of effort by workers, so higher capital intensity. That's why the coefficient  $\gamma_4$  should be positive. On the other

side, higher wages may also increase an incentive of domestic workers. Then,  $\gamma_1$  might have a positive sign. Generally, the theoretical analysis show that foreign owned firms perform better than domestic firms. The coefficient  $\gamma_5$  must therefore have positive sign. Finally, as discussed in the previous section, we do not have any expectation for the sign of  $\gamma_6$  and  $\gamma_7$ .

### Impacts of foreign ownership on firm survival

Respecting impacts of foreign ownership, another important question to be examined is whether foreign ownership is related to the likelihood of firm exit. It is often argued that foreign owned firms offer good performance, but may be more likely to exit from the local market, i.e., "foot-loose", compared to domestic owned firms. Then we end up with the model examining the impact of foreign ownership on firm survival. We run the regression of the form:

$$\begin{aligned}
 S_{it} &= \alpha + \beta FOS_{it-1} + \gamma Z_{it-1} + \kappa_i + \varepsilon_{it} \\
 &= \alpha + \beta FOS_{it-1} + \gamma_1 \ln L_{it-1} + \gamma_2 \ln age_{it-1} + \gamma_3 \ln wpe_{it-1} + \\
 &\quad + \gamma_4 \ln intcap_{it-1} + \gamma_5 \ln tfp_{it-1} + \gamma_6 \ln roa_{it-1} + \gamma_7 \ln roe_{it-1} + \kappa_i + \varepsilon_{it}
 \end{aligned} \tag{2.13}$$

where  $S_{it}$  equals 1 if the firm survives from year (t-1) to year t,  $FOS_{it-1}$  represents the foreign ownership dummies in year (t-1) and  $Z_{it}$  is a vector of corporate characteristics in year (t-1). If foreign firms are more likely to exit from the Vietnamese market than Vietnamese firms, the coefficient  $\beta$  must have a negative and statistically significant coefficient.

### 2.5.3 Model with size and technology effects

Because of the discontinuity of data, we have estimated contemporaneous specifications including the effects of firm size and technology under form of domestic affiliates number

and R&D with a reduced sample size running from 2007 to 2011<sup>15</sup>. Particularly, we expand models (2.9), (2.12) and (2.13) by adding two variables controlling for affiliates number and the effect of R&D intensity which is defined as the ratio of R&D spending to sales. Then, our models have the new form as:

$$\begin{aligned}
 FOS_{it} = & \alpha + \beta FOS_{it-1} + \gamma_1 \ln L_{it-1} + \gamma_2 \ln age_{it-1} + \gamma_3 \ln wpe_{it-1} + \\
 & + \gamma_4 \ln intcap_{it-1} + \gamma_5 \ln tfp_{it-1} + \gamma_6 \ln roa_{it-1} + \\
 & + \gamma_7 \ln roe_{it-1} + \gamma_8 \ln affi_{it-1} + \gamma_9 \ln rds_{it-1} + \eta_i + \mu_{it}
 \end{aligned} \tag{2.14}$$

$$\begin{aligned}
 \Delta Z_{it} = & \alpha + \beta FOS_{it-1} + \gamma_1 \ln L_{it-1} + \gamma_2 \ln age_{it-1} + \gamma_3 \ln wpe_{it-1} + \\
 & + \gamma_4 \ln intcap_{it-1} + \gamma_5 \ln tfp_{it-1} + \gamma_6 \ln roa_{it-1} + \\
 & + \gamma_7 \ln roe_{it-1} + \gamma_8 \ln affi_{it-1} + \gamma_9 \ln rds_{it-1} + \varepsilon_{it}
 \end{aligned} \tag{2.15}$$

$$\begin{aligned}
 S_{it} = & \alpha + \beta FOS_{it-1} + \gamma_1 \ln L_{it-1} + \gamma_2 \ln age_{it-1} + \gamma_3 \ln wpe_{it-1} + \\
 & + \gamma_4 \ln intcap_{it-1} + \gamma_5 \ln tfp_{it-1} + \gamma_6 \ln roa_{it-1} + \\
 & + \gamma_7 \ln roe_{it-1} + \gamma_8 \ln affi_{it-1} + \gamma_9 \ln rds_{it-1} + \kappa_i + \varepsilon_{it}
 \end{aligned} \tag{2.16}$$

where  $\ln affi_{it-1}$  denotes the number of domestic affiliates while  $\ln rds_{it-1}$  represent R&D spending-Sales ratio. In terms of firm size, many empirical studies reveal that foreign-owned firms tend to be larger than domestic owned firms. For instance, Howenstine and Zeile (1992) provide descriptive evidence in plant-scale gaps indicated that foreign-owned establishments are larger, on average, than US owned establishments. Furthermore, other studies also demonstrate that firm *size* and firm *growth* are not independent (Blonigen and Tomlin (2001), Oulton et al. (1998)). On this side, the question is whether the larger size of foreign-owned firms implying that foreign-owned firms grow faster than domestic firms. Regarding this question, there are two conflicting hypotheses, one on lower and the other on higher growth rates of foreign-owned firms<sup>16</sup>. Therefore, we suppose the coefficient of the variable  $\ln affi$

<sup>15</sup>See Appendix C2. for the availability of variables used in the dataset.

<sup>16</sup>The argument for lower growth rates of foreign-owned firms entering for the first time into a local market is uncertainties in obtaining material inputs which may arise from monitoring problems of employees or other

should be ambiguous. In terms of *R&D* effects, several authors indicate that *R&D* expenditure might be reduced in the course of a foreign acquisition as *R&D* activities could be moved from affiliates to their parent companies and vice versa (Fors (1997)). This would lead to the hypothesis of a lower *R&D* spending of foreign-owned firms. The coefficient  $\gamma_9$  is thus expected to have a negative sign.

## 2.5.4 Empirical Results

Tables 2.5, 2.7, 2.9 present regression results of equations 2.8, 2.10 and 2.11 respectively. The dataset applied for these models consist of about 194,900 firms from 2000 to 2013. Meanwhile, results of their expanded models including number of affiliates and *R&D* effects (i.e. equations 2.14, 2.15, 2.16) are reported in tables 2.6, 2.8, 2.10. The sample using in expanded models has reduced to 101,900 firms over the period 2007-2011.

Table 2.5 demonstrates that our baseline results are strongly robust irrespective of models with or without industry and year dummies. Lagged variables of *foreign ownership* are significant and positive implying that sunk cost has strong effects on foreign-ownership. Coefficients of *labor* is significantly negative in all regressions, indicating that potential foreign firms are not larger than other firms. This contrasts with evidence found in advanced countries but consistent with the reality that the size of foreign firms in Vietnam remains quite small by international standards. According to the report of VCCI and USAID (2016), the median size of foreign firms in Vietnam is about 125 employees; 73.5 % of them have fewer than 200 employees. Indeed, 46.16 % of them have fewer than 50 employees. This share of small foreign firms has increased over time. A few sizable firms are represented in their survey; about 93 firms have over 1,000 employees. A significant and negative coefficient factors and the lower capital intensity, mostly if they are small firms. On the other hand, the argument for higher growth rates of foreign-owned firms is that growth is related to learning. In this case, the growth rate of the firm will depend on the FDI type (i.e. acquisition or greenfield).

is also confirmed for the firm age, meaning potential foreign firms are younger than other firms. On the other hand, potential foreign firms tend to be more capital-intensive and more productive in terms of TFP as coefficients on *capital intensity* ( $\ln\text{intcap}$ ) and *TFP* ( $\ln\text{tftp}$ ) are significant and positive, supporting hypotheses that foreign investors which prefer to invest in domestic firms are more productive and more capital intensive. Finally, although coefficients of both indicators on profitability (ROA, ROE) are significant but ROA has a positive sign while ROE has a negative sign, meaning that potential foreign firms may have a higher return on asset but their return on equity is still lower than other firms. These results are different relative to the finding of Kimura and Kiyota (2007). He found that coefficients of ROA and ROE are not statistically significant and concluded that the entry decision by foreign investor does not depend on current profitability. In line with their conclusion but by another way, our results suggest that the investment decision of foreign firms does not depend on current profitability based on the mixed signs of ROA and ROE. It should be noted that the phenomenon of *transfer mis-pricing* may cause these results.

Table 2.6 is an expansion of table 2.5 which specifically focuses on two new independent variables represented number of affiliates ( $\ln\text{affi}$ ) and ratio R&D on Sales ( $\ln\text{rds}$ ). The main features of this table are as follows. First, since both coefficients on labor and affiliates number are significantly negative, we have more solid evidence to validate that the size of potential foreign firms is not larger than other firms. Second, as our expectation, the variable R&D/Sales has a significant and negative sign. That is to say among MNCs, R&D activities are only improved in parents enterprises then applied in affiliates abroad. Therefore, R&D spending of these affiliates should be reduced compared to local firms in host countries. In addition, coefficients on foreign dummy, labor, age, capital intensity, and TFP have the same signs as those reported in table 2.5. By contrast, the coefficient of average wage gets negative value but is not significant. Finally, ROA and ROE have negative signs but they are

Table 2.5 Regression Result of baseline model : Determinants of Foreign Ownership (1)

Independent variables (year t)	Dependent variable: Foreign ownership dummy (year t+1)			
foreign (foreign owned dummy)	5.196*** (0.0673)	5.212*** (0.0643)	4.622*** (0.0444)	4.654*** (0.0418)
lnL (number of workers)	-0.218*** (0.0540)	-0.182*** (0.0515)	-0.200*** (0.0486)	-0.187*** (0.0463)
lnage (firm age)	-0.241*** (0.0292)	-0.253*** (0.0277)	-0.240*** (0.0267)	-0.253*** (0.0260)
lnwpe (W/L, millions VND, 2010 prices)	0.0992* (0.0520)	0.0354 (0.0496)	0.107** (0.0456)	0.0618 (0.0443)
lnintcap (K/L, millions VND, 2010 prices)	0.146*** (0.0249)	0.105*** (0.0236)	0.157*** (0.0213)	0.104*** (0.0200)
lnthp (total factor productivity)	0.355*** (0.0513)	0.358*** (0.0498)	0.349*** (0.0473)	0.372*** (0.0461)
lnroa (Return on assets, %)	0.0858** (0.0360)	0.0894** (0.0347)	0.119*** (0.0329)	0.114*** (0.0311)
lnroe (Return on equity, %)	-0.0853** (0.0348)	-0.0956*** (0.0338)	-0.116*** (0.0309)	-0.123*** (0.0295)
Constant	3.165*** (0.397)	2.788*** (0.371)	3.107*** (0.342)	2.644*** (0.324)
Observations	102,459	102,459	102,459	102,459
Number of id	32,257	32,257	32,257	32,257
Industry dummy	Yes	No	Yes	No
Year dummy	Yes	Yes	No	No
Log-Likelihood	-1771	-1861	-2468	-2585

Notes: The dataset covers about 194,900 firms on the period 2000-2013. Random-effect probit model is in use. Robust standard errors are in parentheses (\*\*\* p<0.01, \*\* p<0.05, \* p<0.1). Source: GSO database.



not significant, implying that their effects on foreign ownership are ambiguous. Nevertheless, this is consistent with the empirical result of Kimura and Kiyota (2007).

Table 2.6 Regression Result of expanded model : Determinants of Foreign Ownership (2)

Independent variables (year t)	Dependent variable: Foreign ownership dummy (year t+1)			
foreign (foreign owned dummy )	5.140*** (0.0762)	5.153*** (0.0715)	4.672*** (0.0639)	4.697*** (0.0613)
lnL (number of workers)	-0.294*** (0.0703)	-0.263*** (0.0672)	-0.341*** (0.0630)	-0.329*** (0.0596)
lnage (firm age)	-0.176*** (0.0388)	-0.185*** (0.0378)	-0.173*** (0.0365)	-0.182*** (0.0364)
lnwpe (W/L, millions VND, 2010 prices)	-0.0489 (0.0643)	-0.0876 (0.0614)	-0.0236 (0.0572)	-0.0517 (0.0543)
lnintcap (K/L, millions VND, 2010 prices)	0.0971*** (0.0302)	0.0597** (0.0289)	0.0653** (0.0259)	0.0229 (0.0247)
lnfp (total factor productivity)	0.439*** (0.0689)	0.449*** (0.0673)	0.505*** (0.0629)	0.531*** (0.0613)
lnroa (return on asset, %)	0.000313 (0.0440)	-0.000801 (0.0432)	-0.00136 (0.0389)	-0.00534 (0.0383)
lnroe (return on equity, %)	-0.0242 (0.0432)	-0.0316 (0.0427)	-0.0371 (0.0380)	-0.0449 (0.0377)
lnaffi (number of domestic affiliates)	-0.0349** (0.0139)	-0.0458*** (0.0139)	-0.0452*** (0.0140)	-0.0605*** (0.0145)
lnrds (R&D/Sales, %)	-0.0382* (0.0227)	-0.0435* (0.0222)	-0.215*** (0.0252)	-0.224*** (0.0242)
Constant	2.903*** (0.502)	2.688*** (0.481)	3.274*** (0.431)	2.992*** (0.406)
Observations	62,572	62,572	62,572	62,572
Number of id	23,630	23,630	23,630	23,630
Industry dummy	Yes	No	Yes	No
Year dummy	Yes	Yes	No	No
Log-Likelihood	-1156	-1201	-1526	-1584

Notes: The dataset covers about 101,900 firms on the period 2007-2011. Random-effect probit model is in use. Robust standard errors are in parentheses (\*\*\*)  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Source: GSO database.

Table 2.7 reports regression results of the specification 2.10 by the random-effects model. The first column demonstrates the estimation result when the growth of labor is used as dependent variable. Results of the same regression but with the growth of wage per

employee, capital intensity, TFP, ROA, ROE as dependent variables are presented in columns numbered from (2) to (7) respectively. Generally, the majority of estimated coefficients are significant at 1% meaning that our regression results are confident. The table shows that foreign ownership has strong positive effects on corporate performance as coefficients of foreign-owned dummy are positive in all margins, implying that foreign-owned firms grow faster than domestic firms according to all performance measures. Particularly, gaps of annual average growth rates between these two types of firms are 2.83% in terms of labor, 1.57% in terms of average wage, 4.06% in terms of capital intensity, 2.46% in terms of average labor productivity, 5.34% in terms of TFP, 9.23% in terms of ROA and 8.39% in terms of ROE. Clearly, the highest gaps of growth rates are observed in profitability (ROA, ROE). However, in level, foreign-owned firms are still less profitable than domestic firms as indicated in section 2.4. Except for foreign-owned dummy, most of other independent variables seem to have negative effects on dependent variables. According to Kimura and Kiyota (2007), this fact is due to the "convergence effect" meaning that firms with lower performance grow faster than firms with higher performance and firms with poor performance must exit from the market. The coefficient of age gets the negative sign in the growth of average wage, labor productivity, and TFP but positive sign in the growth of labor, ROA, and ROE. That means younger firms under-perform older firms in terms of wages and productivity but outperform these latter in terms of labor and profitability. By contrast, the coefficient of capital intensity has a positive sign with respect to the growth of labor, wage, labor productivity and TFP but a negative sign to ROA and ROE accordingly, implying that more capital intensive firms could have performed better in terms of labor wage and productivity but might have less profitability than more labor-intensive firms.

Further, we investigate specification 2.10 controlling for effects of firm size in terms of affiliates number and R&D/Sales. Results are presented in table 2.8. Overall, the signs of estimated coefficients are mainly significant but slightly weaker than those reported in table

Table 2.7 Regression Result of baseline model: Effects of Foreign ownership on Dynamic corporate performance (1)

Independent variables (year t)	Dependent variables: growth of variables from year (t) to year (t+1)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
foreign (foreign owned dummy )	lnL_gr 0.283*** (0.0104)	lnwpe_gr 0.157*** (0.00685)	lnintcap_gr 0.406*** (0.0143)	lnalp_gr 0.246*** (0.0106)	lnfnp_gr 0.534*** (0.0145)	lnroa_gr 0.923*** (0.0229)	lnroe_gr 0.839*** (0.0236)
lnL (number of workers)	-0.396*** (0.00845)	-0.101*** (0.00624)	-0.144*** (0.0121)	0.697*** (0.00924)	0.316*** (0.0122)	-0.154*** (0.0183)	-0.142*** (0.0190)
lnage (firm age)	0.0443*** (0.00341)	-0.0791*** (0.00249)	0.0147*** (0.00506)	-0.0793*** (0.00328)	-0.0556*** (0.00477)	0.0968*** (0.00852)	0.0880*** (0.00900)
lnwpe (W/L, millions VND, 2010 prices)	0.0360*** (0.00751)	-0.868*** (0.00618)	-0.161*** (0.0103)	-0.0763*** (0.00804)	-0.0366*** (0.0108)	-0.118*** (0.0161)	-0.0997*** (0.0167)
lnintcap (K/L, millions VND, 2010 prices)	0.0634*** (0.00278)	0.00676*** (0.00202)	-0.684*** (0.00517)	0.0478*** (0.00274)	0.112*** (0.00385)	-0.0573*** (0.00672)	-0.0715*** (0.00722)
lnfnp (total factor productivity)	0.0288*** (0.00782)	0.171*** (0.00597)	0.240*** (0.0115)	-0.611*** (0.00897)	-0.597*** (0.0118)	0.258*** (0.0174)	0.303*** (0.0181)
lnroa (return on asset, %)	-0.00947** (0.00456)	-0.0333*** (0.00312)	-0.0577*** (0.00649)	-0.0345*** (0.00421)	-0.0482*** (0.00614)	-0.619*** (0.0103)	-0.0241** (0.0112)
lnroe (return on equity, %)	0.0151*** (0.00430)	0.0288*** (0.00289)	0.0392*** (0.00610)	0.0331*** (0.00396)	0.0521*** (0.00577)	-0.249*** (0.00981)	-0.886*** (0.0109)
Constant	0.564*** (0.0572)	2.846*** (0.0436)	3.317*** (0.0837)	-2.810*** (0.0610)	-2.368*** (0.0829)	0.974*** (0.126)	1.196*** (0.131)
Observations	144,008	144,002	144,005	144,001	144,002	115,348	115,243
Number of id	49,257	49,256	49,255	49,257	49,255	40,117	40,072
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-sq overall	0.130	0.301	0.231	0.206	0.167	0.321	0.343

Notes: The dataset covers about 194,900 firms on the period 2000-2013. Random-effect model is in use. Estimated coefficients indicate the gaps of growth rate between foreign and domestic firms. Robust standard errors are in parentheses (\*\*\* p<0.01, \*\* p<0.05, \* p<0.1). Source: GSO database.

2.7. Foreign ownership does not positively affect all indicators of corporate performance. Indeed, coefficients of foreign-owned dummy show that foreign firms still grow faster but have lower profitability than domestic firms. Both additional variables *domestic affiliates number* and *R&D/Sales* have the same signs with regard to labor productivity, TFP, ROA, and ROE, indicating larger and more R&D intensive firms are more productive but less profitable than smaller and less R&D intensive firms. Finally, similar to results reported in the previous table, coefficient signs of other independent variables are mostly negative, confirming the convergence effect.

As for effects of ownership on firm survival, tables 2.9 and 2.10 present regression results of equations 2.13 and 2.16 respectively, using the probit model with random effects. Contrary to our expectation, results of both tables demonstrate that foreign-owned dummy variable is significantly positive whether or not we include industry and year dummies and control for various characteristics of firms. There is no evidence that firms with foreign ownership are more likely to exit from the Vietnamese market than local firms. Estimation results also show that surviving firms tend to be older, larger and more capital intensive than exiting firms. Therefore, on the one hand, firms with good performance seem to survive better than firms with bad performance, on the other hand, foreign ownership is not decisive in exiting from the market; by contrast, foreign-owned firms are likely to survive longer than domestic firms.

To sum up, our dynamic models demonstrate that potential foreign-owned firms in Vietnam are neither larger, nor more R&D intensive but younger, more productive and more capital intensive than other firms. Similar to the finding of Kimura and Kiyota (2007), the current profitability is not a determinant of foreign ownership. However, there might be biases concerning self-reported profits due to the phenomenon called *transfer mis-pricing* within MNCs in Vietnam. Our study of the performance gaps between foreign and domestic owned

Table 2.8 Regression Result of expanded model: Effects of Foreign ownership on Dynamic corporate performance (2)

Independent variables (year t)	Dependent variables: growth of variables from year (t) to year (t+1)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	L_gr	w_gr	intcap_gr	alp_gr	tfp_gr	roa_gr	roe_gr	affi_gr	rds_gr
foreign (foreign owned dummy)	0.158*** (0.00996)	0.146*** (0.00809)	0.289*** (0.0152)	0.240*** (0.0123)	0.409*** (0.0152)	0.837*** (0.0276)	0.754*** (0.0289)	-0.106*** (0.0122)	-0.0696*** (0.0164)
lnL (number of workers)	-0.266*** (0.00984)	-0.117*** (0.00844)	-0.126*** (0.0154)	0.630*** (0.0124)	0.379*** (0.0155)	-0.115*** (0.0249)	-0.0646** (0.0262)	-0.00690 (0.0143)	0.0512*** (0.0132)
lnage (firm age)	0.00492 (0.00386)	-0.0632*** (0.00320)	0.0269*** (0.00651)	-0.0769*** (0.00428)	-0.0853*** (0.00569)	0.0374*** (0.0113)	0.0162 (0.0120)	0.0240*** (0.00492)	0.0315*** (0.00635)
lnwpe (W/L, millions VND, 2010 prices)	0.0606*** (0.00882)	-0.839*** (0.00858)	-0.159*** (0.0126)	-0.101*** (0.0109)	-0.0349** (0.0137)	-0.0900*** (0.0216)	-0.0566** (0.0225)	0.00433 (0.0130)	0.0133 (0.0123)
lnintcap (K/L, millions VND, 2010 prices)	0.0620*** (0.00334)	0.000647 (0.00267)	-0.588*** (0.00746)	0.0489*** (0.00364)	0.113*** (0.00488)	-0.0229** (0.00933)	-0.0310*** (0.0101)	0.00637 (0.00434)	0.0103** (0.00405)
lnfp (total factor productivity)	0.0365*** (0.00912)	0.196*** (0.00815)	0.222*** (0.0146)	-0.533*** (0.0121)	-0.511*** (0.0151)	0.243*** (0.0239)	0.254*** (0.0251)	0.0327** (0.0138)	0.00289 (0.0128)
lnroa (return on asset, %)	0.00887* (0.00500)	-0.0183*** (0.00379)	-0.0428*** (0.00779)	-0.00538 (0.00510)	0.00411 (0.00703)	-0.532*** (0.0140)	-0.0218 (0.0155)	-0.0233*** (0.00702)	-0.00965 (0.00705)
lnroe (return on equity, %)	-0.00451 (0.00495)	0.0194*** (0.00366)	0.0326*** (0.00742)	0.0136*** (0.00491)	0.00939 (0.00688)	-0.249*** (0.0138)	-0.799*** (0.0157)	0.0173** (0.00689)	0.00224 (0.00698)
lnaffi (number of domestic affiliates)	0.00586*** (0.00165)	0.0117*** (0.00128)	0.00585** (0.00258)	0.0107*** (0.00174)	0.0160*** (0.00242)	-0.0167*** (0.00426)	-0.0104** (0.00462)	-0.178*** (0.00338)	0.0165*** (0.00269)
lnrds (R&D/Sales, %)	0.00260 (0.00281)	0.00808*** (0.00232)	0.00850*** (0.00333)	0.00641** (0.00278)	0.00868** (0.00391)	-0.0294*** (0.00665)	-0.0238*** (0.00688)	0.00259 (0.00505)	-0.945*** (0.0111)
Constant	0.515*** (0.0667)	3.324*** (0.0606)	3.491*** (0.108)	-1.831*** (0.0835)	-1.397*** (0.106)	0.221 (0.174)	0.419** (0.183)	-0.721*** (0.101)	-4.528*** (0.100)
Observations	71,296	71,295	71,296	71,294	71,294	59,052	59,013	68,643	48,290
Number of id	27,777	27,776	27,776	27,777	27,777	23,506	23,496	26,654	21,924
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-sq overall	0.0772	0.267	0.197	0.149	0.0747	0.228	0.236	0.110	0.507

Notes: The dataset covers about 101,900 firms on the period 2007-2011. Random-effect model is in use. Estimated coefficients indicate the gaps of growth rate between foreign and domestic firms. Robust standard errors are in parentheses (\*\*\* p<0.01, \*\* p<0.05, \* p<0.1). Source: GSO database.

Table 2.9 Regression Result of baseline model: Effects of Foreign ownership on Firm survival (1)

Independent variables (year t)	Dep. var: firm survival dum. (year t+1)	
foreign (foreign owned dummy )	0.291*** (0.0626)	0.394*** (0.0779)
lnL (number of workers)	0.0659 (0.0422)	0.0643 (0.0563)
lnage (firm age)	0.365*** (0.0231)	0.456*** (0.0276)
lnwpe (W/L, millions VND, 2010 prices)	-0.177*** (0.0461)	0.0295 (0.0512)
lnintcap (K/L, millions VND, 2010 prices)	-0.0312** (0.0138)	-0.0266 (0.0169)
lnthp (total factor productivity)	0.0526 (0.0416)	0.0490 (0.0540)
lnroa (return on asset, %)	0.121*** (0.0224)	0.0156 (0.0292)
lnroe (return on equity, %)	-0.0808*** (0.0206)	0.00736 (0.0271)
Constant	-2.747*** (0.364)	-1.262*** (0.392)
Observations	144,011	144,011
Number of id	49,257	49,257
Industry dummy	No	Yes
Year dummy	No	Yes
Log-Likelihood	-8014	-7234

Notes: The dataset covers about 194,900 firms on the period 2000-2013. Random-effect probit model is in use. Robust standard errors are in parentheses (\*\*\*) p<0.01, \*\* p<0.05, \* p<0.1). Source: GSO database.

Table 2.10 Regression Result of expanded model: Effects of Foreign ownership on Firm survival (2)

Independent variables (year t)	Dep. var.: firm survival dum. (year t+1)	
foreign (foreign owned dummy )	0.365*** (0.135)	0.371*** (0.139)
lnL (number of workers)	0.160** (0.0778)	0.172** (0.0821)
lnage (firm age)	0.0632** (0.0299)	0.0567* (0.0311)
lnwpe (W/L, millions VND, 2010 prices)	0.0286 (0.0716)	0.0341 (0.0754)
lnintcap (K/L, millions VND, 2010 prices)	0.0750*** (0.0209)	0.0525** (0.0224)
lnthp (total factor productivity)	-0.0404 (0.0732)	-0.0383 (0.0777)
lnroa (return on asset, %)	0.0385 (0.0390)	0.0276 (0.0418)
lnroe (return on equity, %)	0.00473 (0.0380)	0.0134 (0.0398)
lnaffi (number of domestic affiliates)	-0.00969 (0.0122)	-0.0189 (0.0126)
lnrds (R&D/Sales, %)	-0.0130 (0.0266)	0.0116 (0.0281)
Constant	-1.490*** (0.536)	-1.560*** (0.560)
Observations	71,299	71,299
Number of id	27,778	27,778
Industry dummy	No	Yes
Year dummy	No	Yes
Log-Likelihood	-1526	-1491

Notes: The dataset covers about 101,900 firms on the period 2007-2011. Random-effect probit model is in use. Robust standard errors are in parentheses (\*\*\* p<0.01, \*\* p<0.05, \* p<0.1). Source: GSO database.

firms, consistent with previous studies, also confirm that foreign firms generally grow faster than domestic firms according to all margins of performance. However, after controlling for the effects of firms size in terms of affiliates number and R&D/Sales ratio, though foreign firms grow faster in mostly margins, they are less profitable than domestic firms. Furthermore, there exists a *convergence effect* implying that firms with lower performance grow faster than firms with higher performance. Additionally, younger firms perform better than older firms in wages, productivity but underperform the last ones in terms of labor and profitability. By contrast, larger, more capital intensive and more R&D intensive firms display higher productivity growth but have lower profitability than smaller, more labor intensive and less R&D intensive firms. Finally, by examining the impact of foreign ownership on firm survival, we found significant evidence suggesting that foreign-owned firms can survive better on local market than domestic firms.

## 2.6 Conclusion

The chapter is an attempt to recent new empirical studies of the relationship between foreign ownership and corporate performance. Based on the dataset of Vietnamese manufacturing firms for the period 2000-2013, this study tries to further investigate the role of FDI in an emerging economy by comparing economic performances of foreign-owned firms with those of Vietnamese firms both in static and dynamic approaches. Important findings of this paper are threefold. First, static comparison results, as well as regression results, confirm that foreign-owned firms outperform domestic owned firms in terms of productivity but under-perform these latter ones in terms of profitability. Nonetheless, there exists among MNCs in Vietnam the phenomenon *transfer mis-pricing* which might underestimate the real profitability of foreign-owned firms. That could cause the bias in our estimation results. In any respect, consistent with the finding of Kimura and Kiyota (2007), we suggest that the



current profitability does not matter in the decision of foreign investors. Besides, foreign-owned firms have other characteristics such as younger, smaller, more productive, more capital intensive and less R&D intensive than Vietnamese-owned firms. Second, foreign-owned firms grow faster than domestic firms in all margins of performance. However, once controlling for the effects of firm size and R&D spending/Sales, they become less profitable than domestic firms. In this aspect, we also find out the *convergence effect* among Vietnamese manufacturing firms, meaning that firms with lower performance grow faster than firms with higher performance. Third, by checking the survival of foreign firms relative to Vietnamese firms, unlike the suggestion of Kimura and Kiyota (2007), we see that foreign-owned firms seem to survive better on the Vietnamese market than domestic firms.

Finally, our results show that spillovers have occurred between foreign firms and Vietnamese-owned firms as the latter ones could benefit through learning, adaptation, worker mobility from the former which have superior performance in capital, technology, and productivity. On the other hand, performance comparisons can also be linked to the literature of foreign entry effect on the market structure. In this strand of literature, the foreign entry may have a direct impact on the conduct and performance of local firms and improve the competition between two kinds of firms to avoid elimination from the market. Our evidence proved that firms with good performance tend to survive better than firms with bad performance and Vietnamese firms are more likely to exit, which might be due to the selection process. With respect to policy intervention, another concern that Vietnamese policy makers have to face is the *transfer mis-pricing* within MNCs which may seriously reduce public gains of the total economy. Bellak (2004) argued that foreign-owned firms are often less profitable despite their superior performance in economic terms, points to such rent-shifting activity rather than to inferior profitability. This is absolutely in line with our finding in the paper. In addition, the sunk cost is also an issue which needs to pay attention on,

suggesting that Vietnamese policymakers must improve transparency which has important direct and indirect effects on foreign investors' decisions to expand their operations.



# Appendix

## A Main Variables

All nominal output and inputs variables are available at the firm level. Industry level data are used for price indexes and depreciation rates.

**Foreign-owned firm.** Foreign- owned firm is a firm that satisfies two conditions: register as foreign-owned firm under the Investment Law issued in 2005 of Vietnam and account for at least 10% equity share by foreigners.

**Domestic-owned firm.** The domestically-owned firm is a firm registered as a foreign-owned firm with less than 10% equity share by foreigners or a firm belongs to other firm types except foreign-ownership type under the Investment Law issued in 2005 of Vietnam.

**Nominal net sales.** Following the law no 14/2008/QH12 on enterprise income tax and the Circular no 200/2014/TT-BTC guiding accounting policies, (nominal) gross sales are defined as the total revenue including revenue of selling goods, products and provisions of services (such as providing transportation or travel services, leasing of fixed assets by operating lease way, construction contract...) plus the remuneration from processing (not including values of materials and processed goods) when the firm is a processing enterprise.

Net sales are gross sales less the cost of sales returns, allowances, and discounts: tax on special consumption, tax on exported goods, VAT calculated by the direct method.

**Real net sales.** Real net sales are defined as nominal net sales deflated by the Producer's price index (PPI) at the 2 digits industrial level with the base year 2010.

**Real value added.** Real value added is defined as Nominal value added deflated by the PPI. Nominal value added is not directly observable on GSO data as we lack the information on the material consumptions. Thus, nominal value added is measured using the addition method, in which the value added is the sum of total labor cost, annual depreciation of fixed assets, operating profit before tax and other taxes on production.

**Total labor cost.** The total labor cost includes wages and other income that employees receive in terms of allowance and bonuses, and the employer's contribution to social insurance, health insurance, and trade union fees.

**Annual depreciation of fixed assets.** Annual depreciation of fixed assets is computed as the difference between the accumulated depreciation of fixed assets at the end and the beginning of each year. Following the circular no 45/2013/TT-BTC, accumulated depreciation of fixed assets is the total depreciation deducted in the production and business costs through the business cycles of fixed assets as of the reporting date. Accumulated depreciation of fixed assets is compiled directly from GSO's data.

**Other taxes on production** Other taxes on production consist of taxes that enterprise must pay to the State to undertake production activities. They mainly consist of annual taxes on the land ownership/land-use rights, buildings, and other assets used in the production. As these taxes are not observable directly on GSO's data, they are computed as the difference between total taxes and taxes on products including VAT (VAT on domestic

selling goods/imported goods), tax on imported/exported goods, tax on income, tax on special consumption.

**Average labor productivity.** Real value added over the number of employees

**Real capital stock** Real capital stock is measured as the real fixed tangible assets at the end of each year. Real tangible fixed assets are measured as nominal tangible fixed assets divided by the manufacturing PPI. Following Ha and Kiyota (2014), because of the unavailability of the investment goods price deflator, we have to replace it by the manufacturing PPI. That's also why it's not possible to employ the perpetual investment method to compute the TFP.

**Capital intensity.** Real capital stock over the number of employees

**Input cost share.** Input cost share is the sum of total labor cost and capital cost. For the capital cost, we use nominal fixed tangible assets.

**Labor input.** The total number of employees at the end of each year.

**Wage per employee.** Total labor cost over the number of employees.

**ROA (returns on assets).** Return on assets is the ratio of annual net income to average total assets of a business during a financial year.

**ROE (returns on equity).** Return on equity or return on capital is the ratio of net income of a business during a year to its stockholders' equity during that year.

**Net income.** Net income is the after-tax income.

**Average total asset.** Average total assets are calculated by dividing the sum of total assets at the beginning and at the end of the financial year by 2.

**Average shareholders' equity.** Average shareholders' equity is calculated as the mean of shareholders' equity at the beginning and at the end of the year.

**Survival firm dummy.** Survival firm dummy equals 1 if the firm survives from year (t-1) to year (t).

**Length of firm life.** The number of years that a firm survives from the first entry year to the exit year (length= exit\_year - entry\_year+1)

**Firm age.** The number of years that a firm survives from the first entry year to the reported year (age= reported\_year- entry\_year+1).

**SOE (State-owned enterprises)** include following types: (1) Enterprises with 100% of state capital operating under control of central or local governmental agencies; (2) limited companies under management of central or local government; (3) joint stock companies with domestic capital, of which the government shares more than 50% charter capital.

**Non-SOE (Non-state owned enterprises)** are enterprises set up by domestic capital. The capital may be owned by private with 1 or individual group or the government when the capital of the government is equal or less than 50% of registered capital. There are following types of non-state enterprises: (1) private enterprises; (2) cooperative name companies; (3) private limited companies; (4) joint stock companies without capital of State; (5) joint stock companies with 50% and less than of charter capital shared by the government.

## B Computation of Total Factor Productivity

The methodology given in Caves et al. (1982) and Good et al. (1997) consists of computing the TFP index for firm  $i$  at time  $t$  as follows:

$$\ln TFP_{it} = \ln Y_{it} - \overline{\ln Y}_t + \sum_{\tau=2}^t (\overline{\ln Y}_\tau - \overline{\ln Y}_{\tau-1}) - \left[ \begin{aligned} & \sum_{n=1}^N \frac{1}{2} (S_{nit} + \overline{S}_{nt}) (\ln X_{nit} - \overline{\ln X}_{nt}) \\ & + \sum_{\tau=2}^t \sum_{n=1}^N \frac{1}{2} (\overline{S}_{n\tau} + \overline{S}_{n\tau-1}) (\overline{\ln X}_{n\tau} - \overline{\ln X}_{n\tau-1}) \end{aligned} \right] \quad (\text{A-1})$$

where  $Y_{it}$  denotes real added value produced by firm<sup>17</sup>.  $i$  at time  $t$  using the set of  $n$  inputs  $X_{nit}$ , where input  $X$  is alternatively capital stocks ( $K$ ), labour in terms of hours worked ( $L$ ) and intermediate inputs ( $M$ ).  $S_{nit}$  is the cost share of input  $X_{nit}$  in the total cost (Appendix A provides a full description of the variables). Subscripts  $\tau$  and  $n$  are indices for time and inputs, respectively. Symbols with upper bars correspond to measures for the reference point (the hypothetical firm), computed as the means of the corresponding firm level variables, over all firms in year  $t$ . Note that Eq.(A-1) implies that references points  $\overline{\ln Y}$  and  $\overline{\ln X}$  are the geometric means of the firm's output quantities and input quantities respectively, whereas the cost shares of inputs for representative firms  $\overline{S}$  are computed as the arithmetic mean of the cost share of all firms in the dataset. This approach to measuring TFP growth has the advantage of not requiring direct estimation of the underlying technology and therefore of not requiring econometric specification and estimation of production functions. This multilateral productivity index measures the proportional difference in the TFP of any firm  $i$  against the reference firm. It guarantees the transitivity of any comparison between two

<sup>17</sup>The main advantage in using the real value added is its aggregation property. Real value added is directly comparable across industries, while real gross output is not comparable because, conceptually, it is measured using different units in each industry Ha and Kiyota (2014).



firm-year observations in expressing each firms input and output as deviations from a single reference point. This method is therefore particularly well-suited for the analyze of panel data. Finally, note that first-differencing the logarithmic values of our TFP index measures can be interpreted as gaps in percentage points if they remain small.

## C Additional tables

Table C1. Number of firms across years

Year	Domestic firms	Foreign firms	Total
2000	5,125	663	5,788
2001	5,431	898	6,329
2002	6,643	980	7,623
2003	7,507	1,286	8,792
2004	9,118	1,639	10,757
2005	10,381	1,839	12,220
2006	10,315	2,223	12,537
2007	12,045	2,404	14,448
2008	15,386	2,597	17,983
2009	14,803	2,886	17,689
2010	15,981	3,107	19,088
2011	16,761	3,421	20,182
2012	17,187	3,393	20,580
2013	17,541	3,350	20,891
Total	164,224	30,686	194,910

Source: GSO database

Table C2. The availability of variables used in the dataset

Variable name	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Sales	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Number of labors	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Capital labor ratio (K/L)	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Average wage (wages/L)	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Labor productivity (VAL/L)	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Value added	a	a	a	a	a	a	a	a	a	a	a	a	a	a
TFP (total factor productivity)	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Returns on asset (ROA)	a	a	a	a	a	a	a	a	a	a	a	a	a	a
Returns on equity (ROE)	a	a	a	a	a	a	a	a	a	a	a	a	a	a
R&D expenditure	a	a	a	n/a	a	n/a	n/a	a	a	a	a	a	n/a	n/a
N. of domestic affiliates	n/a	a	n/a	n/a	n/a	n/a	a	a	a	a	a	a	a	a
Firm age	a	a	a	n/a	n/a	a	n/a	a	a	a	a	n/a	a	a
Equity share of foreign owned firms	a	n/a	a	a	a	a	a	a	a	a	a	a	a	a

Missing values of domestic affiliates number and age are interpolated from neighboring non-missing values. The equity share of foreign-owned firms is not available for the year 2001, we thus have to define foreign-owned firm of this year by the alternative way according to its business registration under the Investment Law issued in 2002 of Vietnam. Source: GSO database

Table C3. Multicollinearity test

Model including both Intfp and lnalp			Model including only Intfp		
Variable	VIF	1/VIF	Variable	VIF	1/VIF
Intfp	316875.63	0.00	Intfp	31.31	0.03
lnL	185337.28	0.00	lnL	19.72	0.05
lnalp	82209.15	0.00	sector15_5	12.12	0.08
y_9	1013.34	0.00	sector15_1	10.83	0.09
y_12	886.95	0.00	sector15_15	10.15	0.10
y_13	839.23	0.00	lnroa	9.85	0.10
y_11	536.13	0.00	lnroe	9.77	0.10
y_10	515.45	0.00	sector15_2	9.66	0.10
y_8	126.24	0.01	sector15_9	8.83	0.11
y_6	70.74	0.01	sector15_3	8.71	0.11
y_5	41.20	0.02	sector15_6	5.79	0.17
y_7	27.46	0.04	sector15_12	5.08	0.20
y_2	17.44	0.06	lnwpe	4.86	0.21
sector15_5	11.98	0.08	sector15_13	4.82	0.21
sector15_1	10.68	0.09	sector15_7	4.67	0.21
sector15_15	10.03	0.10	y_12	4.66	0.21
lnroa	9.86	0.10	y_13	4.48	0.22
y_3	9.84	0.10	y_11	4.44	0.23
lnroe	9.77	0.10	y_10	4.21	0.24
sector15_2	9.53	0.10	y_9	3.97	0.25
sector15_9	8.75	0.11	y_8	3.80	0.26
sector15_3	8.41	0.12	y_7	3.50	0.29
y_4	6.58	0.15	y_6	3.24	0.31
sector15_6	5.67	0.18	y_5	3.05	0.33
sector15_12	5.13	0.19	y_4	2.67	0.38
lnwpe	4.86	0.21	sector15_14	2.59	0.39
sector15_13	4.70	0.21	lnintcap	2.59	0.39
sector15_7	4.61	0.22	y_3	2.48	0.40
lnintcap	2.59	0.39	sector15_8	2.45	0.41
sector15_14	2.55	0.39	y_2	2.13	0.47
sector15_8	2.39	0.42	sector15_10	2.04	0.49
sector15_10	2.00	0.50	sector15_4	2.02	0.49
sector15_11	1.98	0.51	foreign	1.50	0.67
foreign	1.50	0.67	lnage	1.21	0.83
lnage	1.21	0.83			
<b>Mean VIF</b>	<b>16818.02</b>		<b>Mean VIF</b>	<b>6.27</b>	

Source: GSO database

Table C4. Correlation matrix

	foreign	foreign (t+1)	lnL	Inage	Inwpe	Inintcap	Intfp	Inroa	Inroe	Inaffi	Inrds
<b>Correlation Matrix 1</b> (obs=62,572)											
foreign (foreign owned dummy )	1.000										
Foreign (t+1)	0.977	1.000									
lnL (number of workers)	0.322	0.319	1.000								
Inage (firm age)	0.002	-0.001	0.306	1.000							
Inwpe (W/L, millions VND, 2010 prices)	0.272	0.279	0.170	0.113	1.000						
Inintcap (K/L, millions VND, 2010 prices)	0.305	0.309	0.108	0.197	0.377	1.000					
Intfp (total factor productivity)	0.456	0.459	0.861	0.294	0.566	0.404	1.000				
Inroa (return on asset, %)	0.270	0.268	0.193	0.068	0.194	0.002	0.328	1.000			
Inroe (return on equity, %)	0.257	0.255	0.275	0.106	0.253	0.037	0.412	0.925	1.000		
Inaffi (number of domestic affiliates)	-0.064	-0.069	0.232	0.202	0.085	0.094	0.222	0.010	0.056	1.000	
Inrds (R&D/Sales, %)	-0.010	-0.031	0.105	0.075	-0.037	0.032	0.065	0.007	0.013	0.099	1.000
<b>Correlation Matrix 2</b> (obs=71,299)											
foreign (foreign owned dummy )	1.000										
survive (survive dummy)	0.011	1.000									
lnL (number of workers)	0.325	0.020	1.000								
Inage (firm age)	0.007	0.091	0.305	1.000							
Inwpe (W/L, millions VND, 2010 prices)	0.264	0.037	0.173	0.101	1.000						
Inintcap (K/L, millions VND, 2010 prices)	0.295	0.027	0.114	0.198	0.370	1.000					
Intfp (total factor productivity)	0.452	0.033	0.863	0.290	0.568	0.401	1.000				
Inroa (return on asset, %)	0.260	-0.002	0.189	0.064	0.176	-0.014	0.314	1.000			
Inroe (return on equity, %)	0.251	0.005	0.274	0.102	0.239	0.024	0.404	0.926	1.000		
Inaffi (number of domestic affiliates)	-0.056	0.001	0.243	0.198	0.088	0.098	0.232	0.009	0.057	1.000	
Inrds (R&D/Sales, %)	-0.008	-0.014	0.110	0.071	-0.039	0.033	0.068	0.009	0.015	0.099	1.000

Source: GSO database

Table C5. Estimated share of firms engaged in transfer mis-pricing (by profit)

Profit threshold	N	Share of firms	Estimated transfer mis-pricing (%)				
			SE	T-value	P-value	Low estimate	High estimate
Over 20% profit margin	39	65.1%***	10.1%	6.4	0.0	48.9%	81.3%
10% -20% profit margin	105	44.5%***	6.9%	6.4	0.0	33.5%	55.5%
5%- 10% profit margin	262	12.3%	9.7%	1.3	0.23	-3.2%	27.8%
0%- 5% profit margin	455	9.1%*	4.8%	1.9	0.08	1.4%	16.8%
Broke even	163	19.7%	15.2%	1.3	0.22	-4.6%	44.0%
5%-0% loss	176	30.9%	17.4%	1.8	0.1	3.1%	58.7%
10%-5% revenue loss	76	-2.1%*	24.6%	-0.1	0.93	-41.5%	37.3%
Over 10% revenue loss	68	-0.3%	20.4%	0.0	0.99	-32.9%	32.3%

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1 Source: VCCI and USAID (2014)

Table C6. Survival and exit patterns of the manufacturing firms, by year

Number of firms year	All of firms			Domestic owned firms			Foreign owned firms		
	Exit	Survival	Total	Exit	Survival	Total	Exit	Survival	Total
2000	196	5,592	5,788	181	4,944	5,125	15	648	663
2001	97	6,232	6,329	88	5,343	5,431	9	889	898
2002	119	7,504	7,623	108	6,535	6,643	11	969	980
2003	41	8,752	8,793	40	7,467	7,507	1	1,285	1,286
2004	80	10,677	10,757	77	9,041	9,118	3	1,636	1,639
2005	147	12,073	12,220	143	10,238	10,381	4	1,835	1,839
2006	29	12,509	12,538	28	10,287	10,315	1	2,222	2,223
2007	181	14,268	14,449	172	11,873	12,045	9	2,395	2,404
2008	200	17,783	17,983	193	15,193	15,386	7	2,590	2,597
2009	144	17,545	17,689	138	14,665	14,803	6	2,880	2,886
2010	260	18,828	19,088	255	15,726	15,981	5	3,102	3,107
2011	53	20,129	20,182	51	16,710	16,761	2	3,419	3,421
2012	162	20,418	20,580	157	17,030	17,187	5	3,388	3,393
2013	795	20,096	20,891	659	16,882	17,541	136	3,214	3,350
Total	2,504	192,406	194,910	2,290	161,934	164,224	214	30,472	30,686

Conditional exit rate and survival rate year	All of firms			Domestic owned firms			Foreign owned firms		
	Exit	Survival	Total	Exit	Survival	Total	Exit	Survival	Total
2000	0.03	0.97	1.00	0.04	0.96	1.00	0.02	0.98	1.00
2001	0.02	0.98	1.00	0.02	0.98	1.00	0.01	0.99	1.00
2002	0.02	0.98	1.00	0.02	0.98	1.00	0.01	0.99	1.00
2003	0.00	1.00	1.00	0.01	0.99	1.00	0.00	1.00	1.00
2004	0.01	0.99	1.00	0.01	0.99	1.00	0.00	1.00	1.00
2005	0.01	0.99	1.00	0.01	0.99	1.00	0.00	1.00	1.00
2006	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00
2007	0.01	0.99	1.00	0.01	0.99	1.00	0.00	1.00	1.00
2008	0.01	0.99	1.00	0.01	0.99	1.00	0.00	1.00	1.00
2009	0.01	0.99	1.00	0.01	0.99	1.00	0.00	1.00	1.00
2010	0.01	0.99	1.00	0.02	0.98	1.00	0.00	1.00	1.00
2011	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00
2012	0.01	0.99	1.00	0.01	0.99	1.00	0.00	1.00	1.00
2013	0.04	0.96	1.00	0.04	0.96	1.00	0.04	0.96	1.00
Total	0.01	0.99	1.00	0.01	0.99	1.00	0.01	0.99	1.00

A conditional survival rate is for the ratio of surviving firms to that in the previous year.  
Source: GSO database

## **Chapter 3**

# **Productivity and Wage Premia: Evidence From Vietnamese Ordinary and Processing Exporters †**

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†This chapter is based on a joint research with F. Bellone and M. DAVIS.



## **Abstract**

In this chapter, we reveal new stylized facts on Vietnamese exporters by emphasizing firm heterogeneity in terms of trade activity (processing versus ordinary trade) and ownership (domestic versus foreign-owned). We first show that the distribution of firm export intensities exhibits a U-shaped pattern with, on average, more than half of Vietnamese exporters exporting more than 50% of their output. This pattern contrasts with the one found in industrialized countries but is conform to the one found for other emerging economies strongly involved in processing trade. We then show that export premia, evaluated both in terms of productivity and wage indexes, are positive only for Vietnamese exporters involved in the ordinary trade. By contrast, export processing Vietnamese firms have *lower* productivity and pay *lower* wages than their non-exporting counterparts and this is even more true for foreign-owned companies compared to domestic ones. These findings question the role that export processing firms, especially foreign-owned ones, could play in driving productivity and wage dynamics of Vietnam.

**Keywords:** Processing trade, wage, firm productivity, firm-level data, Vietnam

**JEL code:** F10, F14, L60

## **3.1 Introduction**

In this chapter, we provide first evidence on the performance of Vietnamese exporters compared to non-exporters based on a large scale firm level dataset which allows differentiating firms according to their main trade activity and to their ownership. Some previous contributions on the relative performance of Vietnamese exporters exist (see Hiep and Ohta (2007, 2009)) which concern only a small sample of firms surveyed by the World Bank in 2005. By contrast, our data come from the Annual Survey on Enterprises (ASOE) provided by the General Statistics Office (GSO) of Vietnam which cover all registered firms in Vietnam over the period from 2000 to 2013. Those data have been only recently opened to researchers. They have been used to investigate various topics in firm dynamics (see for instance Ngoc and Ramstetter (2004), Ngoc and Ramstetter (2009), Ramstetter and Ngoc (2013), Pomfret (2010), Ha and Kiyota (2014)), but to the best of our knowledge, our paper is the first one to investigate, in a systematic way, the relationship between firm exports and productivity in Vietnam.

Following the previous literature, we start by describing export participation rates and average firm export intensities at a detailed level of the industry classification. We investigate how those variables change across foreign-owned firms and domestic-owned ones. We also show how those variables change across firms located in Non-Tariff Zones (NTZ) and firms located outside NTZ. As we will explain in further details later, the location of a firm in or out NTZ is one of the information provided by GSO data that allow us to identify the degree of a firm involvement into processing trade. In a second step, we estimate export premia, both in terms of productivity indexes and in terms of wage per employee, and we investigate to what extent these export premia are sensitive to a firm ownership and main trade activity.

Our results shed new light on how specific is the relationship between firm export, productivity and wages in emerging economies as compared to developed countries. We first show that the distribution of firm export intensities exhibits a U-shaped pattern with, on average, more than half of Vietnamese exporters exporting more than 50% of their output. This pattern strongly contrasts with the ones that have been found for industrialized countries but is conform to the ones that have been found for another big emerging economy, namely China (Lu (2010)). It portrays the specific role that internationalization plays in emerging economies where the activity of some local firms is entirely dedicated to taking part in global value chains.

For those firms mainly dedicated to serving international markets, we found, unsurprisingly, that they are likely to be foreign-owned and to be highly involved in processing trade. When we turn to investigate the relationship between those characteristics and export premia, we find that foreign-owned exporters *under*-perform their non -exporting counterparts, namely foreign affiliates of the same industry, cohort and year, which operate on the (Vietnamese) domestic market only. At first sight, this result can be seen as counter-intuitive. However, we will see that it echoes a previous one found by Lu et al. (2010) for affiliates of multinational firms operating in China. We also show that foreign-owned exporters likewise *underperform* domestic exporters.

Correspondingly, we show that the main driver of the relative "bad" performance of foreign-owned exporters is their relative higher involvement into processing trade. Basically, only Vietnamese exporters strongly involved in processing trade under-perform their non-exporting counterparts in terms of productivity and wage. By contrast, the expected positive export premia are found for exporters mainly involved in the ordinary trade in Vietnam. Second, we show that foreign ownership is positively related to firm performance once controlled for ordinary and processing trade.

The rest of the chapter is organized as follows. In section 3.2, we review the literature on firm export and productivity with a special focus on emerging economies which take a large part in global value chains. In section 3.3, we describe the dataset providing some basic summary statistics on our firm sample. In section 3.4 we provide evidence on firm export participation rates and firm export intensity distributions across various industries and different categories of firms differentiated by their ownership and their main trade activity. In section 3.5, we investigate further the relative performance of exporters, both in terms of productivity and wages, by discriminating them according to their ownership and main trade activity. Section 3.6 tests the robustness. Concluding remarks are presented in section ??.

## **3.2 Literature Background**

Analysis of firm heterogeneity has benefited from the field of international trade by exploiting new models in which firms' export behavior is largely driven by differences in productivity. Within this literature, the model by Melitz (2003) specifically emphasizes fixed entry costs into export markets as the primary reason for which firm productivity is related to its participation in the export activity. Firms must be productive enough as to be able to cover the additional entry cost into the export markets. On the other hand, less productive firms find it rational to concentrate on the domestic market exclusively.

On the empirical side, there is now a large series of papers that document the superior productive efficiency of exporting firms compared to non-exporting ones within a large variety of countries (see Bernard and Jensen (1995, 1999), Clerides et al. (1998), Bernard and Wagner (1997) and Aw et al. (2000) for the pioneering papers in this field). Those papers further examine the hypothesis that firms self-select into export markets by comparing the productivity of future exporters and non-exporters at a particular point in

time, prior to entry into export markets. The observed ex-ante productive superiority of future exporters has been usually interpreted as indirect evidence of the presence of sunk entry costs into export markets.

However, the evidence that exporters outperform non-exporters has been recently challenged for China (Lu (2010), Lu et al. (2010), Dai et al. (2016)). As China is the world's largest trader, this puzzling exception has called for explanations. The first explanation by Lu (2010) emphasizes endowment based comparative advantages. In a model a la Melitz (2003) extended to take into account the Hesksher-Ohlin theory, Dan Lu showed that when firms in a labor-abundant country like China export to developed countries, comparative advantage makes it easier to enter the foreign market for labor-intensive goods. Therefore, the foreign markets are less competitive than the domestic market for Chinese labor-intensive firms: less productive firms sell only to the foreign market while the survivors in the more competitive domestic market are more productive. The opposite is true for capital intensive sectors: the foreign market is more competitive because the rental cost is lower and foreign firms have lower costs, so less productive Chinese firms sell domestically and more productive firms export. As a result, for Chinese firms, relatively more productive firms export in capital intensive sectors while relatively less productive firms export in labor-intensive sectors.

An alternative explanation is provided by Dai et al. (2016) which emphasizes global value chains rather than comparative advantage and domestic market size as the main determinant of the absence of an export premium for Chinese manufacturing firms. Combining information at the firm-level with information at the transaction level originated from Chinese Customs, they are able to discriminate firms according to their degree of involvement in processing trade. They show that Chinese exporters mainly involved in processing trade significantly under-perform Chinese firms mainly involved in the ordinary trade. Moreover, they show that in all sectors, i.e. not only in the labor intensive ones but

also in the capital intensive ones, processing trade firms push down the average performance of exporters relatively to non-exporters. All in all, they show that only processing trade firms have counter Melitz properties and conclude that processing trade (rather than relative market sizes coupled with comparative advantages) is the main reason behind the abnormal negative export premia found for China.

Our paper takes advantage of the availability of a large-scale firm-level dataset on Vietnamese exporters to investigate further the issue. Vietnam is an interesting case of study here because as China, it takes a large part in global value chains, but differently, for China, its domestic market size is small comparatively to the World market size. However, there are very few firm-level studies related to export behaviors of firms in Vietnam. Moreover, the few existing ones have been carried out on a limited dataset originated from the "Productivity and the Investment Climate Enterprise Survey of Vietnam (Vietnam PICS) conducted by the World Bank in 2005. This database surveys 1150 firms in the manufacturing sector of the country, following random sampling methodology. It had been used to investigate various related issues on firm exports<sup>1</sup>. In this strand of the literature, the papers the most closely related to our own study are series of papers by Hiep and Ohta (2007), Hiep and Ohta (2009) and Nguyen Hiep (2009). The two first papers emphasize the role of entry costs and heterogeneous characteristics of firms in the decision to export and the causality between exporting and firm characteristics. The latter one investigates the impacts of a firm's characteristics, perceived competition intensity and constraints in the domestic market on the intensity of its exports. In these series of papers, by using a panel of firm-level data of manufacturing firms for the years from 2002 to 2004 and via random effects dynamic probit model, Vietnamese Exporters are shown to have on average larger size, more experience but

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<sup>1</sup>Nguyen et al. (2008) use data from the World Bank survey in 2004 to estimate an export equation of small and medium-sized enterprises (SMEs) to examine the effect of innovation on export propensity. They find that innovation causes exports for the sample they use. However, productivity variables are not treated in this study. Anwar and Nguyen (2011) use the same dataset to estimate an export equation using firm-level data in Vietnam to unrevealed spillover effects of foreign direct investment on exporting behaviors of domestic firms. Effects of productivity or other characteristics of firms are not controlled for

also higher total factor productivity. However, when testing for the self-selection hypothesis, they show that productivity is not a relevant predictor of the probability of a firm to start exporting. Only a firm size, experience and foreign ownership are significantly and positively related to the probability of starting to export. On the other hand, when they look at learning by exporting effects, they show that exporting firms enjoy higher TFP and revenue growth compared to their non-exporting counterparts.

By contrast with these previous studies, our analysis is based on the large-scale ASOE data provided by GSO which covers all registered firms in Vietnam over the period from 2000 to 2013. Up to now, those data have been explored by a few researchers only. For instance, Ha and Kiyota (2014) use GSO data to estimate the relationship between trade liberalization and aggregate productivity growth in Vietnamese manufacturing, decomposing aggregate productivity growth into the effects of firms growth, resource reallocation, and entry and exit. On the other hand, Dinh (2014) focuses on the determinants of the survival of foreign firms in Vietnam. However, to the best of our knowledge, none of these previous studies address the productivity-export nexus the way we do. Thus, our paper fills a gap by providing for Vietnam the first investigation of the relationship between firm exports, productivity, and wages based on the large scale ASOE firm-level dataset.

### **3.3 Data**

In this chapter, we rely on the same database used in chapter 2. Moreover, in order to achieve this current study, we identify the ownership of the firm, as well as the type of trade firms, are involved in based on information compiled from the ASOE data.

Considering first ownership, the ASOE survey provides information on the participation of foreign capital in the corporate structure of the firm allowing to distinguish domestic

firms from foreign-owned firms. In this paper, we follow the widespread definition according to which a foreign-owned firm is “*an enterprise resident in one economy and in which an investor resident in another economy owns, either directly or indirectly 10% or more of its voting power if it is incorporated or the equivalent for an unincorporated enterprise*” (OECD, 2008).

Considering next types of trade, while ASOE data do not properly include information on the nature of firm transactions, they provide us with two alternative means to *indirectly* infer the likelihood of a firm to be primarily involved in trade processing or to be primarily involved in the ordinary trade. First, the ASOE survey allows us to discriminate a firm as a *export-processing firm* when this firm declares an export’s value higher than its turnover value. Indeed, thanks to specific accounting rules in Vietnam, export-processing firms must declare as turnover only the value of the processing and not the value of processed goods<sup>2</sup>. On the other hand, they have to declare as exports the value of processed goods. Under these accounting rules, a firm which declares export values larger than turnover values is likely to be a firm primarily involved in processing trade (although it could also partly operate ordinary trade). Conversely, a firm which declares export values lower than its turnover is likely to be primarily involved in ordinary trade (although it could also partly operate processing trade)<sup>3</sup>.

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<sup>2</sup>According to article 8 of The law no 14/2008/QH12 on Enterprise income tax, “*turnover is total sales, processing remuneration, service provision charges, subsidies and surcharges enjoyed by enterprises*”. Also according to the circular no 200/2014/TT-BTC guiding accounting policies for enterprises, “*in case units only process materials, goods, then turnovers are the actual amount of money earned, not including values of materials, goods processed*”. Based on the above notions, we can explain why a number of exporting firms record export values higher than turnover values. That is because those firms are processing for foreign partners: they record only the remuneration paid for processing goods in their turnover, not including values of materials or processed goods.

<sup>3</sup>Usually in the literature, firms for which export values are above turnover values are simply discarded from the sample to avoid export intensity values larger than 1 (see for instance Feenstra and Hanson (2001), Dai et al. (2016)). However, for most countries, those firms account for a very low percentage of the firms surveyed by statistical offices as general accounting law requires the values of processed goods to be reported both as sales and as exports by the processing firms. By contrast, considering the specific Vietnamese accounting rules, discarding all the observations with export values higher than turnover values would lead us to discard about 50% of total exports in our sample



GSO's data also provide us with an alternative mean to (indirectly) differentiate export processing firms from ordinary exporters by relying on information about the firm location. Specifically, some Vietnamese firms operate in special activity zones including industrial parks, export processing zones and economic zones<sup>4</sup>. From this information, we can identify what is called Non-Tariffs Zones (NTZ) firms. Those firms are identified as firms located and operating in an export processing zone or firms located and operating in any other special zones (i.e. industrial parks or economic zones) and exporting all their output. Indeed, according to Vietnamese Law "*Firms which are located in special zones and export all their products have to be considered as export processing enterprises*" (see Decree No. 29/2008/ND-CP in Appendix C), and "*Non Tariff Zones must include both export processing zones and export processing enterprises* (see Circular no 06/2012/BTC in Appendix C). According to these rules, we identify NTZ firms in our paper as firms with a location code corresponding to an export processing zone or with a location code corresponding to any other special zones (industrial parks or economic zones) and exporting more than 90% of their turnover<sup>5</sup>.

Basically, the cleanup of the data along with the definition of variables are reached as described in chapter 2<sup>6</sup>. In addition, with the goal of this current study, we add to our list of variables the notion of the export status, according to this, a firm is considered to be an exporter in any particular year if it reports export values greater than zero. This implies that individual firms can switch from being a non-exporter to being an exporter in the next year and vice versa.

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<sup>4</sup>see the definition of different special activity zones in Appendix C

<sup>5</sup>We set the threshold export value at 90% of the firm turnover instead of (exactly) 100% because, in ASEO data, export values are reported in dollars while turnover values are reported in Vietnamese dong. Considering exchange rates variations, slightly lower values of exports compared to turnover can be results of mis-measurement

<sup>6</sup>For details of the cleanup and definitions of variables used in the dataset, see Appendix A in Chapter 2

All in all, our sample consists of about 51,291 manufacturing firms on average over the period 2010-2013 with 9,690 manufacturing firms in 2000 as the reference year. After the cleanup, comparing to the original ones, the remaining size of the sample (of the year 2000 and over the period 2010-2013 respectively) is 47.85-65.87% in terms of firm numbers; 87.35-91.50% in terms of turnover; 81-72.53% in terms of export values and 87.11-86.70% in terms of labor.<sup>7</sup> In table 3.1, we offer an industry breakdown overview of our firm sample for the initial year 2000 and for the most recent period 2010 to 2013. The first column shows in value and in percentage the distribution of firms across 15 manufacturing sectors. Three next columns aggregate firm statistics to bring up the relative weight in terms of employment, turnover and exports of each sector in the panel. Overall, there is a strong evolution from 2000 to the period 2010-2013 in all margins (i.e. number of firms, total employment, total turnover and total exports). From 2000 to the period 2010-2013, the number of firms has been multiplied by 4. On the other hand, values of turnover, labor and exports have been on average multiplied by 1.30, 1.44 and 1.97 respectively. Some sectors show a much higher rate of growth than others especially in terms of exports. For instance, exports have been multiplied by more than 8 in *Motor vehicles* industry, by about 4 in *Mineral products* industry and by about 3 in *House equipment* industry. Each of those sectors takes larger total turnover and export share for the period 2010-2013 compared to the year 2000. Meanwhile, over the period 2010-2013, there are 7 out of 15 sectors which have witnessed a decline in terms of turnover and export share, such as *Food, beverage & tobacco* industry, *Textile products* industry, and *Clothing & leather* industry. It is noticeable that these three sectors are sectors in which Vietnam is nonetheless still strongly engaged into GVCs.

In Table 3.2 we present the breakdown of our sample in terms of export status, i.e. exporters versus non-exporters. Following the previous discussion, we further discriminate

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<sup>7</sup>The survey of GSO covers 42086 firms in 2000 and 342,454 firms on average over 2010-2013. As part of our research, we focus only on firms in manufacturing sectors. Therefore, we crop the database by keeping only firms in 15 manufacturing sectors, i.e. about 23-15% of total firms examined in survey but these firms account 30.36-28.87% in terms of turnover; 45.67-54.24% in terms of export values and 42.96-41.73% in terms of labor.

Table 3.1 Our firm sample: breakdown by industry

ID	Industry	2000						2010-2013 <sup>1</sup>									
		Nb. Of firms		Labor		Output		Exports		Nb. Of firms		Labor		Output		Exports	
		Value	(% of total)	(% of total)	(% of total)	(% of total)	(% of total)	Value	(% of total)	(% of total)	(% of total)	Value	(% of total)	(% of total)	(% of total)	Value	(% of total)
1	food, beverage & tobacco	1477	23.41	16.57	30.57	25.01	2912	12.04	10.20	20.51	7.74						
2	textile products	259	4.10	6.28	5.06	7.00	1142	4.72	3.68	4.05	4.35						
3	clothing & leather	752	11.92	34.32	11.99	33.12	3229	13.35	38.87	9.01	24.87						
4	wood & paper	807	12.79	7.82	5.18	8.43	2819	11.65	4.43	3.75	18.84						
5	printing, publishing & recording	253	4.01	2.04	2.43	0.17	1298	5.37	1.38	1.17	0.36						
6	chemical, rubber plastics	576	9.13	6.84	10.47	4.89	2787	11.52	6.97	11.03	12.17						
7	pharmaceuticals	92	1.46	1.37	2.16	0.39	190	0.78	0.63	0.82	0.06						
8	mineral products	853	13.52	9.33	8.27	1.14	2154	8.90	5.53	4.80	4.52						
9	basic metal & metal products	415	6.58	5.89	6.95	2.77	3690	15.25	5.94	11.41	4.03						
10	computer & electronic products	87	1.38	1.32	3.25	2.86	333	1.38	5.19	6.41	5.63						
11	machinery & apparatus	85	1.35	1.21	4.76	9.08	1145	4.73	4.86	14.53	8.02						
12	motor vehicles	123	1.95	1.18	2.48	0.34	221	0.91	1.81	3.40	2.79						
13	transportation equipment	174	2.76	2.07	4.84	1.34	320	1.32	2.03	5.04	0.94						
14	house equipment	285	4.52	2.66	0.96	1.42	1458	6.03	5.98	2.79	4.05						
15	manufacturing, n.e.c	72	1.14	1.11	0.61	2.05	495	2.04	2.50	1.27	1.64						
	Total	6310	100	100	100	100	24092	100	100	100	100						

<sup>1</sup> Reported values are mean values over the period 2010-2013. Reported values for Labor, Output and Exports are the sum of firm numbers of employees, the sum of firm turnover values and the sum of firm export values by industry respectively. Turnover is the sales excluding tax. For the full definition of variables, see Appendix C Source: Own calculation

Table 3.2 Our firm sample: breakdown by export status

<b>Firm kind</b>	<b>Firm number</b>	<b>Labor</b>	<b>Turnover</b>	<b>Exports</b>
<b>2000</b>				
Non-exporters	0.70	0.33	0.34	0.00
Ordinary exporters	0.23	0.46	0.58	0.59
Processing exporters	0.07	0.21	0.08	0.41
<b>2010-2013</b>				
Non-exporters	0.77	0.30	0.28	0.00
Ordinary exporters	0.19	0.53	0.66	0.22
Processing exporters	0.04	0.17	0.07	0.78

Note: Turnover is the sales excluding tax. Ordinary exporters are defined as exporters with export values lower or equal to turnover values. Processing exporters are exporters with export values greater than turnover values Source: Own calculation

exporters as *Export processing firms* or *Ordinary exporters* based on their export intensity values. Specifically, firms with export intensity above 1 are considered as primarily involved in processing firms while firms with export intensity below or equal to 1 are considered as ordinary exporters. Table 3.2 shows that in 2000, ordinary exporters were accounting for 23% in total firms and 59% of total exports while export processing firms were representing only 7% in the total number of firms (about 20% in the total number of exporters) and 41% of total exports. Compared to 2000, over the period 2010-2013, the share of ordinary exporters in the total number of firms has fallen to 19% while the share of export processing firms in the total number of firms has fallen to 4%<sup>8</sup>. The most striking feature of Table 3.2 is that the share of total exports of export processing firms has increased to 78% (instead of the 41% of the year 2000). On the other hand, those firms account for only 17% of the labor force engaged in Manufacturing and 7% of manufacturing value added over years 2010-2013 (two shares which have slightly declined since the year 2000). By contrast, ordinary exporters

<sup>8</sup>This fact witnesses the rapid development of manufacturing industries in Vietnam over 2000-2013. A lot of new domestic firms entered those industries automatically driving down export participation rates. According to ESCAP (2015), this drop can also be a consequence of the 2008-2009 economic crisis which has induced a strong decline of exports in the Asia-Pacific region.

account for 53% of the labor force engaged in Manufacturing and 66% of manufacturing value added over years 2010-2013 (two shares which have strongly increased since the year 2000).

Finally, in Table 3.3, we present the structure of our sample according to firm ownership (domestic versus foreign-owned) and firm location (in or out NTZ). Table 3.3 shows that, although domestic firms still account for the overwhelming number of firms, the number of foreign firms has increased more strongly than the one of domestic firms. In fact, the average number of foreign firms over the period 2010-2013 has increased by a factor of 5.17 compared to 2000 while the similar figure of domestic firms represents a factor of 3.65. In addition, foreign firms are more likely to be located in NTZ than domestic firms. Basically, 26% of foreign firms are located in NTZ while only 1% of domestic firms are operating in NTZ.

Table 3.3 Our firm sample: breakdown by ownership and location types

Ownership	2000	2010-2013 <sup>1</sup>		
	All firms	All firms	Firms out NTZ	Firms in NTZ
Domestic owned firms	5620	20523	20317	207
Foreign owned firms	690	3568	2650	918
All	6310	24092	22967	1125

<sup>1</sup> reported values are mean values over the period 2010-2013. Source: own calculation

### 3.4 On Vietnamese exporters

We start this section by an overview on Vietnam's exports across years and by firm ownership types. Clearly, Vietnam's export revenue has extraordinarily expanded since the late-1990s. Table 3.4 shows that over the period 1995-2014, Vietnam's export sales increased at an annual average rate of over 20%. In the same period, the country's GDP also grew rapidly

with an annual rate of over 7%. The proportion of exports in GDP increased steadily, from around 20% in the period of 1986-1990 to 65% in 2000-2013<sup>9</sup>. In 2012, the 5th year since the global economic crisis, being strongly influenced by changes in the world economy, the economy of Vietnam grew by 5.03% which is the lowest level since 2000. In this context, the total export and import turnover of Vietnam still achieved double-digit growth with a value of US \$ 228.32 billion, increased by 12.1% compared with 2011, of which export reached US \$ 114.53 billion, increased by 18.2% (equivalent to US \$ 17.62 billion). Despite many difficulties, exports of 2013 continued growing. According to the GSO (2012), exports reached US \$ 132 billion, 15.3% higher than 2012. In 2014, for the first time, Vietnam's export reached the record value of US\$150 billion. Clearly, exports are considered as an engine for growth by the country. This means that the role of exporters is increasingly important in the Vietnamese economy. Table 3.4 also shows that the share of foreign-owned firms is continuously increasing in total export values. In details, export share of foreign-owned firms rose strongly from 11% in 1996 to 63% in 2014 while that of domestic firms fell from 89% in 1996 to 38% in 2014. Table 3.5 further documents that processing commodities are the largest contributor to the Vietnam's outbound growth of exports. Indeed, the export share of export-processing trade rose from 46.15% in 2005 to 70.67% in 2014. On the other hand, the share of non-processing trade fell from 52.34% in 2005 to 27.98% in 2014. These figures are quietly close to the ones we reported in Table 3.2. In Table 3.6, we present main characteristics of Vietnamese Exporters in terms of likelihood, average size (relatively to non exporting firms) and average export intensity. As Vietnamese exporters are unequally distributed across manufacturing industries, we present those descriptive statistics for each of our 15 industries separately. Similar to the result reported in Table 3.1, from 2000 to the period 2010-2013, 9 out of 15 sectors registered a drop in their export participation rate. However, average firm export intensities in these sectors have strongly increased. On average, over the period 2010-2013, sectors holding the highest export participation rates include

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<sup>9</sup>See furthermore A1 in Appendix

Table 3.4 Vietnam's export overview by years and by ownership types

Year	All of firms			Foreign owned firms			Domestic firms				
	Value (Bil. US \$)	Annual change (%)	Value (Bil. US \$)	Annual change (%)	Share in All exports (%)	Value (Bil. US \$)	Annual change (%)	Share in All exports (%)	Value (Bil. US \$)	Annual change (%)	Share in All exports (%)
1995	5.2	-	-	-	-	-	-	-	-	-	-
1996	7.3	39.6	0.8	-	10.8	6.5	-	89.2	6.5	-	89.2
1997	8.8	20.7	1.5	90.5	17.1	7.3	12.2	82.9	7.3	12.2	82.9
1998	9.3	6.5	2.0	32.4	21.3	7.3	1.1	78.7	7.3	1.1	78.7
1999	11.5	23.6	2.6	30.7	22.5	8.9	21.6	77.5	8.9	21.6	77.5
2000	14.5	25.4	3.3	27.7	22.9	11.1	24.8	77.1	11.1	24.8	77.1
2001	15.0	4.0	3.7	11.0	24.4	11.4	1.9	75.6	11.4	1.9	75.6
2002	16.7	11.2	4.6	25.3	27.5	12.1	6.6	72.5	12.1	6.6	72.5
2003	20.2	20.8	6.3	37.8	31.4	13.8	14.3	68.6	13.8	14.3	68.6
2004	26.5	31.4	8.8	39.1	37.0	17.7	27.8	66.7	17.7	27.8	66.7
2005	32.4	22.4	11.2	26.8	34.5	21.3	20.2	65.5	21.3	20.2	65.5
2006	39.8	22.8	14.8	31.9	37.0	25.1	17.9	63.0	25.1	17.9	63.0
2007	48.6	21.9	19.3	30.8	39.7	29.3	16.7	60.3	29.3	16.7	60.3
2008	62.7	29.1	24.2	25.3	38.6	38.5	31.6	61.4	38.5	31.6	61.4
2009	57.1	-8.9	24.2	0.0	42.3	32.9	-14.5	57.7	32.9	-14.5	57.7
2010	72.2	26.5	34.1	41.2	47.2	38.1	15.8	52.8	38.1	15.8	52.8
2011	96.9	34.2	47.9	40.3	49.4	49.0	28.7	50.6	49.0	28.7	50.6
2012	114.5	18.2	64.0	33.7	55.9	50.5	3.0	44.1	50.5	3.0	44.1
2013	132.0	15.3	80.9	26.4	61.3	51.1	1.2	38.7	51.1	1.2	38.7
2014	150.2	13.8	94.0	16.1	62.5	56.3	10.1	37.5	56.3	10.1	37.5

Note: These data excluded the value of exported crude oil.

Source: Customs Handbook on International merchandise statistics of Vietnam, 2014

Table 3.5 Vietnam's export by main customs procedure

Year	Total		Outright exportation		Processing trade		Others	
	Value (Mil. US \$)	Share in total (%)	Value (Mil. US \$)	Share in total (%)	Value (Mil. US \$)	Share in total (%)	Value (Mil. US \$)	Share in total (%)
2005	32,441	52.34	16,980	46.16	14,975	47.47	486	1.50
2006	39,826	50.74	20,206	49.63	18,906	47.26	714	1.79
2007	48,562	48.81	23,705	50.49	24,103	54.35	754	1.55
2008	62,684	50.03	31,361	56.45	29,627	63.08	1,696	2.71
2009	57,096	47.56	27,154	69.02	28,828	70.67	1,114	1.95
2010	72,237	43.76	31,610	43.76	39,261	56.45	1,366	1.89
2011	96,906	41.30	40,020	41.30	54,703	56.45	2,183	2.25
2012	114,529	35.15	40,260	35.15	72,248	63.08	2,021	1.76
2013	132,033	29.90	39,481	29.90	91,127	69.02	1,425	1.08
2014	150,216	27.98	42,026	27.98	106,158	70.67	2,032	1.35

Note: These data were revised by new customs procedures applied in 2014

Source: Customs Handbook on International merchandise statistics of Vietnam, 2014



*Computer and electronics* (47%), *Motor vehicles* (47%), *Clothing and leather* (35%); the highest average firm export intensities are the ones of *Clothing and leather* (402%), *Chemical and rubber plastics* (347%), *Textile products* (237%), and *Computer and electronics* (236%). It is noticeable that, over the period 2010-2013, the majority of sectors hold average firm export intensities above 1 (in 2000, only 3 out of 15 sectors were in this case). Those sectors are also characterized by high average relative size of exporters (in terms of number of workers). This result is consistent with the trend of other developing countries which engage in Global value chains especially in labor intensive sectors to take advantage of their cheap labor. A strong difference between industrialized countries and emerging ones concerns the

Table 3.6 Participation rate, relative size &amp; export intensity, by industry

ID	Industry	2000			2010-2013 <sup>1</sup>		
		PR	RS	EI	PR	RS	EI
1	food, beverage & tobacco	0.24	6.43	0.21	0.25	4.99	0.97
2	textile products	0.39	4.14	0.31	0.27	5.10	2.37
3	clothing & leather	0.72	4.53	1.55	0.35	9.49	4.02
4	wood & paper	0.29	3.98	1.46	0.17	3.64	2.29
5	printing, publishing & recording	0.06	2.28	0.02	0.05	4.46	0.54
6	chemical, rubber plastics	0.35	2.64	0.21	0.27	4.34	3.47
7	pharmaceuticals	0.27	1.93	0.07	0.25	4.13	0.04
8	mineral products	0.12	1.69	0.08	0.10	3.34	0.51
9	basic metal & metal products	0.19	3.97	0.13	0.13	5.43	0.60
10	computer & electronic products	0.45	2.14	0.35	0.47	9.30	2.36
11	machinery & apparatus	0.19	2.93	0.18	0.24	8.83	1.07
12	motor vehicles	0.11	2.33	0.06	0.47	3.62	2.55
13	transportation equipments	0.18	2.57	0.09	0.27	5.94	0.99
14	house equipments	0.39	5.57	0.40	0.31	8.50	1.15
15	manufacturing, n.e.c	0.47	4.77	3.28	0.43	5.76	3.58

<sup>1</sup> reported values are mean values over the period 2010-2013

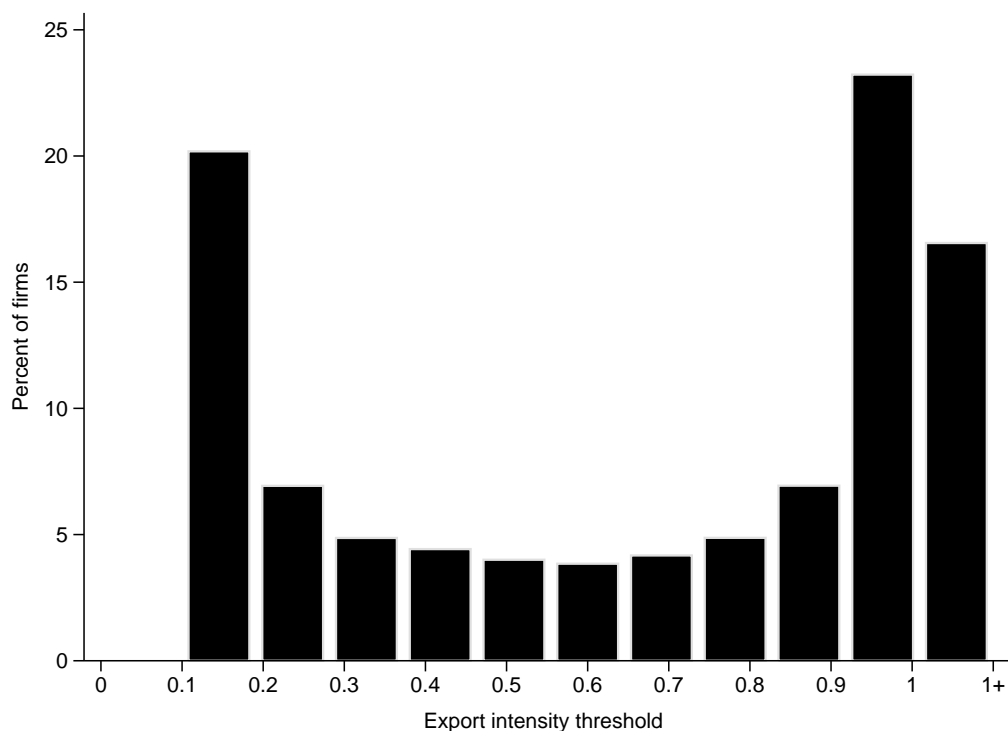
PR: participation rate is the number of exporters over the total number of firms by sector; RS: relative size is the mean number of employees of exporters over the mean number of employees of non-exporters; EI: export intensity is the mean ratio of export over sales for exporters only;

Source: Own calculation

distribution of firm export intensities. While this distribution is monotonically decreasing in all industrialized countries, it has proved to be U-shaped in some emerging economies,

especially the ones which take a large part in global value chains as China, Mexico, etc. We then investigate whether this U-shaped pattern also holds for Vietnam.

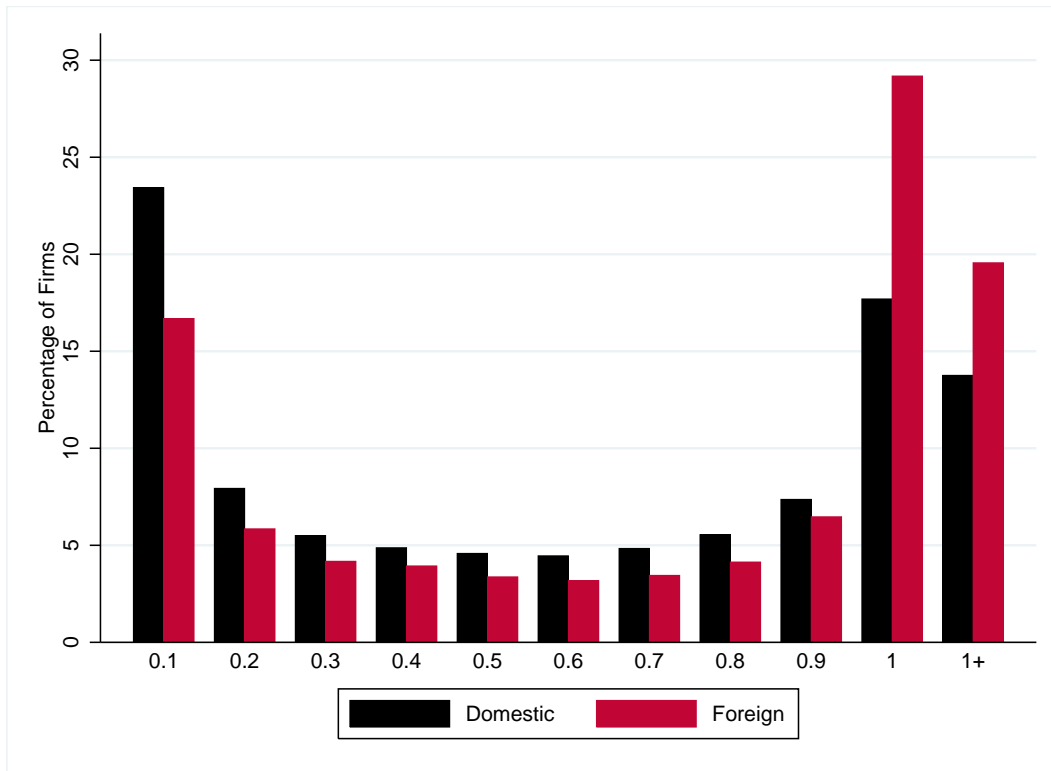
Figure 3.1 Distribution of Vietnamese exporting firms by export intensity, 2010-2013



For the entire panel, Figure 3.1 postpones, in X-axis, the distribution of firms according to their export intensity per interval of 10%, while in Y-axis, the percentage of exporting firms belonging to each class of export intensity. For example, according to this Figure, about 20% of exporting firms have export intensities lower than 10%. This percentage of the group with export intensity higher than 90% is about 24. Especially, the group with export intensity higher than 100% account for nearly 16%. This implies that there exists in Vietnam, a quite high number of firms who export not only 100% of their sales but also more than that. According to our hypothesis in the previous section, that is the group of processing exporters. Clearly, the export intensity of Vietnamese exporting firms exhibits a U-shaped distribution. This pattern is quietly different to the French case where the export intensity indicates a decreasing pattern (Bellone et al. (2008)). That means the percentage of

exporting firms decreases by the increase of export intensity. Meanwhile, the Vietnamese export intensity pattern is similar to the one found for China<sup>10</sup>.

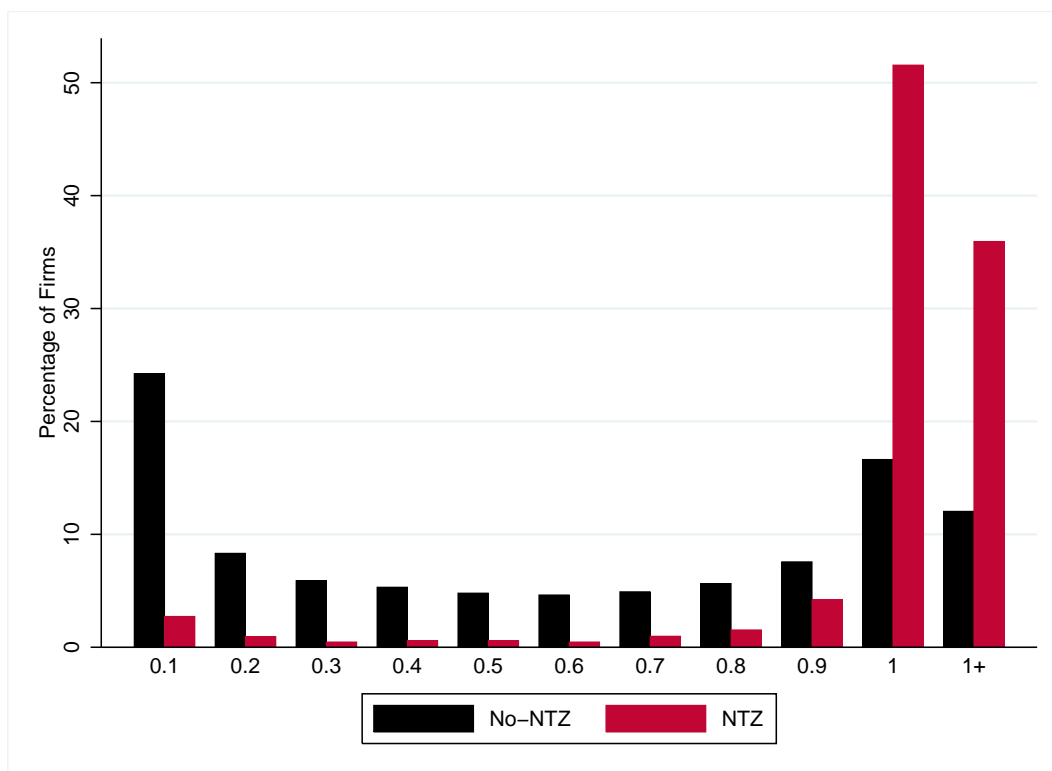
Figure 3.2 Histogram of Exporter's Export Intensity: Foreign vs. Domestic



The U-shaped distribution could be explained by the fact that many firms are foreign-owned firms that serve as an exporting platform for foreign countries. So, they must sell a larger fraction of output than domestic exporting firms. To see whether this argument can explain the pattern, we plot the export intensity for the different groups of domestic and foreign-owned firms in Figure 3.2. The Figure indicates that foreign-owned firms export a larger fraction than domestic exporting firms. Absolutely, about 50% of foreign-owned firms export more than 100% of their output. This figure of domestic firms is nearly 32%. However, among domestic firms, the distribution of export intensity is still U-shaped. To further investigate the impact of processing trade, we also plot the export intensity of firms

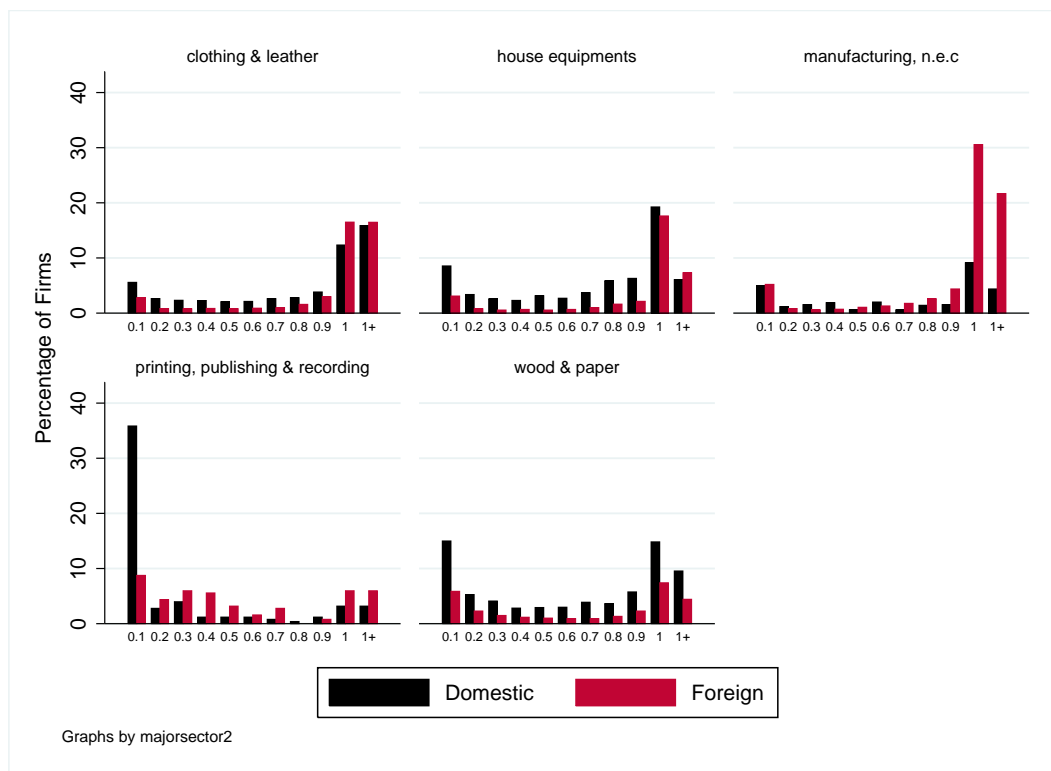
<sup>10</sup>Lu (2010) showed that fewer than 20% of Chinese exporters sell less than 10% of their output abroad, while about 40% of them export more than 90% of their output.

Figure 3.3 Histogram of Exporter's Export Intensity: firms operating in or out Non Tariff Zones



for different sub-samples of NTZ firms and No- NTZ firms. Firms operating in NTZ can import intermediate materials without a tariff and usually work on assembling or processing trade, with their main markets being the foreign markets (Dan Lu (2010), p.9). Then, firms operating in NTZ must export a larger fraction of output than firms operating outside NTZ. Very certainly, as Figure 3.3 indicates, the export intensity distribution of exporters operating outside NTZ is bimodal while this pattern among their NTZ counterparts is almost uni-modal: fewer than 5% of firms operating in NTZ export less than 10% of their sales while around 90% of them export more than 100%. The corresponding percentages for firms operating outside NTZ are 25% and 30% respectively.

Figure 3.4 Histogram of Exporter's Export Intensity: Labor intensive Sectors



Finally, we plot the histogram of firm export intensities by sectors grouped by their factor intensity. Respectively, Figures 3.4, 3.5 and 3.6 show the distribution of firm export intensities in sectors with low, medium and high capital labor ratio. In these Figures, we also discriminate between foreign-owned and domestic firms. Figure 3.6 shows that the

Figure 3.5 Histogram of Exporter's Export Intensity: Capital Labor Ratio in the Middle Range

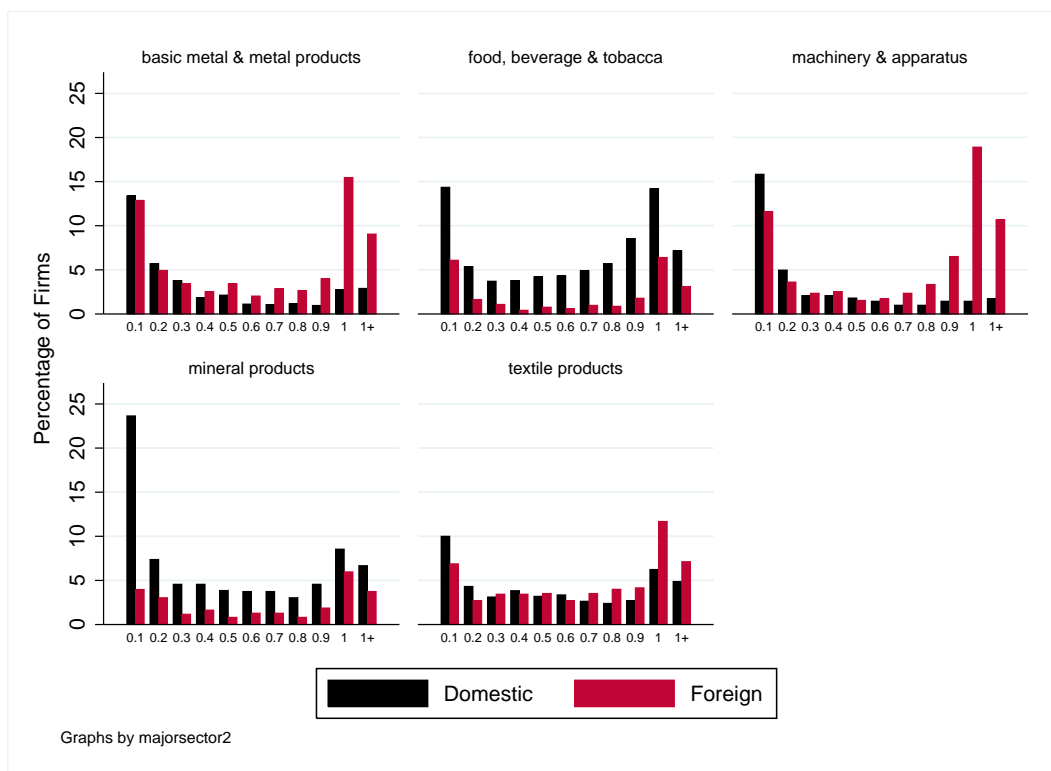
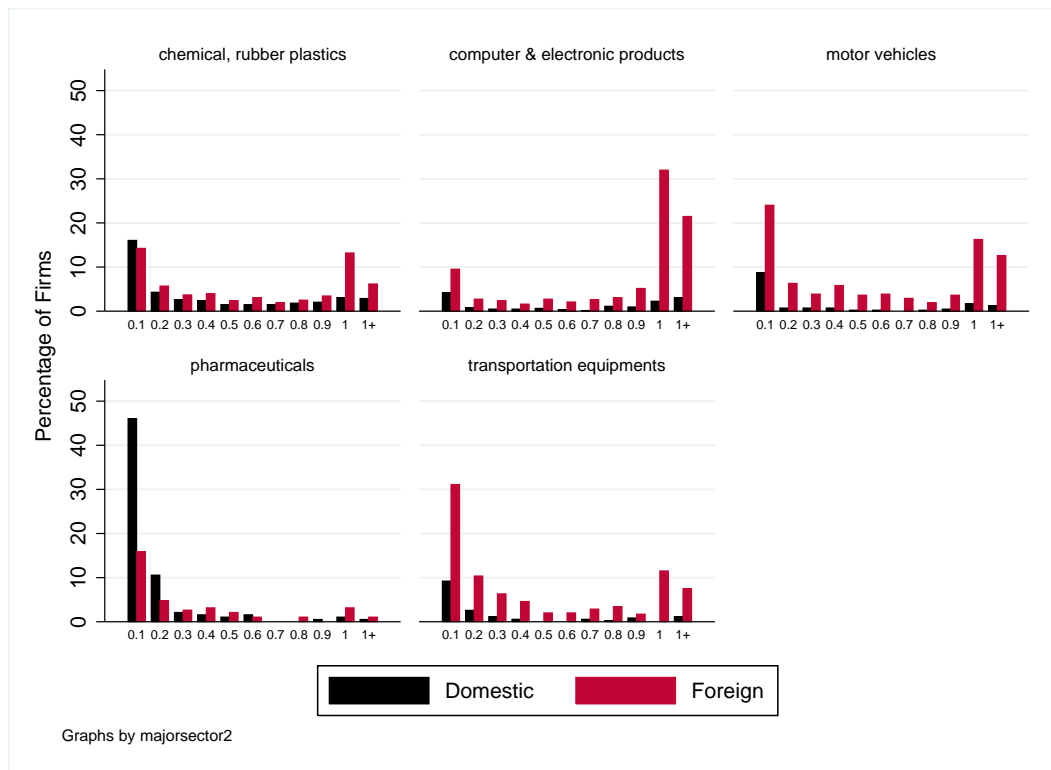


Figure 3.6 Histogram of Exporter's Export Intensity: capital intensive sectors



presence of foreign firms in capital intensive sectors is overwhelmed in comparison with that of domestic firms while their presence in labor intensive sectors (Figure 3.4) is more modest than the one of their domestic counterparts. Besides, a common pattern of these 3 Figures is that the export intensity distribution of foreign-owned firms is more concentrated to the right hand side which means that, on average foreign-owned firms sell relatively more abroad than domestic firms.

Shortly, foreign-owned firms play a significant role in total export values of Vietnam; of which processing trade is considered as the largest contributor to the Vietnam's export growth. On the other side, though foreign-owned firms export more than their domestic counterparts, these latter ones also take a larger part in processing trade. Finally, like other countries strongly involved in GVCs, the export intensity distribution of Vietnamese exporters usually exhibits a U-shaped pattern.

### 3.5 Export premia for ordinary and processing exporters

In this section, we further investigate *export premia* differentiating ordinary and export processing exporters. We start with non-parametric measures by defining *export premia* as systematic differences in *some* characteristics of exporting firms compared to non-exporting ones, that are over and above mere industry effects, year-specific effects or cohort effects. Specifically, we look at series of variables  $X_{it}$ , where subscripts  $i$  and  $t$  stand for firm  $i$  at time  $t$ . We subtract from all  $X_{it}$  the industry fixed effect  $s_j$ , a year fixed effect  $d_t$  and cohort fixed effect  $v_c$  in order to obtain  $X'_{it} = X_{it} - s_j - d_t - v_c$ , where all fixed effect are defined as differences of group means from overall sample mean.

The performance variable  $X$  is alternatively main firm characteristics, as Turnover (Y), Labour (L), capital intensity, wage per employees<sup>11</sup>, and productivity indexes. Productivity indexes are computed alternatively as Labor Productivity ( $Y/L$ ) and Total Factor Productivity (TFP). For the latter, we use the non-parametric methodology proposed by Caves et al. (1982) and further extended by Good et al. (1997) which has been popularised in the export-productivity literature thanks to the contributions by Aw et al. (2000), Delgado et al. (2002), and Bellone et al. (2014)<sup>12</sup>. In Table 3.7, we present non parametric export premia for the whole sample of firms and then for firms discriminated according to their ownership and location. All reported values for firm characteristics are expressed relatively to non-exporting firms.<sup>13</sup>

Statistics reported in our global sample show that Vietnamese exporters display a strong *export premia* over their non-exporting counterparts. In terms of turnover and labor, exporters are on average 5 times larger than non-exporters. In terms of productivity, exporters

<sup>11</sup>See Appendix A in Chapter 2 for full definitions

<sup>12</sup>See Appendix B in Chapter 2 for details

<sup>13</sup>Relative values for the *export premium* are computed as the ratio of the mean value of exporting firms ( $\overline{X'_E}$ ) over non-exporting firms ( $\overline{X'_{NE}}$ ), multiplied by a 100.



Table 3.7 The Export Premia: ordinary and export processing firms, by ownership and location, 2010-2013

Location/ownership types	All firms	Domestic owned firms		Foreign owned firms		
	All	No-NTZ	NTZ	All	No-NTZ	NTZ
Output (Y)	499.31	307.48	306.79	157.67	194.41	379.72
Ordinary exporters	524.24	324.09	324.95	154.05	203.32	444.15
Processing exporters	373.61	203.35	180.51	164.58	123.98	266.25
Labour (L)	477.62	296.94	283.51	237.84	311.94	305.49
Ordinary exporters	438.92	276.49	266.63	228.89	293.61	311.71
Processing exporters	672.74	425.09	400.87	254.93	456.86	294.53
Capital Intensity (intcap)	168.35	132.79	130.59	137.37	95.82	117.50
Ordinary exporters	171.99	135.46	134.23	132.28	99.56	119.94
Processing exporters	149.99	116.03	105.27	147.09	80.47	113.21
Wage per employee (wpe)	128.54	117.37	117.28	115.86	87.21	96.92
Ordinary exporters	130.31	118.82	118.79	116.49	86.51	95.26
Processing exporters	119.62	108.29	106.80	114.67	76.33	99.83
Total factor Productivity (lnTFP)	169.60	132.68	129.93	119.61	81.11	77.90
Ordinary exporters	170.23	136.10	134.16	121.28	81.95	80.72
Processing exporters	166.43	111.25	100.53	116.42	77.63	72.94
Labour productivity (alp)	167.37	133.62	133.81	119.62	83.78	108.14
Ordinary exporters	177.11	138.51	139.23	112.29	91.28	112.73
Processing exporters	118.27	102.95	96.18	133.62	52.95	100.05
Capital productivity (akp)	83.92	116.41	122.23	14.92	42.43	80.57
Ordinary exporters	91.20	125.21	129.62	22.44	45.13	50.06
Processing exporters	47.20	61.28	70.84	0.56	31.31	134.30

Ordinary exporters are defined as firms with export values lower or equal to turnover values. Processing exporters are defined as firms with export values higher than turnover values. NTZ defined firms located in a non tariff zone and non NTZ defined firms located outside NTZ. All values are net of industry, year and cohort specific effects. Relative values for the export premium are computed as the ratio of the mean of exporting firms over the mean of non-exporting firms, multiplied by 100.  
Source: Own calculation

also dominate non-exporters except for capital productivity. However, when we distinguish domestic and foreign-owned firms, we find that the expected pattern of the strong export premia holds among domestic firms but not among foreign-owned firms. Specifically, within domestic firms, exporters outperform their non-exporting counterparts (i.e. same industry, same cohort, same year) according to all margins (turnover, size, capital intensity, average wage per employees, TFP, labor productivity and capital productivity). On the other hand, within foreign-owned firms, exporters outperform their non-exporting counterparts only in terms of turnover and labor. In terms of productivity, foreign-owned exporters *under*-perform foreign-owned non-exporters. While striking, this feature is in line with Lu et al. (2010) who found that among foreign affiliates, Chinese exporters are less productive than Chinese non-exporters.

When we differentiate firms according to their location in or out NTZ, we find that the NTZ status plays differently for domestic and foreign-owned firms. In the case of domestic firms, export premia are smaller among firms located in NTZ than among firms located outside NTZ (this is true in all margins except in terms of capital intensity). This feature can be explained by the fact that there are very few non-exporting firms in NTZ and that those firms are likely to be closely related to export activities as they are located in zones dedicated to serving export markets. On that respect, we may conjecture that those firms benefit from knowledge spillovers from their exporting counterparts localized in NTZ as well<sup>14</sup>. However, in the case of foreign-owned firms, we find a different pattern. For those firms, remember that export premia are negative in all margins except size. However, for firms operating in NTZ firms, those gaps are smaller than for firms operating outside NTZ.

We next estimate the export *premia* parametrically by regressing some of firm characteristics over their export status discriminating ordinary and processing exporters.

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<sup>14</sup>Sample size are very small here as domestic firms located in NTZ represent only 1% of our sample of domestic firms. Measurement errors can strongly bias our results for those subsamples of firms

In our preferred specification, we introduce industry, year and cohort fixed effects and also control for size, ownership, and capital intensity. As for our dependent variables, our main variables of interest are TFP, labor productivity, capital productivity and average wage per worker. As we use two alternative means to identify processing firms, we build two specifications under these two ways. In the first specification, we discriminate processing exporters as exporters with export intensity above 1 (specification 3.1); in the second one we discriminate exporting firms according to their location in or out NTZ. Specifically, we estimate the following equations:

$$Y_{ijkt} = \alpha + \beta_1 X1_{ijkt} + \beta_2 X2_{ijkt} + \gamma D + e_{ijkt} \quad (3.1)$$

$$Y_{ijkt} = \alpha + \beta_1 Expdum_{ijkt} + \beta_2 NTZ_{ijkt} + \gamma D + e_{ijkt} \quad (3.2)$$

where  $Y_{ijkt}$  denotes the dependent variable of interest (in logs) for firm  $i$ , in industry  $j$ , cohort  $k$  and time  $t$ .  $X1_{ijkt}$  is a dummy which equals one if firm has export intensity lower than 1.  $X2_{ijkt}$  is the dummy for firms with export intensity higher than 1.  $Expdum_{ijkt}$  is a dummy which equals one if firm has exports more than zero.  $NTZ_{ijkt}$  is a dummy which equals one if firm is located in an NTZ.  $D$  stands for industry, cohort and year fixed effects and other controls such as size, ownership and capital intensity (in logs).

Results of the first specification are presented in Table 3.8 while results of the second specification are presented in Table 3.9. In both tables, the first column demonstrates the regression result when labor productivity is used as dependent variable. The result of the same regression but with capital productivity, total factor productivity (TFP) and wage per worker as dependent variable are presented in column (2), (3) and (4) respectively. Table 3.8 shows that ordinary exporters behave consistently with the Melitz (2003) model. They are more productive than non-exporters and pay higher wage per employee. On the other hand, processing exporters are less productive than non-exporters and do not pay higher wages.

More specifically, processing exporters are nearly 18% less productive than non-exporters. Table 3.9 shows that productivity decreases significantly for NTZ firms, indicating once again that processing firms under-perform both ordinary exporters and non exporting firms. In sum, these results shed light on the fact that only processing exporters demonstrate counter-Melitz productivity pattern, comforting the previous findings by Dai et al. (2016) on China.

Table 3.8 Export premium in terms of trade types, OLS regression

Independent Variables	Dependent variables			
	lnalp	lnalk	lnthp	lnwpe
Ordinary exporters	0.156*** (0.00857)	0.153*** (0.00822)	0.156*** (0.00858)	0.135*** (0.00591)
Processing exporters	-0.182*** (0.0156)	-0.176*** (0.0150)	-0.182*** (0.0156)	-0.0119 (0.0108)
Foreign owned dummy	0.389*** (0.00934)	0.387*** (0.00896)	0.389*** (0.00935)	0.256*** (0.00644)
Labor	0.0636*** (0.00270)	0.0620*** (0.00259)	1.064*** (0.00270)	0.0353*** (0.00186)
Capital intensity	0.217*** (0.00189)	-0.771*** (0.00182)	0.217*** (0.00190)	0.0914*** (0.00131)
Constant	3.167*** (0.416)	3.159*** (0.399)	-4.401*** (0.417)	3.244*** (0.287)
Observations	96,366	96,366	96,366	96,366
R-squared	0.260	0.683	0.771	0.236

Note: Standard errors in parentheses (\*\*\*)  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . All values are net of industry, year and cohort specific effects. Source: Own calculation

We refine the analysis of the export premia by investigated those premia in K/L range graphically. Specifically, the average labor productivity in terms of value added per worker is also examined for exporters and non-exporters across different sectors. The x-axes of Figure 3.7 and 3.8 are the median capital labor ratio of sectors. Generally, pure exporters, consistent with Melitz (2003) literature, have highest productivity even in labor-intensive sectors while the positions of processing exporters and non-exporters are ambiguous. Figure 3.8 plots the differences in value added per worker between exporters and non-

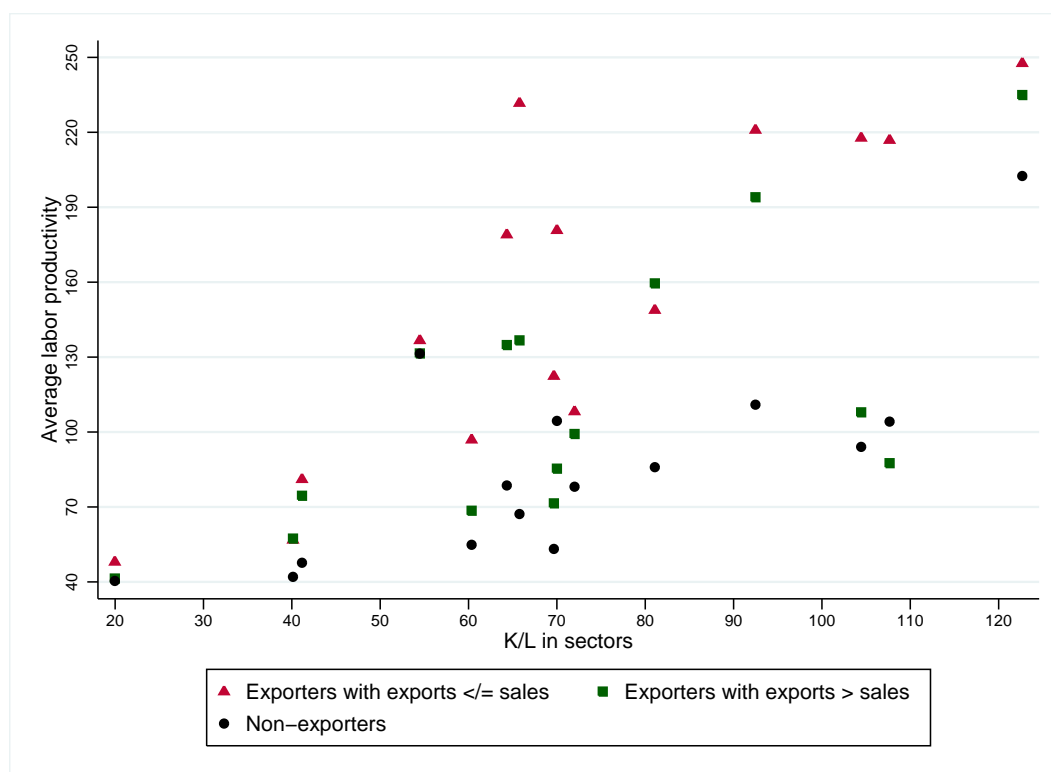
Table 3.9 Export premium in terms of NTZ firms, OLS regression

Independent Variables	Dependent variables			
	lnalp	lnalk	lnfp	lnwpe
Export status dummy	0.135*** (0.00839)	0.133*** (0.00804)	0.135*** (0.00840)	0.126*** (0.00578)
NTZ dummy	-0.305*** (0.0144)	-0.298*** (0.0138)	-0.305*** (0.0144)	-0.135*** (0.00991)
Foreign owned dummy	0.427*** (0.00962)	0.424*** (0.00922)	0.427*** (0.00963)	0.272*** (0.00663)
Labor	0.0667*** (0.00271)	0.0650*** (0.00260)	1.067*** (0.00271)	0.0367*** (0.00187)
Capital intensity	0.220*** (0.00190)	-0.769*** (0.00182)	0.220*** (0.00190)	0.0926*** (0.00131)
Constant	3.158*** (0.416)	3.151*** (0.399)	-4.409*** (0.417)	3.240*** (0.287)
Observations	96,366	96,366	96,366	96,366
R-squared	0.260	0.683	0.771	0.236

Note: Standard errors in parentheses (\*\*\* p<0.01, \*\* p<0.05, \* p<0.1). All values are net of industry, year and cohort specific effects. Source: Own calculation

exporters for each sector. Exporter advantage increases with capital intensity. The differences are negative for labor-intensive sectors, meaning that exporters have lower values in labor productivity in these sectors. In addition, ordinary exporters are more productive than their processing counterparts.

Figure 3.7 Exporters vs. Non-Exporters Productivity across Sectors



Following Lu (2010), we also rank firms by their capital labor ratio and group them into 100 bins to explore the relationship between factor intensity and productivity differences. Within each group, firms are showing a very similar capital labor ratio. Figure 3.9 plots the mean level of log value added per worker of exporters and non-exporters across different capital labor ratio bins. As expected, exporters and non-exporters productivity difference has a significant positive relation with the capital labor ratio. Exporters are mostly more productive than non-exporters not only in capital intensive sectors but also in labor intensive sectors. Once again, our data shows that processing exporters are less productive than pure exporters and even than non-exporters.

Figure 3.8 Exporters Advantage across Sectors

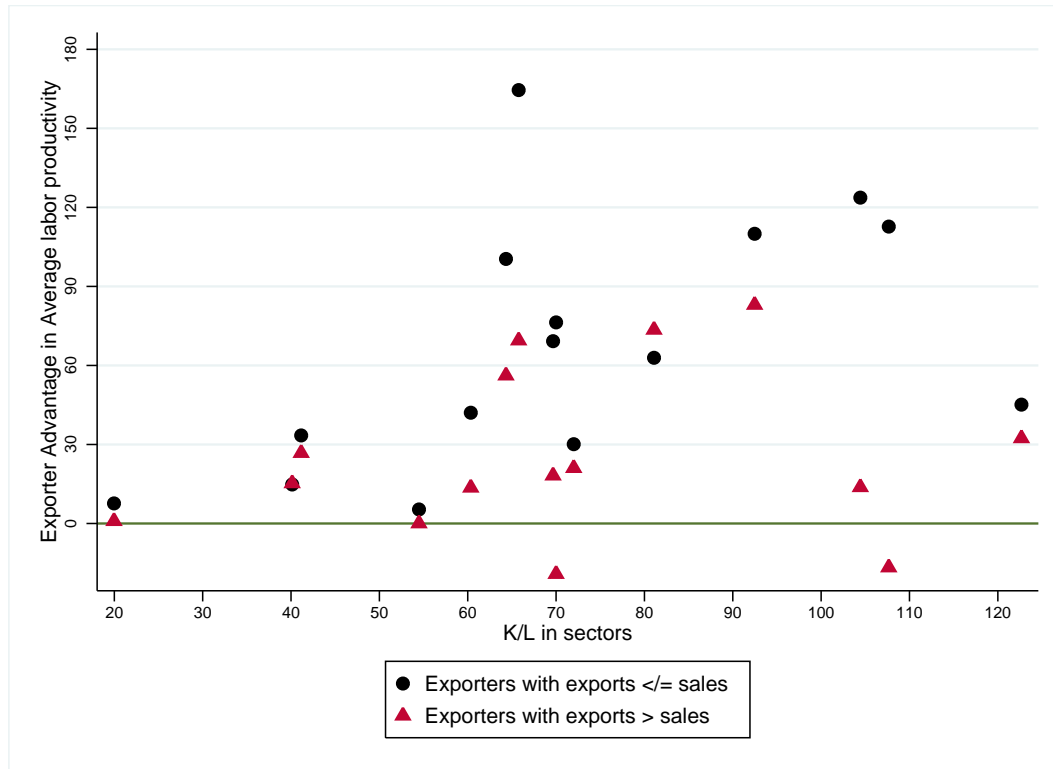


Figure 3.10 shows the differences between the value of exporters and non-exporters with the 95% confidence intervals. Furthermore, we consider separately the advantage in terms of productivity by K/L range of two groups of exporters (i.e. Ordinary vs Processing exporters). We see that ordinary exporters have positive productivity advantage while processing exporters show negative values.

Figure 3.9 Exporters vs. Non-exporters Productivity across Different K/L Bins

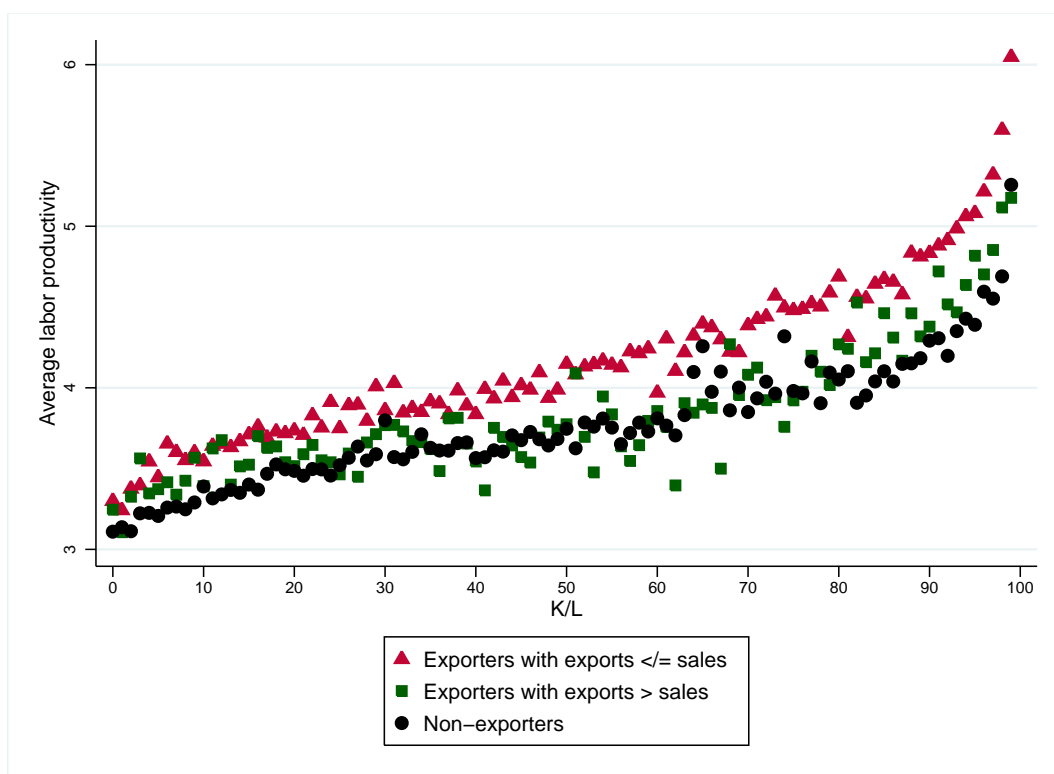
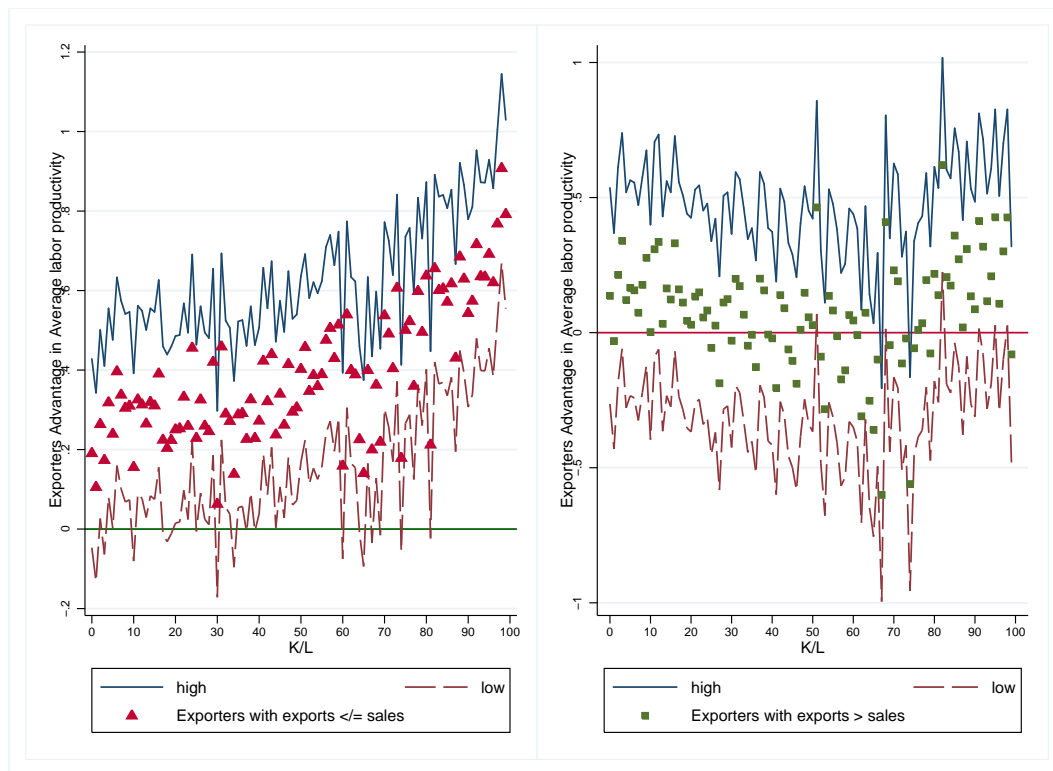




Figure 3.10 Exporter Advantage across different K/L bins



### **3.6 Alternative measurement of regression**

By using OLS to estimate specifications 3.1 and 3.2, there is a number of possible concerns that our results might deal with, such as heteroskedasticity, autocorrelation or multicollinearity. Consequently, in this section, we perform some other alternative methods to regress these specifications in order to check the robustness of our findings. We carry out specifications 3.1 and 3.2 using different productivity measures (i.e. labor productivity, capital productivity, total factor productivity, wage per worker) which are represented in Tables from F1. to F8. in Appendix F. We run regressions by using different Generalized Least Squares (GLS) models which are considered more efficient than the default OLS under heteroscedasticity or autocorrelation. Results of the between-effects model are reported in column 1 of each table. In column 2, we estimate models by the weighted least squares technique. This is one method for dealing with heteroscedasticity and fitting for the unbalanced data. Lastly, column 3 runs our regressions applying random effects maximum likelihood (MLE). The advantage of specific MLE procedures is that greater efficiency and better numerical stability can often be obtained by taking advantage of the properties of the specific estimation problem. In all the above cases, results are qualitatively similar in comparison with our regression results reported in the section 3.5. That means processing exporters are generally the least productive firms exhibiting by the negative coefficients of the dummies nominated processing firms.

### **3.7 Conclusion**

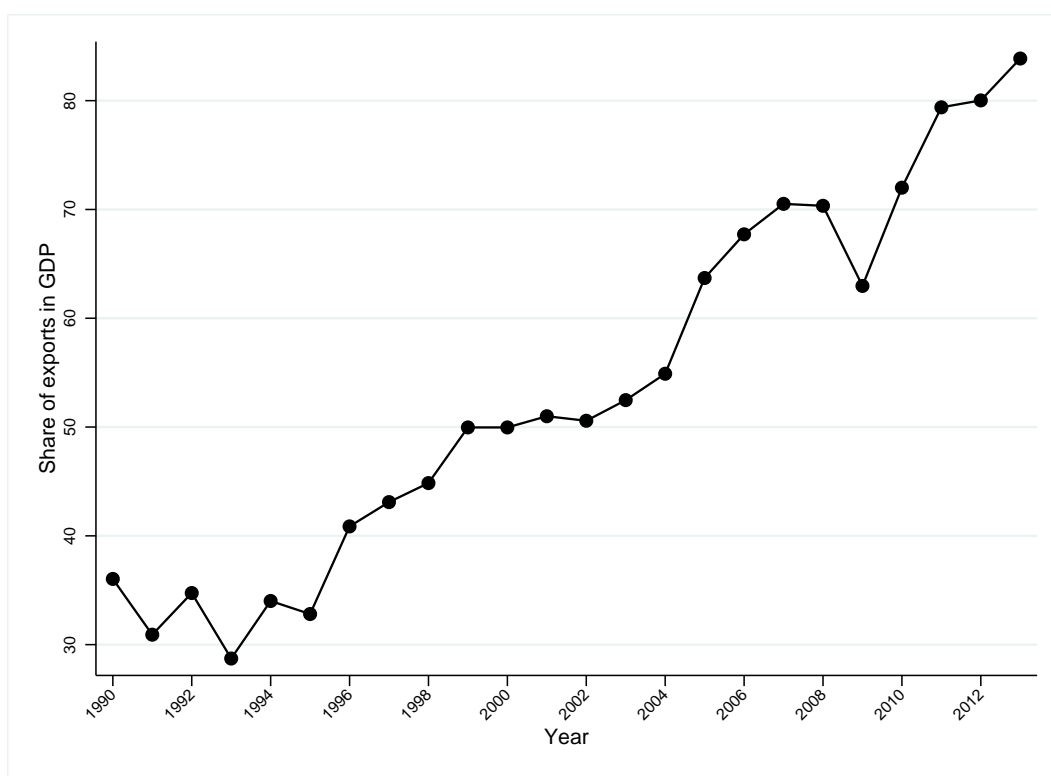
The new trade theory emphasizes firm heterogeneity and exceptional characteristics and performance of exporting firms compared to non-exporters together with the importance of exporting firms in industry measures such as turnover, employment and wages. By

now a number of empirical studies for various countries exist which confirm this pattern. Nonetheless, some recent studies on China demonstrate that exporters under-perform non-exporters. This study is an effort to provide new evidence along these lines for Vietnamese manufacturing firms. Based on firm level data provided by GSO, we presented evidence on the relative performance of exporting firms in Vietnam manufacturing sectors at 2-digit level. We showed that this anomalous pattern displays more outstanding among foreign-owned firms and firms operating in NTZ. Furthermore, we indicate that the existence of processing firms who are the least productive compared to all other types of firms is the principle driver of the exceptional exporting behavior of countries that engage strongly to the Global value chains. Removing processing exporters allows to reestablish the traditional finding that exporters over-perform non-exporters. Last but not least, our results signify that processing trade is an outstanding activity should be investigated separately relative to other types of trade for specifying its contribution to productivity and wages dynamics in emerging economies.

# Appendix

## A Share of exports in GDP across years

Figure A1 Share of exports in GDP, 1990-2013



Source: Own calculation on basis of World Bank database

## B Map of Industrial Parks in Vietnam

Figure B1 Map of Vietnam's Industrial and Export Processing Zones



Source: <http://khucongnghiep.com.vn/>

## C Main Variables Used in the Dataset

All nominal output and input variables are available at firm level. Industry level data are used for price indexes and depreciation rates.

**Average capital productivity.** Real value added over the real capital stock

**Foreign-owned enterprise.** According to OECD, a foreign owned enterprise is a firm with at least 10% of foreign ownership of the ordinary shares or voting power or the equivalent for unincorporated enterprises. Note that GSO data also provides another mean to identifying foreign owned firms. We can use a categorical variable which discriminates 8 different types of firms of which 5 are of the domestic type - State-owned enterprises (SOE), private firms, collective firms, national joint venture, mixed firms with both private and State capital- and 3 are of the foreign type - Fully foreign-owned firms, domestic SOE with foreign capital, domestic non-SOE with foreign capital. All our results are robust to a change of definition of the foreign and domestic firm type according to this classification.

**Export processing firms.** Export processing firms could be identified under two alternative ways. The first way bases on firm export intensity value. According to this, a firm with an export's value higher than its turnover value (i.e.  $\text{Export intensity} > 1$ ) is considered as a processing firm. The second way bases on firm location in Non-Tariff Zones. According to this, a firm is considered as a processing firm if it has a location code corresponding to an export processing zone or with a location code corresponding to any other special zones (industrial parks or economic zones) and exports more than 90% of their turnover.

**Non tariff zones.** The circular no 06/2012/BTC guiding the law on value added tax indicates that "Non-tariff zones include: processing and exporting zones, processing and exporting enterprises, bonded zones, bonded warehouse, special commercial and economic zones, commercial-industrial zones and other economic zones established and enjoying

preferential taxes similarly to non-tariff zones under the Prime Minister's Decisions". Also conforming to The decree no29/2008/ND-CP, "export processing zone means an industrial zone that specializes in the production of export goods, provision of services for export goods production and export activities, has specified geographical boundaries while export processing enterprise means an enterprise that is established and operates in an export processing zone or exports all its products and operates in an industrial zone or economic zone". Thus, an enterprise may apply legal provisions applicable to non-tariff areas if it locates in *export processing zone* or locates in *industrial/economic zone* and export 100% of its products.

**Economic zones.** Following *The Decree No. 29/2008/ND-CP*, there are three major types of economic zones in Vietnam which can apply to tariff exemptions: Industrial parks which mean economic zones that specialize in the production of industrial goods or provision of services for industrial production; Export processing zones which are industrial zones that specializes in the production of export goods, provision of services for export goods production and export activities; special economic zones which are zones that have a separate economic space with a particularly favorable investment and business environment for investors. An economic zone is organized into functional areas, including non-tariff area, bonded area, export processing area, industrial area, entertainment area, tourism area, urban area, residential area, administrative area and other functional areas suitable to characteristics of each economic zone.

**Exemption of import-export tax.** According to the article 3 of *The law no 45/2005/QH11 on import tax and export tax*, "goods exported from non-tariff zones to foreign countries, goods imported from foreign countries into non-tariff zones for use in non-tariff zones only, and goods transported from on non-tariff zone to another" are not liable to import tax or export tax. Also according to the clauses 4 and 10 of the article 16 mentioned

"tax exemption" in this law, import goods or export goods shall be exempt from import tax or export tax if these are "goods imported for processing for foreign partners then exported or goods exported to foreign countries for processing for Vietnam then re-imported under processing contracts"; or "goods produced, processed, re-cycled or assembled in non-tariff zones without the use of raw materials and accessories imported from foreign countries, when being imported into the domestic market; for cases of using raw materials and accessories imported from foreign countries, when goods are imported into the domestic market, only import tax on imported raw materials and supplies constituting these goods must be paid". In short, goods will be exempted from import-export tax if either these are export processing goods or goods in non-tariff zones.



**D Additional Summary statistics**

Table D1. Summary statistics 1 (Original sample)

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min.</b>	<b>Max.</b>	<b>N</b>
W (wage)	3824.877	32895.087	0	5856918	214858
sales (turnover)	49051.869	1218125.767	-377476	452008000	214858
VA (value added)	6543.268	381105.798	-160111952	62256880	214858
L (n. of workers)	91.074	595.717	0	84660	214858
K (capital)	15049.587	162541.528	-424515.594	30278974	212864
grossprofit (gross profit)	2005.203	133444.155	-1593702	53930804	214858
gtxk (exports)	76870.186	6589070.056	0	2331030784	214858
gtnk (imports)	57699.589	3412625.043	0	722217280	214858
ck (capital cost)	539.363	345859.751	-160119264	3380362.5	214858
sl (labor share)	1.149	18.679	-1704.935	1499.852	212736
sk (capital share)	-0.149	18.679	-1498.852	1705.935	212736
wpe (wage/labor)	36.316	160.671	0	32898	214736
intcap	147.5	601.751	-1353.437	85050.945	212764
alp (VA/labor)	45.604	1719.872	-590819	251675.172	214736
akp (K/Labor)	2.666	108.966	-39265	10165.5	192908
intexp (Exports/turnover)	1.767	236.898	-1.231	100496.82	201325
vaps (VA/turnover)	1.44	163.075	-51873.102	34955.461	201325
ppe (profit/labor)	0.451	1004.91	-241661.156	251619.203	214736
spe (turnover/labor)	464.389	3675.806	-128.088	757321.313	214736

Table D2. Summary statistics 2 (1st cleaning)

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min.</b>	<b>Max.</b>
W (wage)	7608.428	40477.055	1.788	4938306.5
sales (turnover)	103697.394	1882642.824	1.643	452008000
VA (value added)	16512.483	246537.475	0.08	62256880
L (n. of workers)	181.285	848.103	10	84660
K (capital)	29178.223	232189.292	0.742	30278974
grossprofit (gross profit)	5625.22	205832.466	-1076930	53930804
gtxk (exports)	121066.863	5965574.951	0	1341736960
gtnk (imports)	95108.969	4025111.438	0	608279808
ck (capital cost)	2975.845	23662.82	0.085	3380362.5
sl (labor share)	0.788	0.174	0.004	1
sk (capital share)	0.212	0.174	0	0.996
wpe (wage/labor)	36.847	27.57	0.033	1293.846
intcap (capital/labor)	153.983	391.409	0.004	23253.098
alp (VA/labor)	73.832	1159.53	0.008	251675.172
akp (K/Labor)	4.004	55.159	0	10165.5
intexp (Exports/turnover)	1.583	71.226	0	14857.947
vaps (VA/turnover)	0.269	0.214	0	1
ppe (profit/labor)	20.284	1157.902	-4563.588	251619.203
spe (turnover/labor)	593.049	4165.034	0.117	757321.313
N (number of observations)		89285		

Table D3. Summary statistics 3 (after trimming bottom and top 1%)

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min.</b>	<b>Max.</b>
W (wage)	6272.481	19562.64	23.002	425596.219
sales (turnover)	70613.601	260535.374	82.263	6308413.5
q2 (value added)	11525.435	40787.881	12.519	1137529.625
L (n. of workers)	156.179	450.117	10	9320
K (capital)	20027.229	85298.865	3.489	2656658.5
grossprofit (gross profit)	2934.07	20415.11	-76559.516	621507.5
gtxk (exports)	30754.011	194646.086	0	9562704
gtnk (imports)	27286.405	193706.179	0	8353935.5
ck (capital cost)	2090.95	8498.376	0.830	251583.031
sl (labor share)	0.79	0.17	0.082	0.999
sk (capital share)	0.21	0.17	0.001	0.918
wpe (wage/labor)	36.255	23.366	1.12	293.143
intcap (capital/labor)	140.383	259.514	0.098	5063.466
alp (VA/labor)	63.66	82.304	0.41	1392.889
akp (capital/labor)	2.807	11.98	0.003	386.082
intexp (exports/turnover)	0.306	3.749	0	301.631
vaps (VA/turnover)	0.268	0.212	0.002	0.991
ppe (profit/labor)	12.077	58.352	-236.6	1131.979
spe (sales/labor)	511.769	1055.246	3.639	21076.51
N (number of observations)			87614	

Table D4. Summary statistics 4 (2000, 2010-2013)

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min.</b>	<b>Max.</b>	<b>N</b>
lnq1 (turnover)	9.318	1.828	4.41	15.657	87614
lnq2 (value added)	7.643	1.671	2.528	13.944	87614
lnL (n. of workers)	3.888	1.312	2.304	9.140	87614
lnK (capital)	7.915	1.971	1.253	14.793	87614
lnw (wage)	7.295	1.538	3.136	12.961	87614
lexport (export)	-0.975	6.346	-4.605	16.073	87614
lnprofit (gross profit)	4.673	3.474	-4.605	13.34	65408
lnintcap (K/L)	4.029	1.502	-2.225	8.529	87614
lnwpe (wage/labor)	3.408	0.643	0.122	5.681	87614
lnalp (VA/L)	3.756	0.871	-0.867	7.239	87614
lnakp (K/L)	-0.243	1.334	-4.307	5.956	87614
lintexp (exports/turnover)	-3.665	1.783	-4.605	5.709	87614
lnvaps (VA/turnover)	-1.592	0.849	-4.464	0.001	87614
lnppe (profit/labor)	0.988	2.367	-6.683	7.032	65437

Table D5. Summary statistics 5 (2010-2013)

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min.</b>	<b>Max.</b>	<b>N</b>
lnq1 (turnover)	9.335	1.813	4.41	15.657	81781
lnq2 (value added)	7.665	1.652	2.528	13.944	81781
lnL (n. of workers)	3.862	1.301	2.304	9.140	81781
lnK (capital)	7.916	1.971	1.253	14.793	81781
lnw (wage)	7.326	1.516	3.136	12.961	81781
lexport (export)	-1.037	6.317	-4.605	16.073	81781
lnprofit (gross profit)	4.642	3.527	-4.605	13.34	60852
lnTFP (TFP)	0.02	1.652	-5.126	6.238	81781
lnintcap (K/L)	4.055	1.506	-2.225	8.529	81781
lnwpe (wage/labor)	3.464	0.595	0.122	5.681	81781
lnalp (VA/L)	3.803	0.838	-0.811	7.239	81781
lnakp (K/L)	-0.223	1.342	-4.307	5.956	81781
lintexp (export/turnover)	-3.688	1.764	-4.605	5.709	81781
lnvaps (VA/turnover)	-1.588	0.848	-4.464	0.001	81781
lnppe (profit/labor)	0.99	2.397	-6.683	7.032	60881

## E Kernel distribution

Figure E1. Kernel density by sector: VA/Turnover

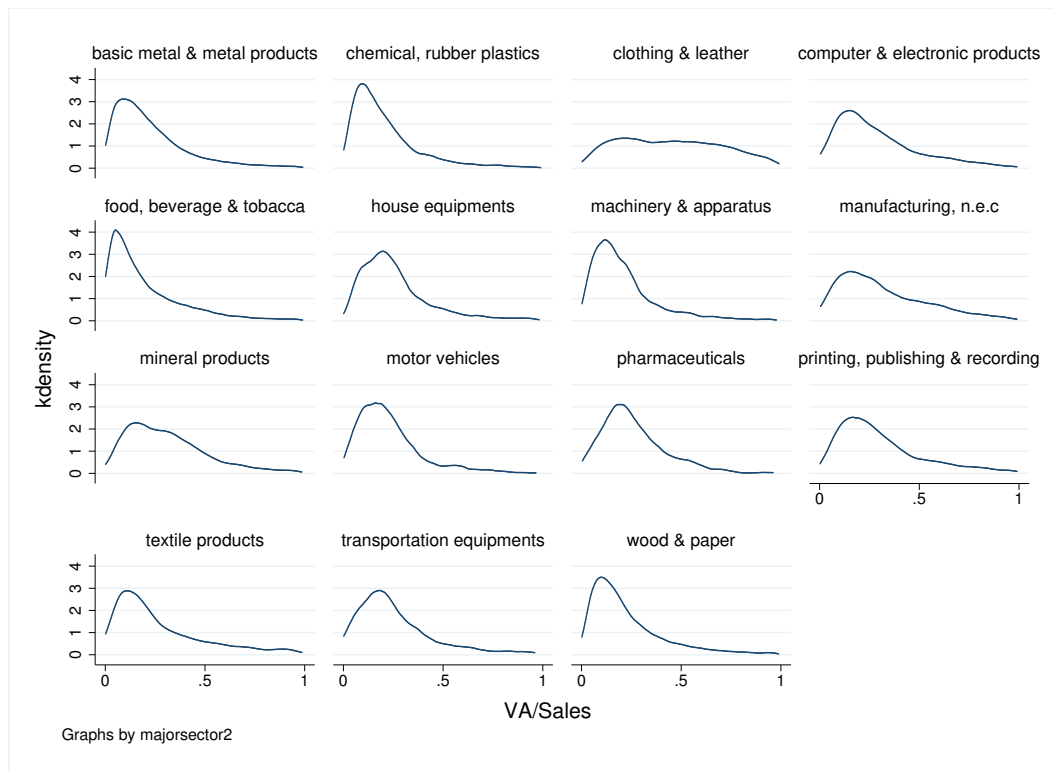


Figure E2. Kernel density by sector: VA/Turnover (non-exporting firms)

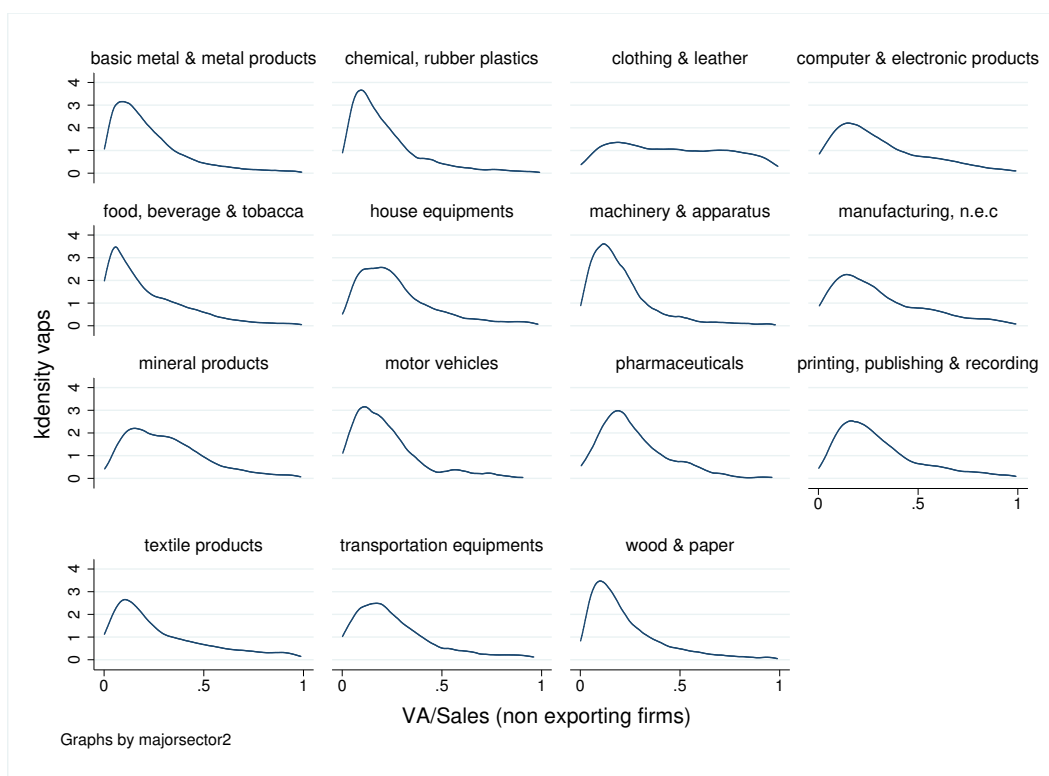


Figure E3. Kernel density by sector: VA/Turnover (processing exporters)

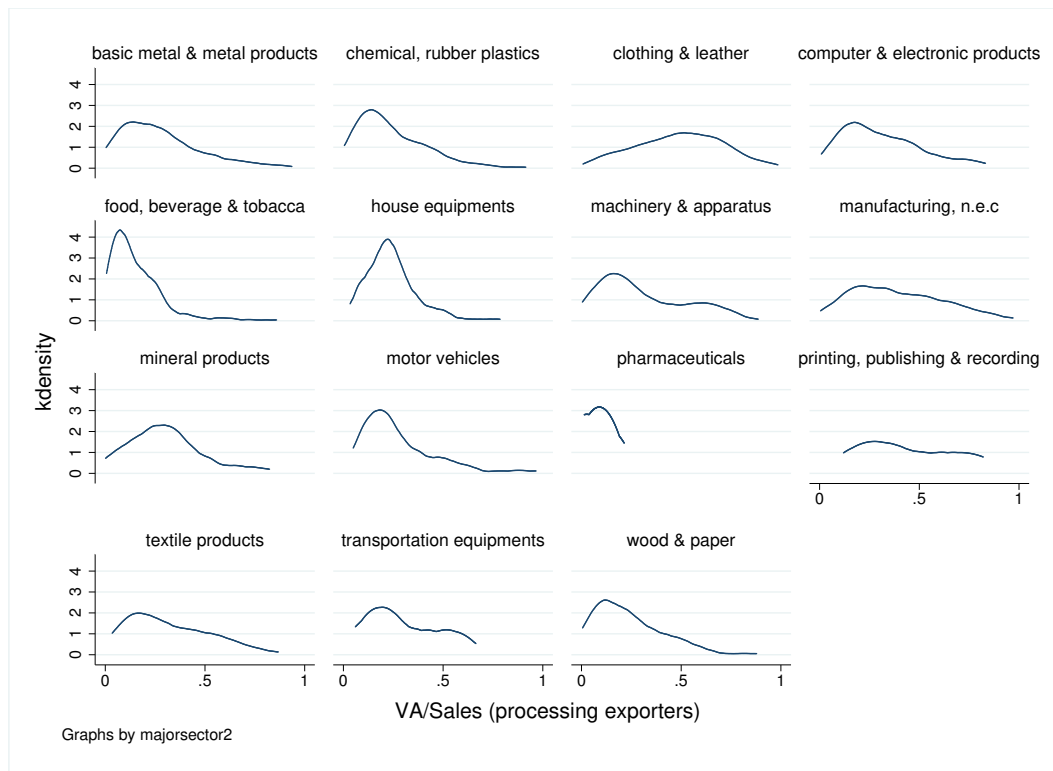


Figure E4. Kernel density by sector: VA/Turnover (non processing exporters)

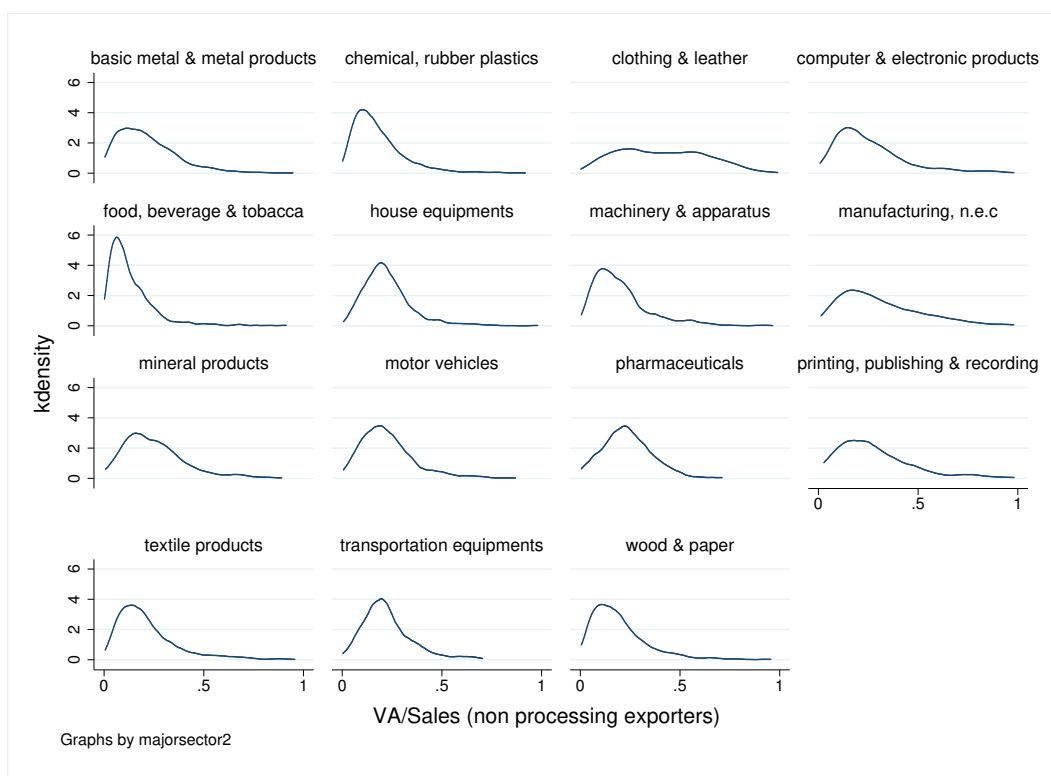




Figure E5. Kernel density by sector: Capital/Labor (in log)

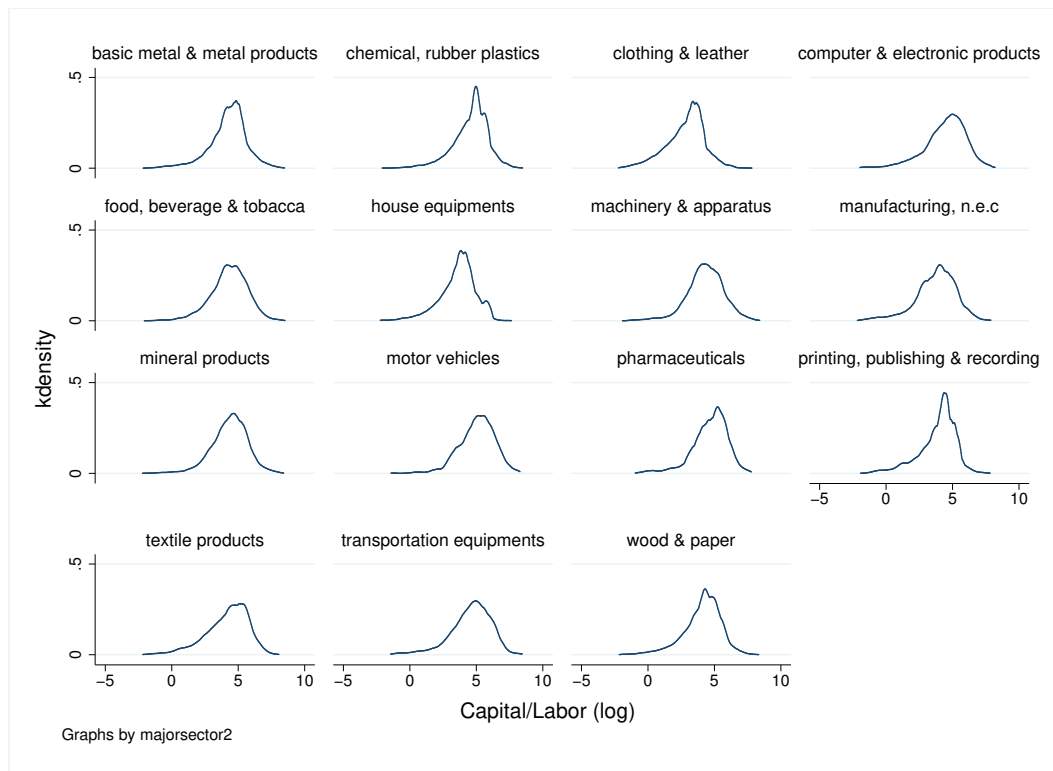


Figure E6. Kernel density by sector: Profit/Labor (in log)

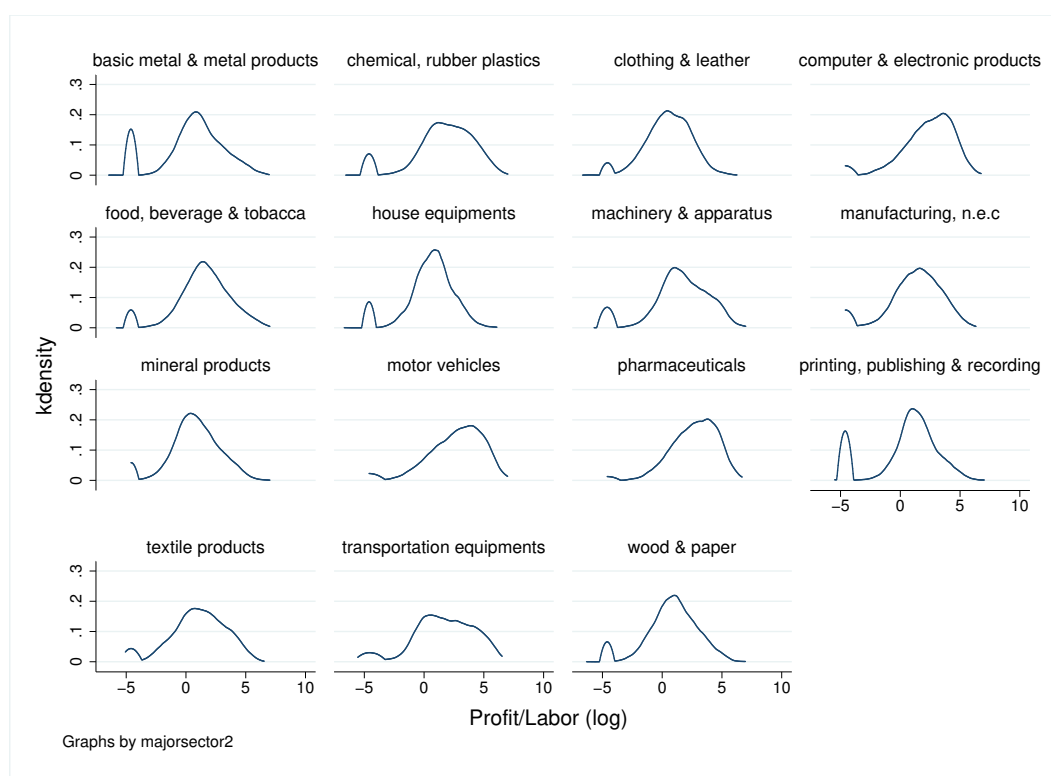


Figure E7. Kernel density by sector: VA/Labor (in log)

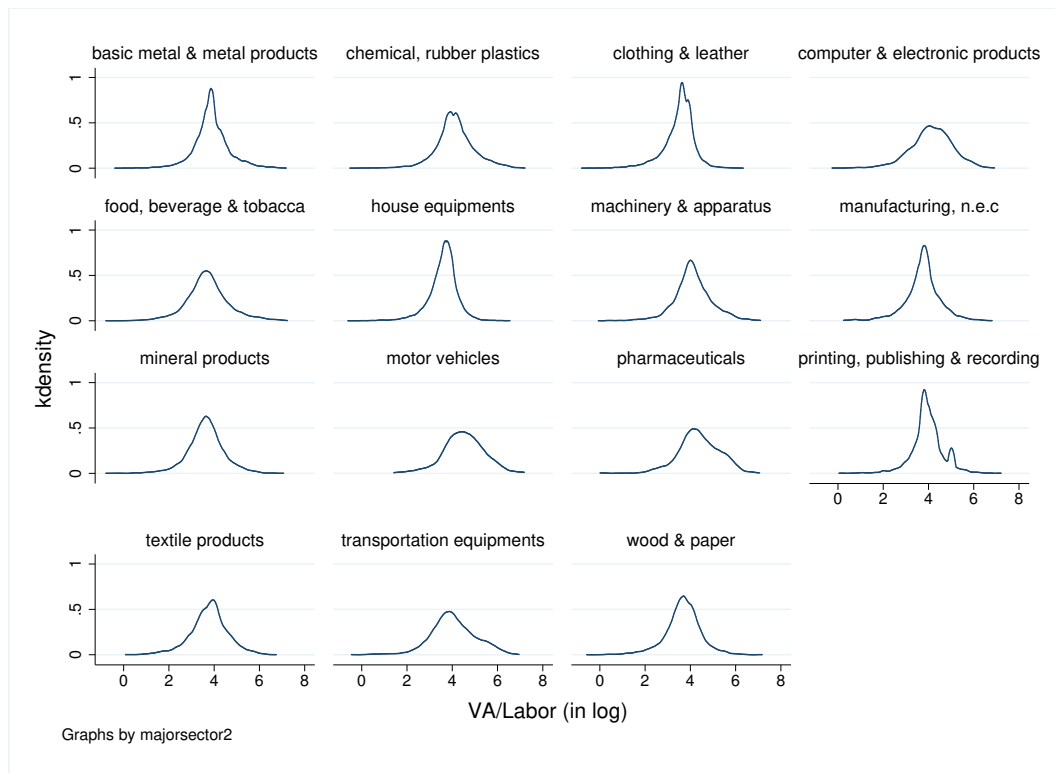


Figure E8. Kernel density by sector: Turnover/Labor (in log)

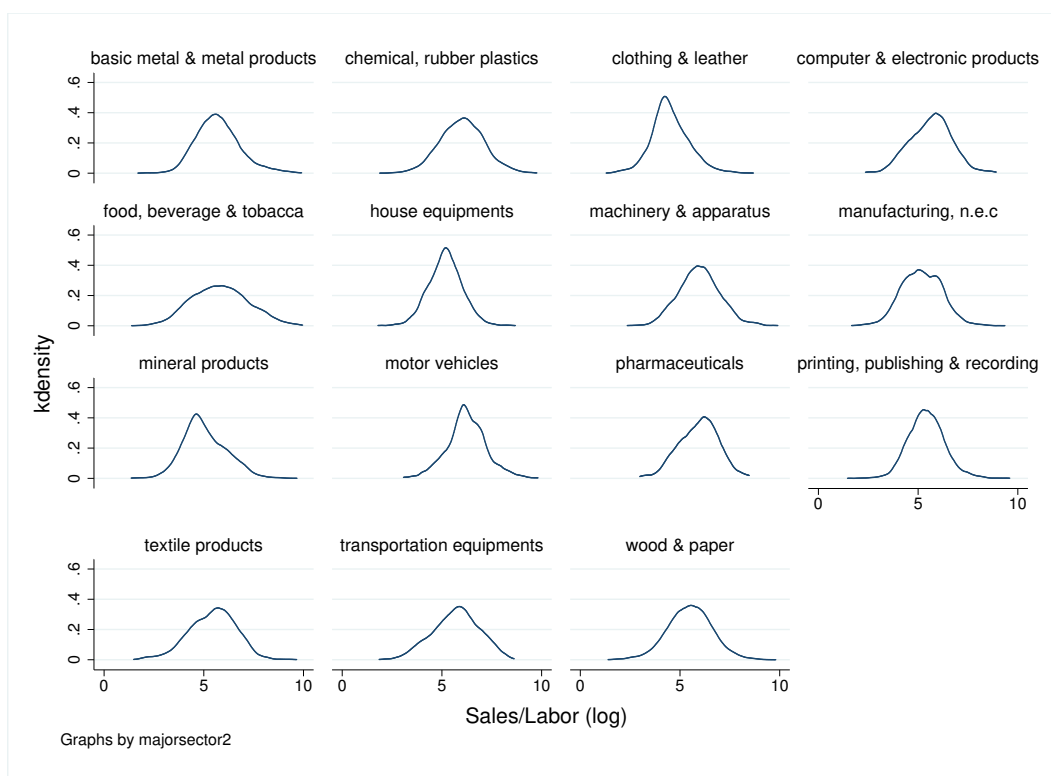


Figure E9. Kernel density by sector: TFP (in log)

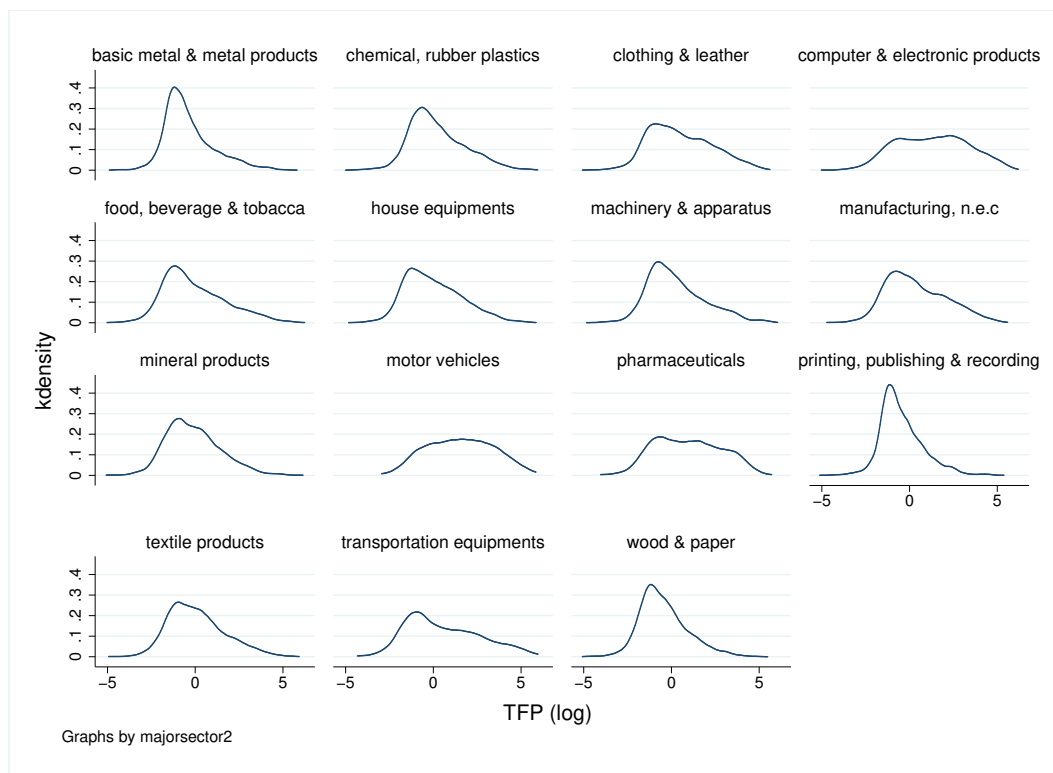
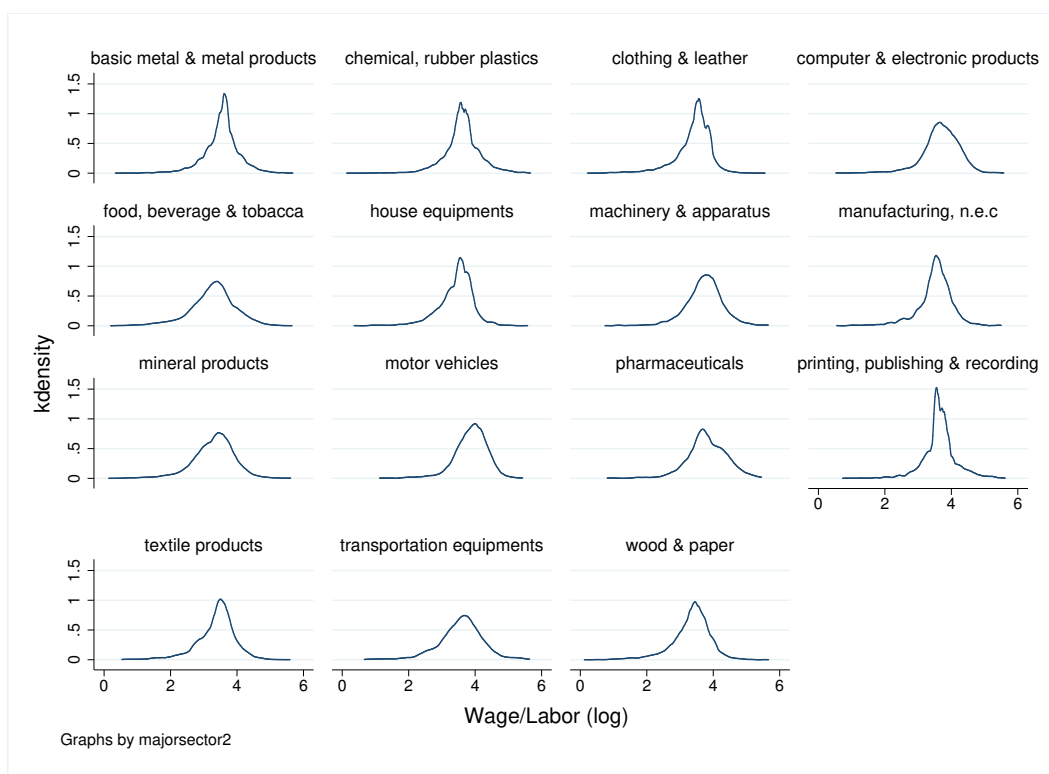


Figure E10. Kernel density by sector: Wage/Labor (in log)



## F Alternative regression results

Table F1. Robustness check in terms of Export intensity values

(Dependent variable: labor productivity)

<b>Variables/regression methods</b>	<b>Between<sup>1</sup></b>	<b>WLS<sup>2</sup></b>	<b>RE(ML)<sup>3</sup></b>
Ordinary exporters	0.212*** (0.0135)	0.175*** (0.00841)	0.119*** (0.00856)
Processing exporters	-0.450*** (0.0272)	-0.129*** (0.0152)	-0.0271* (0.0145)
Foreign owned dummy	0.376*** (0.0128)	0.358*** (0.0103)	0.391*** (0.0117)
Labor	0.0764*** (0.00370)	0.0625*** (0.00266)	0.0312*** (0.00331)
Capital intensity	0.226*** (0.00273)	0.199*** (0.00178)	0.197*** (0.00203)
Constant	1.317** (0.535)	3.289*** (0.719)	2.446*** (0.0279)
Observations	96,366	96,366	96,366
R-squared	0.330	0.244	
Number of id	41,036		41,036

<sup>1</sup> Between regression (regression on group means)      <sup>2</sup> Weight least squares regression

<sup>3</sup> Random-effects Maximum likelihood regression      Standard errors in parentheses (\*\*\*)  
p<0.01, \*\* p<0.05, \* p<0.1)

All values are net of industry, year and cohort and specific effects.

Source: Own calculation

Table F2. Robustness check in terms of Export intensity values  
(Dependent variable: capital productivity)

<b>Variables/regression methods</b>	<b>Between<sup>1</sup></b>	<b>WLS<sup>2</sup></b>	<b>RE(ML)<sup>3</sup></b>
Ordinary exporters	0.207*** (0.0130)	0.172*** (0.00813)	0.117*** (0.00813)
Processing exporters	-0.436*** (0.0263)	-0.129*** (0.0146)	-0.0221 (0.0137)
Foreign owned dummy	0.375*** (0.0123)	0.357*** (0.00988)	0.391*** (0.0112)
Labor	0.0748*** (0.00357)	0.0640*** (0.00256)	0.0283*** (0.00318)
Capital intensity	-0.761*** (0.00264)	-0.782*** (0.00176)	-0.792*** (0.00194)
Constant	1.355*** (0.516)	1.467** (0.656)	2.453*** (0.0267)
Observations	96,366	96,366	96,366
R-squared	0.708	1.000	
Number of id	41,036		41,036

<sup>1</sup> Between regression (regression on group means)      <sup>2</sup> Weight least squares regression

<sup>3</sup> Random-effects Maximum likelihood regression      Standard errors in parentheses (\*\*\*)  
p<0.01, \*\* p<0.05, \* p<0.1)

All values are net of industry, year and cohort and specific effects.

Source: Own calculation



Table F3. Robustness check in terms of Export intensity values  
(Dependent variable: total factor productivity)

<b>Variables/regression methods</b>	<b>Between<sup>1</sup></b>	<b>WLS<sup>2</sup></b>	<b>RE(ML)<sup>3</sup></b>
Ordinary exporters	0.212*** (0.0135)	0.175*** (0.00842)	0.119*** (0.00857)
Processing exporters	-0.450*** (0.0273)	-0.130*** (0.0152)	-0.0272* (0.0145)
Foreign owned dummy	0.376*** (0.0128)	0.358*** (0.0103)	0.391*** (0.0117)
Labor	1.077*** (0.00370)	1.063*** (0.00266)	1.031*** (0.00331)
Capital intensity	0.226*** (0.00274)	0.199*** (0.00178)	0.197*** (0.00204)
Constant	-6.278*** (0.535)	-4.276*** (0.719)	-5.232*** (0.0279)
Observations	96,366	96,366	96,366
R-squared	0.826	0.899	
Number of id	41,036		41,036

<sup>1</sup> Between regression (regression on group means)      <sup>2</sup> Weight least squares regression

<sup>3</sup> Random-effects Maximum likelihood regression      Standard errors in parentheses

(\*\*\* p<0.01, \*\* p<0.05, \* p<0.1)

All values are net of industry, year and cohort and specific effects.

Source: Own calculation

Table F4. Robustness check in terms of Export intensity values  
(Dependent variable: wage per worker)

<b>Variables/regression methods</b>	<b>Between<sup>1</sup></b>	<b>WLS<sup>2</sup></b>	<b>RE(ML)<sup>3</sup></b>
Ordinary exporters	0.163*** (0.00920)	0.133*** (0.00547)	0.117*** (0.00600)
Processing exporters	-0.145*** (0.0185)	-0.00178 (0.00999)	0.0573*** (0.0102)
Foreign owned dummy	0.249*** (0.00869)	0.265*** (0.00604)	0.263*** (0.00806)
Labor	0.0482*** (0.00252)	0.0319*** (0.00180)	0.00882*** (0.00229)
Capital intensity	0.0892*** (0.00186)	0.0939*** (0.00133)	0.0922*** (0.00141)
Constant	2.887*** (0.364)	3.592*** (0.209)	3.049*** (0.0192)
Observations	96,366	96,366	96,366
R-squared	0.259	0.294	
Number of id	41,036		41,036

<sup>1</sup> Between regression (regression on group means)

<sup>2</sup> Weight least squares regression

<sup>3</sup> Random-effects Maximum likelihood regression Standard errors in parentheses (\*\*\*)  
p<0.01, \*\* p<0.05, \* p<0.1)

All values are net of industry, year and cohort and specific effects.

Source: Own calculation

Table F5. Robustness check in terms of NTZ  
(Dependent variable: labor productivity)

<b>Variables/regression methods</b>	<b>Between<sup>1</sup></b>	<b>WLS<sup>2</sup></b>	<b>RE(ML)<sup>3</sup></b>
Export status dummy	0.156*** (0.0131)	0.148*** (0.00821)	0.109*** (0.00843)
NTZ dummy	-0.377*** (0.0198)	-0.263*** (0.0150)	-0.160*** (0.0178)
Foreign owned dummy	0.415*** (0.0132)	0.396*** (0.0107)	0.410*** (0.0120)
Labor	0.0780*** (0.00372)	0.0651*** (0.00267)	0.0332*** (0.00332)
Capital intensity	0.231*** (0.00274)	0.201*** (0.00178)	0.198*** (0.00204)
Constant	1.303** (0.536)	1.425** (0.707)	2.437*** (0.0279)
Observations	96,366	96,366	96,366
R-squared	0.327	0.244	
Number of id	41,036		41,036

<sup>1</sup> Between regression (regression on group means)      <sup>2</sup> Weight least squares regression

<sup>3</sup> Random-effects Maximum likelihood regression      Standard errors in parentheses (\*\*\*)  
p<0.01, \*\* p<0.05, \* p<0.1)

All values are net of industry, year and cohort and specific effects.

Source: Own calculation

Table F6. Robustness check in terms of NTZ  
(Dependent variable: capital productivity)

<b>Variables/regression methods</b>	<b>Between<sup>1</sup></b>	<b>WLS<sup>2</sup></b>	<b>RE(ML)<sup>3</sup></b>
Export status dummy	0.152*** (0.0126)	0.147*** (0.00794)	0.107*** (0.00801)
NTZ dummy	-0.367*** (0.0191)	-0.259*** (0.0143)	-0.151*** (0.0170)
Foreign owned dummy	0.413*** (0.0127)	0.393*** (0.0103)	0.408*** (0.0115)
Labor	0.0763*** (0.00359)	0.0665*** (0.00257)	0.0302*** (0.00319)
Capital intensity	-0.757*** (0.00264)	-0.780*** (0.00176)	-0.791*** (0.00194)
Constant	1.341*** (0.517)	3.203*** (0.694)	2.444*** (0.0267)
Observations	96,366	96,366	96,366
R-squared	0.706	0.962	41,036
Number of id	41,036		

<sup>1</sup> Between regression (regression on group means)      <sup>2</sup> Weight least squares regression

<sup>3</sup> Random-effects Maximum likelihood regression      Standard errors in parentheses (\*\*\*)  
p<0.01, \*\* p<0.05, \* p<0.1)

All values are net of industry, year and cohort and specific effects.

Source: Own calculation

Table F7. Robustness check in terms of NTZ  
(Dependent variable: total factor productivity)

<b>Variables/regression methods</b>	<b>Between<sup>1</sup></b>	<b>WLS<sup>2</sup></b>	<b>RE(ML)<sup>3</sup></b>
Export status dummy	0.156*** (0.0131)	0.148*** (0.00822)	0.108*** (0.00844)
NTZ dummy	-0.377*** (0.0198)	-0.263*** (0.0150)	-0.160*** (0.0178)
Foreign owned dummy	0.415*** (0.0132)	0.396*** (0.0107)	0.410*** (0.0120)
Labor	1.078*** (0.00372)	1.065*** (0.00267)	1.033*** (0.00333)
Capital intensity	0.231*** (0.00274)	0.201*** (0.00179)	0.198*** (0.00204)
Constant	-6.292*** (0.537)	-4.292*** (0.720)	-5.242*** (0.0279)
Observations	96,366	96,366	96,366
R-squared	0.825	0.899	
Number of id	41,036		41,036

<sup>1</sup> Between regression (regression on group means)      <sup>2</sup> Weight least squares regression

<sup>3</sup> Random-effects Maximum likelihood regression      Standard errors in parentheses

(\*\*\* p<0.01, \*\* p<0.05, \* p<0.1)

All values are net of industry, year and cohort and specific effects.

Source: Own calculation

Table F8. Robustness check in terms of NTZ  
(Dependent variable: wage per worker)

<b>Variables/regression methods</b>	<b>Between<sup>1</sup></b>	<b>WLS<sup>2</sup></b>	<b>RE(ML)<sup>3</sup></b>
Export status dummy	0.136*** (0.00889)	0.127*** (0.00540)	0.113*** (0.00590)
NTZ dummy	-0.173*** (0.0135)	-0.123*** (0.00852)	-0.0704*** (0.0123)
Foreign owned dummy	0.267*** (0.00895)	0.281*** (0.00627)	0.271*** (0.00825)
Labor	0.0489*** (0.00253)	0.0328*** (0.00180)	0.00973*** (0.00230)
Capital intensity	0.0912*** (0.00186)	0.0951*** (0.00134)	0.0926*** (0.00141)
Constant	2.881*** (0.365)	3.588*** (0.209)	3.045*** (0.0192)
Observations	96,366	96,366	96,366
R-squared	0.257	0.295	
Number of id	41,036		41,036

<sup>1</sup> Between regression (regression on group means)

<sup>2</sup> Weight least squares regression

<sup>3</sup> Random-effects Maximum likelihood regression Standard errors in parentheses (\*\*\*)  
p<0.01, \*\* p<0.05, \* p<0.1)

All values are net of industry, year and cohort and specific effects.

Source: Own calculation



# General Conclusion

In this dissertation, FDI was approached from both a macroeconomic and a microeconomic viewpoints. At the macro level, we question the role of ODA as an engine to promote FDI in developing countries. Meanwhile, at the micro level, we study the behavior of foreign firms in a small emerging economy like Vietnam. In this field, we focus on two issues. First, we investigate the relationship between foreign ownership and corporate performance. Second, we emphasize the study on firm heterogeneity in terms of trade activity distinguishing processing and ordinary trade, and in terms of ownership discriminating domestic and foreign-owned firms.

The macro panel data consisted of 32 developing countries running from 2003 to 2010. The ODA data were taken from the database of the Organisation for Economic Co-operation and Development (OECD) while the FDI data were taken from the database of International Trade Centre (ITC). The other control variables data such as GDP, population, gross domestic savings...were compiled from the database of World Bank (WB) or the International Monetary Fund (IMF). At the same time, the dataset used for micro empirical studies were obtained from the annual surveys of the enterprises operating in Vietnam conducted by the General Statistic Office of Vietnam from 2000 to 2013. These are comprehensive surveys covering all state enterprises, non-state enterprises which have equal or greater than 10 employees, 20% of sampled non-state enterprises with fewer than 10



employees and all registered foreign enterprises in Vietnam. The surveys include relevant accounting information to reflect the production situation of enterprises such as employees, wage, capital source, turnover, profit, investment capital, taxes and other obligations to the government...and information allowed to identify the ownership and the type of trade firms are involved in. This information is relatively valuable to examine the firm's behavior at the micro level data.

The main purpose of the first chapter was to shed light on the nature of the relationship (complementarity or substitution) between ODA and FDI. To achieve this goal, we examined the effects of ODA on FDI both at the aggregate level and cross-sectoral level, distinguishing complementary inputs sectors and physical capital sectors. At first, our statistical analyses state that on the one hand, FDI is the major external financing source for developing countries; on the other hand, the most attractive recipients of FDI and ODA are new Asian emerging countries, in which, Vietnam is considered as the typical case. Concerning the empirical evidence, the aggregated results reveal that the substitutable effect of ODA on FDI dominates its complementary effect. Meanwhile, the disaggregated results show that ODA in complementary inputs complements well FDI in physical capital but at the same time, ODA in physical capital tend to crowd out FDI in the same stand even though there is not enough evidence to confirm this relationship is a perfect crowding out effect one by one. We also find that FDI in complementary inputs behave like their counterpart ODA, meaning they are able to complement FDI in physical capital.

The second chapter examined differences in corporate performance between foreign and domestic owned firms in Vietnam. Our working assumption is that foreign firms perform better than domestic firms and achieve faster growth. We also test the assumption that potentially profitable firms are more likely to become MNCs and that these ones tend to survive better than Vietnamese domestic firms. By using a large dataset of about 195,000

manufacturing firms over the period 2000-2013 and relying on the dynamic analytical framework developed by Roberts and Tybout (1997), Bernard and Jensen (1999), we constructed the (probit) models with random effects to solve the issues. The empirical findings are as follow. First, foreign firms outperform domestic firms with regard to productivity but underperform these ones in terms of profitability. Second, foreign firms grow faster than domestic firms according to all margins of performance. However, they become less profitable than domestic counterparts if the effects of firms size and R&D are controlled for. Third, foreign firms seem to survive better than domestic firms on the Vietnamese market. Finally, we explore a possible reason for the low profitability of foreign firms that may be due to the phenomenon transfer-mispricing. We also reveal that the substantial sunk cost for foreign firms to enter the Vietnamese market exist across sectors and years.

The last chapter aimed to investigate firms' export behavior in Vietnam. Based on a sample that consists of 24000 manufacturing exporters on average over the period 2010-2013 along with 6300 manufacturing exporters in 2000 as the reference year, we sought to check at the beginning the pattern of Vietnamese exporting firms. We found that the distribution of export intensities in Vietnam holds the U-shaped pattern like the one of other emerging economies that engage strongly in global value chains. At the second stage, we examine the export premia discriminating ordinary and export processing exporters. To do this, we use both non-parametric as well as parametric measures. By contrast to the large part of previous findings in the literature, our empirical evidence argues that processing firms are less productive and pay lower wages than non-processing firms, even than non-exporting firms. This anomalous pattern is more obvious among foreign firms and firms operating in the non-tariff zone. This finding at least is in line with findings for China (Lu (2010), Lu et al. (2010), Dai et al. (2016)) and other countries largely involved in GVC.

This dissertation has brought selected insights and contributions to the debate on FDI and international trade. First, to the best of our knowledge, our studies are the earliest researches to examine, in a systematic way, FDI at the disaggregated level both with the help of a theoretical model at the sectorally disaggregated level and with the help of the micro panel data on Vietnam. Second, the dissertation opens up new aspects in the investigation of FDI which allow better understanding its characteristics and its behavior relative to other sources of growth in developing and transitioning economies. Particularly, in the first essay, we demonstrate that only attracting ODA in complementary inputs can help host countries to improve simultaneously the conditions of social infrastructure and FDI inflows. In the second essay, by comparing the performance of foreign and domestic owned firms in Vietnam both in static and dynamic aspects, we showed that the current profitability does not matter in the decision of foreign investors and foreign-owned firms are not necessary larger, more profitable and more R&D intensive than domestic firms as suggested in the previous literature. Finally, the most striking feature can be drawn from the last essay where we provide evidence that exporters under-perform non-exporters due to the presence of processing exporters. This finding is opposite to the suggestion in the Melitz (2003) model emphasizing that a move towards exporting can improve the aggregate productivity of the sector because exporters are normally considered more productive than non-exporters. Third, our studies contribute to enriching empirical researches on FDI in developing and small economies. Indeed, the boom of FDI flows to developing countries has only started since the 1990s, especially after the financial crises in Asia and Latin America between 1995 and 2002 which have improved developing and newly industrializing countries to rely primarily on foreign direct investment (FDI), in order to supplement national savings by capital inflows and promote economic development.

Based on the above considerations, three important sets of policy implications are proposed. Firstly, our findings on the relationship between ODA and FDI recommend that

host countries should improve ODA in complementary sectors instead of ODA in physical capital sectors because ODA in complementary sectors not only help to enhance social infrastructures of host countries but also support the accumulation and the efficiency of inward FDI flows towards these countries. Meanwhile, once ODA finances physical capital sectors, they will crowd out FDI. The total benefits brought by them will be therefore weakened. Secondly, results of the second chapter suggest that Vietnamese officials must take notice of two major concerns that are transfer mispricing of MNCs and sunk costs. Concerning sunk costs, the government should improve transparency of regulation information especially in the tax system, land, and administrative procedures to ensure that all economic actors have the same chance to access necessary information, therefore reducing corruptions and sunk costs. Concerning the transfer mispricing, it is important to harmonize Vietnam's tax policies with international competitors in order to reduce profit shifting. Besides, policy-makers should ensure firms a predictable tax schedule in the future, so that they are accordingly able to estimate their future burden. Then, instead of profit-shifting, foreign firms will be more likely to find keeping vital revenue in Vietnam that can be used to offset the public services and infrastructure that are considered the most important strategic disadvantages of the Vietnamese investment climate. Finally, based on findings in the third chapter, we propose that in the presence of processing trade, the reallocation of resources towards exporting firms might not induce large aggregate productivity gains as processing firms are the less productive ones. However, less productive firms could benefit dynamically from their participation in global value chains since there could be knowledge spillover and/or learning by doing from processing. Therefore, the cost, as well as benefits of export processing, should be critically revolved by countries conducting processing trade or planning to do so.

To conclude, this dissertation opens new avenues for further research perspectives on FDI at several levels. In the first chapter, due to the limitation of the dataset, we were able to investigate only a panel of 32 developing countries over 8 years. The small size of

the sample can lead to bias in our conclusions about the effects of explanatory variables. Therefore, in the future research, we will enrich our dataset in order to increase the cross time variance in the set of time-varying variables and ensure the confidence of empirical results. Next, we would like to develop the second research by focusing on the determinants of the ownership entry mode choices and their effects on the corporate performance. Basically, entry-mode theory assumes that firms will select the mode that provides the best return on investment. At the meantime, transaction cost theory maintains that the costs of finding, negotiating and monitoring the actions of potential partners influence entry mode choice. Therefore, modes selected based on the transaction cost model provide firms with the most efficient structure. The most noticeable studies in this field are Hill et al. (1990), Woodcock et al. (1994), Brouthers (2002)...Finally, we intend to further investigate the robustness of our new stylized facts about Vietnam by an alternative measurement of productivity. According to Ha and Kiyota (2014), regression results may be biased due to the productivity measurement. Since in our work, the data cover both large and small firms, the firm size may affect the reference firm, which is built from the arithmetic means overall firms. To solve this issue, instead of computing TFP by using mean reference firm, we can rely on the median reference firm to compute it. Moreover, following Lu et al. (2010), we want to link this new evidence to micro-oriented models to better understand firm internationalization strategies and performances. On the next step, we intend to investigate further the link between these new evidence and macro-oriented models in order to understand better the contribution of foreign-owned firms to productivity growth in an emerging economy.

## Conclusion Générale

Dans cette dissertation, l'IDE a été approché à la fois d'un point de vue macroéconomique et d'un point de vue microéconomique. Au niveau macro, nous nous sommes interrogés sur le rôle de l'APD en tant que moteur pour promouvoir l'IDE dans les pays en développement. Au niveau micro-économique, nous avons étudié le comportement des entreprises étrangères dans une petite économie émergente comme le Vietnam. Dans ce champ, nous nous sommes concentrés sur deux questions. Premièrement, nous avons étudié la relation entre la propriété étrangère et la performance de l'entreprise. Deuxièmement, nous avons étudié l'hétérogénéité des entreprises en termes d'activité commerciale distinguant le commerce de transformation et le commerce ordinaire, et en termes de propriété discriminant les entreprises purement domestiques et les entreprises détenues par des capitaux étrangers.

Les macro-données de panel ont été constituées de 32 pays en développement, de 2003 à 2010. Les données sur l'APD ont été extraites de la base de données de l'Organisation de coopération et de développement économiques (OCDE), tandis que les données sur l'IDE sont provenus de la base de données du Centre du commerce international (CCI). Les autres données de variables de contrôle telles que le PIB, la population, l'épargne intérieure brute ... ont été compilées à partir de la base de données de la Banque mondiale (BM) ou du Fonds monétaire international (FMI). Parallèlement, les données utilisées pour les études micro-économétriques ont été obtenues à partir des enquêtes annuelles des entreprises opérant au

Vietnam menées par l'Office général de la statistique du Vietnam de 2000 à 2013. Ce sont des enquêtes exhaustives couvrant toutes les entreprises publiques, non étatiques qui possèdent un effectif égal ou supérieur à 10 employés, 20% des entreprises non étatiques échantillonnées comptant moins de 10 employés et toutes les entreprises étrangères enregistrées au Vietnam. Ces enquêtes incluent des informations comptables pertinentes pour refléter la situation de production des entreprises telles que les employés, le salaire, la source de capital, le chiffre d'affaires, le bénéfice, le capital d'investissement, les impôts et autres obligations envers le gouvernement ... et l'information permettant d'identifier la propriété et le type de commerce dans lequel les entreprises sont impliquées.

L'objectif principal du premier chapitre a été de faire la lumière sur la nature de la relation (complémentarité ou substitution) entre l'APD et l'IDE. Pour atteindre cet objectif, nous avons examiné les effets de l'APD sur l'IDE tant au niveau agrégé qu'au niveau sectoriel, en distinguant les secteurs des intrants complémentaires et les secteurs du capital physique. D'abord, nos analyses statistiques indiquent que, d'une part, l'IDE est la source majeure de financement externe pour les pays en développement; d'autre part, les bénéficiaires les plus attractifs de l'IDE et de l'APD sont de nouveaux pays émergents d'Asie, parmi lesquels le Vietnam est considéré comme le cas typique. En ce qui concerne les preuves empiriques, les résultats agrégés révèlent que l'effet substituable de l'APD sur l'IDE domine son effet complémentaire. En même temps, les résultats désagrégés montrent que l'APD dans les intrants complémentaires complète bien l'IDE dans le capital physique, mais l'APD dans le capital physique a tendance à évincer l'IDE de même type même s'il n'y a pas assez de preuves pour confirmer que cette relation est un effet évinçant parfait de un pour un. Nous constatons également que l'IDE dans les intrants complémentaires se comporte comme leur APD homologue, ce qui signifie qu'ils sont en mesure de compléter l'IDE dans le capital physique.

Le deuxième chapitre a examiné les différences de performance entre les entreprises en possession étrangère et les entreprises purement domestiques au Vietnam. Notre hypothèse de travail est que les entreprises étrangères sont plus performantes que les entreprises domestiques et réalisent une croissance plus rapide que celles-ci. Nous testons également la supposition selon laquelle les entreprises potentiellement rentables sont davantage susceptibles de devenir des multinationales et elles ont tendance à survivre mieux que les entreprises domestiques vietnamiennes. En utilisant une grande base de données d'environ 195,000 entreprises manufacturières sur la période 2000-2013 et en nous appuyant sur le cadre analytique dynamique développé par Roberts and Tybout (1997), Bernard and Jensen (1999), nous avons construit des modèles économétriques (des probit) avec des effets aléatoires pour résoudre les questions concernées. Les résultats empiriques sont les suivants. Premièrement, les entreprises étrangères surpassent les entreprises domestiques en termes de productivité, mais elles deviennent moins performantes que ces dernières en termes de rentabilité. Deuxièmement, les entreprises étrangères s'accroissent plus rapidement que les entreprises domestiques correspondant à toutes les marges de performance. Cependant, elles deviennent moins rentables que leurs homologues domestiques si l'on tient compte des effets de la taille des entreprises et de la R&D. Troisièmement, les entreprises étrangères semblent survivre mieux que les entreprises domestiques sur le marché vietnamien. Une interprétation plausible de nos résultats est que la faible rentabilité des entreprises étrangères est due au phénomène de prix de transfert erronés. Nous montrons aussi qu'il existe des coûts irréversibles substantiels pour les entreprises étrangères qui veulent entrer au marché vietnamien quel que soit le secteur ou l'année.

Le dernier chapitre a visé à étudier le comportement des entreprises exportatrices au Vietnam. Sur la base d'un échantillon composé de 24,000 exportateurs manufacturiers en moyenne sur la période 2010-2013 et de 6,300 exportateurs manufacturiers en 2000 comme année de référence, nous avons cherché à caractériser le profil des entreprises export-



atrices vietnamiennes. Premièrement, nous avons constaté que la distributions des intensités d'exportation des entreprises opérant au Vietnam a une forme en U comme celui d'autres économies émergentes fortement engagées dans les chaînes de valeur mondiales. Ensuite, nous avons examiné les primes à l'exportation discriminant les exportateurs ordinaires et les exportateurs de transformation. Pour cela, nous avons utilisé à la fois des mesures non-paramétriques et des mesures paramétriques. Contrairement à la grande partie des résultats antérieurs dans la littérature, nos évidences empiriques soutiennent que les entreprises de transformation sont moins productives et paient des salaires inférieurs que les entreprises non transformatrices, voire des entreprises non exportatrices. Ce modèle anormal est plus évident parmi les entreprises étrangères et les entreprises opérant au sein des zones non tarifaires. Cette découverte est au moins conforme aux résultats trouvés pour la Chine (Lu (2010), Lu et al. (2010), Dai et al. (2016)) et d'autres pays largement impliqués dans les GVC.

Cette dissertation a apporté des aperçus et des contributions particulières au débat sur le rôle des IDE et du commerce international pour les économies émergentes. Tout d'abord, à notre connaissance, nos travaux sont les premiers visant à examiner de manière systématique les IDE au niveau désagrégé, à la fois à l'aide d'un modèle théorique au niveau sectoriel et à l'aide des micro-données de panel du Vietnam. Deuxièmement, la thèse ouvre de nouveaux aspects dans l'étude de l'IDE qui permettent de mieux comprendre ses caractéristiques et son comportement par rapport aux autres sources de croissance dans les économies en développement et en transition. En particulier, dans le premier essai, nous démontrons que l'attraction de l'APD en intrants complémentaires est capable d'aider les pays hôtes à simultanément améliorer les conditions de l'infrastructure sociale et attirer les flux d'IDE. Dans le deuxième essai, en comparant la performance des entreprises détenues par des capitaux étrangers aux entreprises purement vietnamiennes, dans des dimensions tant statiques que dynamiques, nous avons montré que la rentabilité actuelle ne compte pas dans la décision d'investisseurs étrangers et les entreprises étrangères ne sont pas nécessairement plus

grandes, plus rentables ou plus intensives en R&D que leurs homologues domestiques, comme le suggère pourtant la littérature théorique. Enfin, la caractéristique la plus frappante qui peut être tirée du dernier essai est l'évidence selon laquelle les exportateurs sont moins performants que les non-exportateurs en raison de la présence des exportateurs de transformation. Cette constatation est contraire à la suggestion du modèle de Melitz (2003), soulignant qu'un mouvement vers l'exportation peut améliorer la productivité globale du secteur, car les exportateurs sont normalement considérés comme plus productifs que les non-exportateurs. Troisièmement, nos études contribuent à enrichir les recherches empiriques sur l'IDE dans les pays en développement, notamment les petites économies. En effet, le boom des flux d'IDE vers les pays en développement n'a commencé que depuis les années 1990, surtout après les crises financières en Asie et en Amérique latine entre 1995 et 2002 qui ont permis aux pays en développement et aux pays nouvellement industrialisés de s'appuyer principalement sur l'investissement étranger direct afin de compléter l'épargne nationale par les entrées de capitaux externes et de promouvoir le développement économique.

Sur la base des considérations ci-dessus, trois séries d'implications politiques importantes sont proposées. Premièrement, nos constatations sur la relation entre l'APD et l'IDE recommandent que les pays hôtes doivent attirer en priorité l'APD dans les secteurs complémentaires plutôt que l'APD dans les secteurs du capital physique, car l'APD dans les secteurs complémentaires contribue non seulement à renforcer les infrastructures sociales des pays hôtes mais aussi améliorer l'efficacité des afflux d'IDE vers ces pays. Entre-temps, une fois que l'APD financera les secteurs du capital physique, ils élimineront l'IDE. Le total des avantages apportés par eux sera donc affaibli. Deuxièmement, les résultats du deuxième chapitre suggèrent que le gouvernement vietnamien doit prendre note de deux préoccupations majeures incluant les prix de transfert erronés des multinationales et les coûts irrécupérables. A propos des coûts irrécupérables, le gouvernement devrait améliorer la transparence de l'information réglementaire, en particulier dans le système fiscal, le foncier et les procédures

administratives afin que tous les acteurs économiques aient la même chance d'accéder aux informations nécessaires et donc de réduire les corruptions et les coûts irrécupérables. En ce qui concerne les prix de transfert erronés, il est important d'harmoniser les politiques fiscales du Vietnam avec celles des concurrents internationaux afin de réduire le transfert de profit. En plus, les décideurs devraient assurer un calendrier fiscal prévisible aux entreprises pour qu'elles soient en mesure d'estimer leur charge future. Alors, au lieu de transférer leur profit, les entreprises étrangères seront donc plus susceptibles de garder leurs revenus vitaux au Vietnam qui seront utilisés pour compenser les services publics et les infrastructures, ceux qui sont considérés comme les inconvénients stratégiques les plus importants du climat d'investissement vietnamien. Enfin, en basant sur les conclusions du troisième chapitre, nous proposons qu'en présence du commerce de transformation, la réallocation des ressources vers les entreprises attendues ne puisse pas inciter de grands gains agrégés de productivité parce que les entreprises de transformation sont les moins productives. Cependant, les entreprises moins productives pourraient bénéficier de façon dynamique de leur participation aux chaînes de valeur mondiales, car il pourrait y avoir des retombées de la connaissance et/ou l'apprentissage par la pratique à partir de la procédure de transformation. Par conséquent, le coût, ainsi que les avantages du traitement des exportations, devraient être revus de façon critique par les pays qui effectuent le commerce de transformation ou qui prévoient de le faire.

Pour conclure, cette thèse ouvre de nouvelles pistes pour de nouvelles perspectives de recherche sur l'IDE à plusieurs niveaux. Dans le premier chapitre, en raison de la limitation de la base de données, nous n'avons pu étudier qu'un panel de 32 pays en développement sur 8 ans. La petite taille de l'échantillon peut conduire à un biais de nos conclusions sur les effets des variables explicatives. Par conséquent, dans la recherche future, nous enrichirons nos données afin d'augmenter la variance croisée du temps de l'ensemble des variables indépendantes et d'assurer la confiance des résultats empiriques. Ensuite, nous

aimerions développer la deuxième recherche en mettant l'accent sur les déterminants des choix de la propriété du mode d'entrée et leurs effets sur la performance de l'entreprise. Fondamentalement, la théorie du mode d'entrée suppose que les entreprises choisissent le mode qui fournit le meilleur retour sur investissement. En même temps, la théorie des coûts de transaction maintient que les coûts de recherche, de négociation et de suivi des actions des partenaires potentiels influencent le choix du mode d'entrée. Par conséquent, les modes sélectionnés en fonction du modèle de coût de transaction fournissent aux entreprises la structure la plus efficace. Les études les plus remarquables dans ce domaine sont: Hill et al. (1990), Woodcock et al. (1994), Brouthers (2002)...Enfin, nous avons l'intention d'approfondir la robustesse de nos nouveaux faits stylisés sur le Vietnam par une mesure alternative de la productivité. Selon Ha and Kiyota (2014), les résultats de régression peuvent être biaisés en raison de la mesure de la productivité. Étant donné que dans notre travail, les données couvrent les grandes et les petites entreprises, la taille de l'entreprise peut affecter l'entreprise de référence, qui est construite aux moyennes arithmétiques du total des entreprises. Pour résoudre ce problème, au lieu de calculer la TFP en utilisant la moyenne de l'entreprise de référence, nous pouvons compter sur sa médiane pour la calculer. De plus, à la suite de Lu et al. (2010), nous voulons lier cette nouvelle évidence à des modèles micro pour mieux comprendre les stratégies et les performances d'internationalisation des entreprises. D'autre part, nous avons l'intention d'étudier davantage le lien entre ces nouveaux éléments de preuve et les modèles macro afin de mieux comprendre la contribution des entreprises étrangères à la croissance de la productivité, de l'emploi et des salaires dans une économie émergente.



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## Long Résumé

Selon Ozawa (1992), il existe deux types de régimes de commerce et d'investissement: un tourné vers l'extérieur, orienté vers l'exportation (OL-EO) et l'autre tourné vers l'intérieur, axé sur la substitution des importations (IL-IS). Il est bien connu que le modèle OL-EO qui se caractérise par une mobilité croissante des facteurs internationaux, principalement sous la forme d'investissements directs étrangers (IDE), est plus efficace et plus préféré que le modèle IL-IS, en particulier dans les pays asiatiques en développement qui ont atteint une forte croissance économique grâce au développement commercial et à l'ouverture de leurs économies. Cela explique pourquoi la croissance significative de l'IDE reflétée dans les valeurs de la production internationale représente une part importante dans l'économie mondiale. À bien des égards, les multinationales (MNC) sont devenues le noyau d'une grande partie des transactions internationales. Sans aucun doute, au cours des dernières décennies, l'expansion des IDE et l'augmentation continue des multinationales ont considérablement modifié la structure des activités économiques mondiales.

En conséquence, les études tant théoriques qu'empiriques sur l'IDE sont nombreuses. Généralement, les questions principales sur lesquelles ces études portent sont: la relation entre l'IDE et la croissance économique; les déterminants de l'IDE; les effets (de retombées) des firmes étrangères sur les firmes domestiques; ou la promotion de l'IDE. Évidemment, les multinationales sont placées au cœur de nombreuses disciplines et de nombreux débats. La théorie des multinationales s'intéresse aux questions de savoir pourquoi les multinationales existent et pourquoi elles investissent à l'étranger. Dans ce champ, un sujet d'intérêt constant pour les chercheurs est la performance comparative des firmes domestiques par rapport aux firmes détenues par des capitaux étrangers. Les études empiriques concernant à ce sujet sont diverses: écarts de salaire; écarts de compétences; écarts de la relation de travail; écarts de la croissance; écarts de rentabilité; écarts de technologie; écarts de productivité, qui ont attiré la plus grande attention de la recherche empirique. Compte tenu de ce contexte, nous avons l'intention de contribuer à ce domaine de recherche en deux respects principaux. D'abord, nous fournissons une base analytique pour caractériser la relation entre les flux d'IDE entrants et les autres flux de capitaux internationaux vers les pays en développement octroyé via l'aide publique au développement (APD). Ensuite, nous examinons l'hétérogénéité des entreprises en ce qui concerne la propriété, domestique versus étrangère, et le type d'activité commerciale, transformation (*processing*) versus commerce ordinaire, dans le cas d'un petit pays en développement, en mettant l'accent sur l'économie vietnamienne. Nous avons choisi le Vietnam comme étude de cas parce que c'est un cas de réussite d'attrait des IDE et en raison de la disponibilité de ses micros données. Particulièrement, la thèse est structurée en trois chapitres comme suit.

Dans le chapitre 1, nous proposons de nous concentrer sur la question : comment promouvoir les entrées d'IDE vers les pays en développement en examinant les liens de causalité entre les flux d'IDE et les flux d'APD. Nous tentons de vérifier si la relation entre l'IDE et l'APD est davantage susceptible d'être complémentaire ou substituable. Nous suivons Selaya and Sunesen

(2012) dans l'expansion du modèle de Solow (1957) pour une petite économie ouverte afin d'étudier les impacts de l'APD sur l'IDE. Selon Kimura and Todo (2010), nous estimons notre modèle par des méthodes de Variables instrumentales (IV). En effet, notre modèle préféré est l'estimateur *System-GMM* (S-GMM) proposé par Blundell and Bond (1998) qui utilise des conditions de moment supplémentaires. Nous utilisons les données du panel ventilées par industrie à travers 32 pays en développement pendant 8 ans de 2003 à 2010. Nos analyses statistiques confirment que l'IDE représente la principale source de financement externe de ces pays. En distinguant les IDE par deux grandes catégories, nous constatons que les IDE sont plus concentrés dans le capital physique tandis que les APD sont plus intensives dans les intrants complémentaires. En outre, les nouvelles économies émergentes d'Asie semblent être les destinations les plus attrayantes de l'APD en termes d'intrants complémentaires ainsi qu'en termes d'IDE. Parmi ces pays, le Vietnam est considéré comme un cas typique à étudier. En ce qui concerne l'évidence empirique, nos résultats au niveau agrégé soutiennent le point de vue selon lequel l'effet substituable de l'APD sur l'IDE surpasse son effet complémentaire. Ce résultat est cohérent avec les résultats précédents de Caselli and Feyrer (2007) et Beladi and Oladi (2006), mais contraste avec ceux de Asiedu et al. (2009), Blaise (2005) et Selaya and Sunesen (2012). C'est-à-dire que la nature et l'étendue de la relation (complémentaire ou substituable/ positive ou négative) peuvent varier d'un pays à un autre. Au niveau intersectoriel, nos résultats appuient fortement l'hypothèse selon laquelle l'APD investie dans les inputs complémentaires ( $ODA_A$ ) (par exemple en infrastructures publiques ou en éducation) complète l'IDE investi dans le capital physique ( $FDI_K$ ) tandis que l'APD financée aux secteurs du capital physique ( $ODA_K$ ) substitue des investissements étrangers privés. Cependant, contrairement à la supposition proposée par Selaya and Sunesen (2012), nous montrons qu'il n'y a pas assez d'évidence pour conclure que l'APD dans le capital physique évince un à un l'IDE de même type. En examinant davantage la composition de l'IDE, nous voyons aussi que l'IDE investi en intrants complémentaires a le même comportement que son homologue APD. Nous suggérons alors que l'IDE dans les secteurs complémentaires renforce plus l'efficacité de l'IDE dans les secteurs du capital physique. De plus, nous constatons aussi que la qualité de la gouvernance (l'indice de Kaufmann) représente un déterminant indirect plutôt qu'un déterminant direct de  $FDI_K$  car la signification du coefficient estimé  $FDI_K$  sera changée une fois que nous contrôlons l'effet d'interaction entre l'indice de Kaufmann et  $ODA_K$ . En bref, nos conclusions empiriques suggèrent la recommandation d'investir l'APD dans les inputs complémentaires ce qui permettra d'accroître l'accumulation et l'efficacité des investissements étrangers en capital physique dans les pays en développement.

Dans le chapitre 2, en utilisant des micro-données de panel pour les entreprises situées au Vietnam, nous cherchons à vérifier les différences de performance entre les firmes étrangères et les firmes domestiques dans les secteurs manufacturiers. Nos données proviennent de l'Enquête annuelle sur les entreprises (ASOE) fournie par l'Office Statistique Général (OSG) du Vietnam qui couvre toutes les entreprises enregistrées au Vietnam au cours de la période de 2000 à 2013. Les données ASOE présentent les avantages suivants. Premièrement, l'enquête est exhaustive

(toutes les entreprises enregistrées sont couvertes, sans seuil de taille, à l'exception des activités des ménages). Deuxièmement, ces données comprennent des informations comptables pertinentes sur les extrants, les intrants et les exportations. Enfin, les données ASOE incluent des informations clés qui nous permettent d'identifier à la fois la propriété de l'entreprise et le type de commerce dans lesquels les firmes sont impliquées. En résumé, après le nettoyage, notre échantillon se compose d'environ 194,900 entreprises manufacturières au cours de la période 2000-2013. Selon Kimura and Kiyota (2007), nous vérifions les différences de caractéristiques entre les firmes étrangères et les firmes domestiques à la fois dans *les aspects statiques*, y compris les indicateurs de base tels que la rentabilité (rendements des actifs- ROA et rendement des capitaux propres- ROE), la productivité (valeur ajoutée-VA et productivité totale des facteurs- PTF) et d'autres caractéristiques telles que la taille de l'entreprise; et dans *les aspects dynamiques* en testant si les entreprises potentiellement rentables sont rachetées ou non par des capitaux étrangers sous la forme de Fusions Et Acquisitions-M&A. Pour examiner ceci, le modèle analytique dynamique développé par Roberts and Tybout (1997) et Bernard and Jensen (2004) sera traité. Nous testons l'hypothèse de travail selon laquelle les multinationales surpassent les entreprises domestiques et réalisent une croissance plus rapide que celles-ci. Nous vérifions également si les entreprises domestiques qui sont potentiellement rentables sont davantage susceptibles d'être acquises et si les entreprises acquises sont davantage capables de survivre sur le marché vietnamien que les entreprises domestiques. Les traits les plus frappants de ce chapitre sont triples. Premièrement, nous fournissons des éléments de preuve qui confirment que les entreprises de propriété étrangère surpassent les entreprises purement domestiques en termes de productivité, mais qu'elles sont moins performantes que ces dernières en termes de rentabilité. Cette preuve est cohérente avec le phénomène appelé *prix de transfert* qui provoque la sous-estimation de la rentabilité réelle des entreprises détenues par des capitaux étrangers causant le biais de notre estimation. Deuxièmement, nous constatons que les entreprises de possession étrangère croissent plus rapidement que les entreprises domestiques dans toutes les marges de performance. Néanmoins, une fois que nous contrôlons les effets de la taille de l'entreprise et des dépenses de R&D/Ventes, les entreprises étrangères sont moins rentables que les entreprises domestiques. Troisièmement, en vérifiant la survie des entreprises étrangères par rapport aux entreprises vietnamiennes, nous constatons que les entreprises étrangères semblent survivre mieux sur le marché vietnamien que les entreprises domestiques. En respectant l'intervention politique, nous démontrons deux préoccupations majeures auxquelles les décideurs vietnamiens doivent faire face: le premier est les prix de transfert erronés au sein des multinationales et le second est la présence de coûts irrécupérables, ce qui plaide en faveur de davantage de rigueur des lois sur les investissements ainsi qu'en faveur de la transparence de l'environnement d'investissement, qui devraient être améliorés afin que le Vietnam reste une destination attrayante des IDE et que ces derniers contribuent à accroître la richesse du pays.

Dans le chapitre 3, en nous appuyant sur la même base de données utilisée dans le chapitre 2, nous étudions, comme point de départ, les distributions des intensités d'exportations des entreprises manufacturières opérant au Vietnam. Tandis que la distribution de ces intensités

d'exportation diminue de façon monotone dans tous les pays développés (au sein duquels opèrent une majorité de firmes non exportatrices et une très faible minorité de firmes très fortement exportatrices), cette même distribution s'est révélée en forme de U dans certaines économies émergentes, en particulier celles qui prennent une part importante dans les chaînes de valeur mondiales (CVM) comme la Chine et le Mexique, etc. Donc, nous étudions si ce modèle en U se tient également pour le Vietnam. Notre échantillon se compose d'environ 24,000 entreprises manufacturières en moyenne sur la période 2010-2013 avec 6,300 entreprises manufacturières en 2000 comme l'année de référence. Pour examiner les primes à l'exportation qui différencient les exportateurs ordinaires et les exportateurs de transformation (*processing firms*), nous commençons par des mesures non paramétriques en définissant les primes à l'exportation comme des différences systématiques dans *quelques* caractéristiques des entreprises exportatrices par rapport aux non-exportatrices après avoir contrôlé des effets d'industries, des effets spécifiques aux années et des effets de cohortes. Nous estimons ensuite l'exportation  *premia* de façon paramétrique en régressant certaines des caractéristiques de l'entreprise sur leur statut d'exportation discriminant les exportateurs ordinaires et les transformateurs. Dans notre spécification préférée, nous présentons les effets fixes industrie, année et cohorte ainsi que le contrôle de la taille, de la propriété et de l'intensité du capital. Quant à nos variables dépendantes, nos principales variables d'intérêt sont la productivité totale des facteurs (PTF), la productivité du travail, la productivité du capital et le salaire moyen par travailleur. Nous révélons de nouveaux faits indiquant que les entreprises de transformation sont moins productives et paient des salaires plus bas que leurs homologues ordinaires (même parfois que les entreprises non exportatrices). Ce modèle anormal est plus frappant pour les entreprises étrangères et les entreprises opérant au sein des zones non tarifaires (NTZ). Ces preuves sont contraires à celles trouvées dans les travaux précédents qui documentent l'efficacité productive supérieure des entreprises exportatrices par rapport à celles qui ne sont pas exportatrices dans une grande variété de pays développés (Bernard and Jensen (1995, 1999), Clerides et al. (1998), Bernard and Wagner (1997), Aw et al. (2000)), mais en ligne avec les résultats pour la Chine (Lu (2010), Lu et al. (2010), Dai et al. (2016)) et d'autres pays très impliqués dans GVC. Dans l'ensemble, nos résultats indiquent que le commerce de transformation est une activité exceptionnelle qui devrait être étudiée séparément par rapport à d'autres types de commerce pour spécifier sa contribution à la productivité ainsi que la dynamique des salaires dans les économies émergentes.

**Mots-clés:** APD, IDE, propriété étrangère, performance des entreprises, comportement à l'exportation des entreprises, commerce de transformation, pays en développement, Vietnam.

## Abstract

FDI flows to developing countries have strongly increased over the last 30 years. At the same time, the theory has made progress to offer a better account on how FDI inflows impact economies in the presence of heterogeneous firms. Considering both trends, there is a new room for investigating the role of FDI in developing economies. In chapter 1, we examine the causality links between FDI and ODA. Our aggregated results reveal that the substitutable effect of ODA on FDI overbalances its complementary effect. Meanwhile, our disaggregated results show that ODA in complementary inputs ( $ODA_A$ ) complements FDI in physical capital ( $FDI_K$ ) while  $ODA_K$  substitutes  $FDI_K$ . We also find that  $FDI_A$  has the same behavior as  $ODA_A$ . In chapter 2, by using Vietnamese micro-panel data, we verify differences in performance between foreign and domestic firms. First, we find that foreign firms outperform domestic firms in terms of productivity but under-perform them in terms of profitability. Second, foreign firms grow faster than domestic firms in all margins of performance. However, they become less profitable than domestic firms once controlling for the firm's size and R&D effect. Third, foreign firms survive better than domestic firms on the Vietnamese market. We explain the low profitability of foreign firms by the transfer mis-pricing and the sunk cost. In chapter 3, relying on the same database used in chapter 2, we investigate firms' export behavior in Vietnam. We find that the distribution of export intensities in Vietnam displays a U-shaped pattern like the one found for countries strongly engaged in GVCs. We next examine the export premia discriminating ordinary and processing exporters. We find that processing exporters are less productive and pay lower wages than non-processing exporters and even than non-exporters. This pattern is more obvious among foreign firms and firms in the non-tariff zones. All in all, our thesis shows that, even if FDI represents an important source of growth for developing countries, more disaggregated analyses are still needed to understand how those inflows impact a domestic economy through firm dynamics phenomena.

**Keywords:** ODA, FDI, foreign ownership, corporate performance, firms' export behavior, processing trade, global value chains, developing countries, Vietnam.

## Résumé

Les flux d'IDE vers les PVD ont augmenté au cours des dernières années. En même temps, la théorie a fait des progrès pour offrir une meilleure prise en compte sur la question de savoir comment les entrées d'IDE influencent les économies en présence d'entreprises hétérogènes. Compte tenu de ces deux tendances, il y a encore une nouvelle place pour étudier le rôle des IDE dans les PVD. Dans le chapitre 1, nous examinons l'interaction entre les IDE et l'Aide Publique au Développement (APD). Nos résultats agrégés révèlent que l'effet substituable de l'APD sur les IDE contrebalance son effet complémentaire. Entre-temps, nos résultats désagrégés montrent que l'APD aux intrants complémentaires (de type infrastructures, éducation...),  $APD_A$  complète les  $IDE_K$  (IDE dans le capital physique), alors que les  $APD_K$  prennent la place des  $IDE_K$ . Nous constatons aussi que les  $IDE_A$  ont le même comportement que les  $APD_A$ . Dans le chapitre 2, en utilisant des données de panel microéconomiques du Vietnam, nous vérifions les différences en termes de performance entre les entreprises étrangères et les entreprises domestiques. Tout d'abord, nous constatons que les entreprises étrangères surpassent les entreprises domestiques en termes de productivité, mais affichent un rendement inférieur en termes de rentabilité. Deuxièmement, les entreprises étrangères se développent plus rapidement que les entreprises domestiques dans toutes les marges de performance. Cependant, elles deviennent moins rentables que les entreprises domestiques une fois que la taille de l'entreprise et l'effet R&D sont contrôlés. Troisièmement, les entreprises étrangères ont tendance à mieux survivre que les entreprises domestiques sur le marché vietnamien. Nous expliquons la faible rentabilité des entreprises étrangères par les prix de transfert et le coût irrécupérable substantiel. Dans le chapitre 3, en nous basant sur la même base de données utilisée dans le chapitre 2, nous étudions le comportement des firmes exportatrices au Vietnam. Nous constatons que la répartition des intensités d'exportation au Vietnam affiche plutôt une forme de U comme celui trouvé pour les pays fortement engagés dans les chaînes de valeur mondiales. Nous examinons ensuite les primes à l'exportation en distinguant les exportateurs ordinaires et les exportateurs de transformation. Nous constatons que les exportateurs de transformation sont moins productifs et paient des salaires plus bas que les exportateurs ordinaires et même que les non-exportateurs. Cette tendance est plus évidente parmi les entreprises étrangères et les entreprises localisées dans les zones non tarifaires. Dans l'ensemble, notre thèse montre que, même si l'IDE représente une source importante d'entrée de capitaux pour les PVD, des analyses plus détaillées sont encore nécessaires pour mieux comprendre comment cette entrée de capitaux se transforme en source de croissance pour l'économie nationale au travers de phénomènes de dynamique d'entreprises.

**Mots-clés:** APD, IDE, propriété étrangère, performance des entreprises, comportement à l'exportation des entreprises, commerce de transformation, chaînes de valeur mondiales, pays en développement, Vietnam.

