Thesis for the Degree of Master of Business Administration

Foreign Direct Investment (FDI) and Exports:

- With a focus on the Case of Vietnamese Economy -

Supervisor
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February 2007

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Department of International Trade and Economics

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국문초록

해외직접투자(FDI)와 수출:

-베트남경제의 사례를 중심으로-

    1986 년부터 베트남정부는 도이모이(Doi Moi)정책을 도입하여 중앙계획경제에서 사회주의시장지향적 경제로 이전되기 시작하였다. 그 이후로 해외직접투자(FDI)가 베트남 경제로 점차 많이 유입되기 시작하였다.

    베트남은 전통적으로 풍부한 천연자원을 보유하고 있습니다. 베트남의 격언에는 "황금 숲과 은바다"라고 불리워지고 있습니다. 여기에는 값비싼 석유, 바다속의 미개척의 광물, 생물자원이 풍부한 열대 숲 등의 자원이 포함되어 있습니다. 베트남의 기후는 다양한 자원을 매우 효율적으로 사용하게 하여 농업생산성이 매우 높고 질좋은 농산물과 수산물을 많이 생산하고 있습니다. 이러한 비교우위로 인하여 베트남은 세계적으로 주요한 농산물과 해산물의 수출국이 되었고 특히 FDI 의 최대유입국이 되었습니다. 따라서 FDI 의 유입과 무역은 베트남의 경제성장에 중요한 역할을 하고 있고, 많은 경제학자들의 연구대상이 되어 왔습니다.

    본 논문은 1988 년부터 2005 년까지의 베트남경제의 자료를 분석하여 베트남의 FDI 와 무역간의 관계를 보는데 촛점을 맞추었습니다. 시계열회귀분석과 파라메터의 추정을 통하여 FDI 의 유입은 수출에 의미있고 플러스적인 영향을 주고 있다는 결과를 얻었습니다. 그리고 베트남경제에서 FDI 의 유출과 수출과의 관계에서 볼때 FDI 의 유출은 수출에 보완적 역할(complement)과

대체적 역할(substitute)하고 있습니다. 본 논문에서는 시계열변수의 정체성(stationarity)을 검증하고 베트남 경제의 FDI 흐름과 수출간의 관계를 추정하였습니다. 그 결과 수출과 FDI 유입과 FDI 유출의 단위근검정(Unit Root Test)에서는 제 1 차분(first difference)에서 정체적이라는(stationary) 것이 확인되었고 FDI 유입과 유출은 수출을 일으키는 영향이 보다 분명하게 나타났으나 수출로 인하여 FDI 유입과 FDI 유출에 미치는 영향은 덜 뚜렷하게 나타나고 있음을 확인하였다. 이러한 결과에서 볼 때 베트남 경제는 투자가 수출을 유인하는 효과가 수출이 투자를 유인하는 효과보다 더 뚜렷하게 나타날 수 있다는 것을 발견하였다.

본 연구는 여러 가지 약점을 갖고 있다. 특히 시계열자료의 기간이 짧다는 문제점은 있고 또한 FDI 는 수출 뿐 만아니라 고용, 소득, 교육 등과도 중요한 영향관계를 갖고 있기 때문에 이들 변수와의 관계를 분석하는 것도 향후의 연구과제로 필요성이 매우 크다고 생각된다.

Foreign Direct Investment (FDI) and Exports:

- With a focus on the Case of Vietnamese Economy -

Abstract

Since 1986, Vietnamese Government introduced the Doi Moi (renovation) program and economic reforms, and started its transition from a centrally planned economy to a socialist-oriented market economy. Since then, foreign direct investment (FDI) started to flow into Vietnam.

Vietnam has abundant natural resources named in Vietnamese as "golden forest and silver sea", including valuable resources such as oil, unexplored minerals in the sea, biological resources of its vast tropical forest, etc. Vietnam's climate makes many of these resources particularly attractive, permitting several crops per year, as well as high quantity agricultural and fishing products. With these advantages, Vietnam is now a major exporter of agricultural products food and seafood in the world and is one of countries attracting largest inflows of FDI in the region.

The flows of FDI and trade play an important role for Vietnamese economic growth, the importance of FDI and trade have been researched by some economists. Therefore, this thesis investigates the FDI flows and trade in

Vietnam with a focus on the relationship between FDI and export using data for period 1988-2005. Time series regressions for economy and data estimation indicate that FDI inflows have significant and positive effect on the export. The relationship between outflows of FDI and export allows FDI outflows to function as both a complement and substitute for country exports. In order to determine the stationary of time series and relationship between FDI flows and export for Vietnamese economy, the paper applies some methods of test as: *Unit root test* and *Granger Causality test* by using the Eviews 5.0 software to calculate the results. The results of tests imply that Export, FDI-in and FDI-out are stationary time series in first differences form, and the complement relationship between FDI flows and Export, however, the effects of FDI-in and FDI-out on Exports are larger than these of Exports on FDI flows under clearly calculation of Granger Causality test.

This thesis also has some limitations. An eighteen-year period is not very long to be able to obtain the absolute results for the relationship between FDI and export. Moreover, FDI is very important not only to export but also to employment, income, education, infrastructure, etc. Within the limit of this thesis, we only focus on the causality relationship between FDI and export. The other factors will be investigated in the future researches.

CONTENTS

LIST OF FIGURES

Page

LIST OF TABLES

Chapter 1   Introduction

Since 1986, Vietnamese government introduced the Doi Moi (renovation) program and economic reforms, and started its transition from a centrally planned economy to a socialist-oriented market economy. Since then, the inflows of FDI started to flow into Vietnam. Initially, FDI focused on the mining industry and the oil and gas industry as Vietnam is rich in natural resources.

Vietnam's economy has been among the fastest growing economies in the region. Its economic structure reflected an increase in share of industry and services while share of agriculture declined. Vietnam has been successful in poverty reduction strategies and has been able to ensure rapid growth. Among the factors that led to this success, FDI has played a very important role. It has been providing Vietnam's economy with its relatively scarce factors, capital, and representing an extremely important instrument for integration in the world economy, especially at the region level. FDI has been recognized as an important resource for economic development. Many people argue that the FDI flows could fill the gap between foreign investments and domestically mobilized saving. It also may increase tax revenue and improve management, technology, as well as labor skill in host countries. Additionally, FDI may help the host country to break out of the vicious cycle of underdevelopment (T.T. Do, 2005) and (D.D. Le, 2002).

Multinational enterprises (MNEs) generate the global flows of FDI and they are also extremely important for global trade flows. The export and local

production are alternative ways to serve the demand in a foreign market. It suggests a subsidiary relationship between FDI and trade. Moreover, MNE affiliate production can generate a demand for intermediate goods from the parent, resulting in a complementary relationship between flows of FDI and trade (exports). Exports can affect on the economy through productivity enhancing externalities such as technology spillovers and FDI can indirectly enhance economic growth. However, there is also a possibility that outward FDI flows could reduce host country exports, providing an argument for governments to restrict outward FDI.

This paper aims to investigate the relationship between FDI and exports on the macroeconomic level for the Vietnamese economy. It focuses to analyze some problems such as: How have FDI flows affected flows of exports? Does FDI generate exports or do exports generate FDI? By using some analyzing methods as *Ordinary least squares, Unit root test, Causality test* to determine the stationary of time series and causality relationship between FDI flows and export for Vietnamese economy. The *Eviews 5.0 software* is applied to obtain the results of tests.

The remainder of the paper is organized as follows. Chapter 2 shows literature reviews about the existing theoretical and empirical findings regarding the relationship between FDI and trade in general and these of Vietnam in particular. Chapter 3 provides an overview of the role of FDI and trade in the Vietnamese economy, with a focus on the relationship between FDI and exports. Chapter 4 presents the empirical analysis with a more formal analysis of the relationship between FDI and exports including descriptions of data for FDI flows and trade in the period 1988-2005; introduces the test methodology and results of Unit root test and Granger causality test. Finally, Chapter 5 is conclusion.

Chapter 2   Literature Review

The objective of this chapter is to review the existing knowledge about the relationship between FDI and trade. Section 2.1 examines the theoretical findings, section 2.2 reviews empirical studies, and section 2.3 presents the overview of studies on FDI in Vietnam.

2.1 Theoretical Background of FDI and Trade

There are a number of international organizations and the researchers that offer definition of FDI. According to the World Bank (WB), FDI is defined as follows:

"Investment made to acquire a lasting management in an enterprise operating in a country other than that of the investor. In general, investment which includes at least a 10 percent ownership of an enterprise is considered as FDI" (WB).

The FDI definition is given by International Monetary Fund (IMF) as follows:

"FDI is the category of international investment that reflects the objective of a resident entity in one economy obtaining a lasting interest in an enterprise resident in another economy. The lasting interest implies the existence of the long term relationship between the direct investor and the enterprise, and a

significant degree of influence by the investor on the management of the enterprise." (IMF, 1993)

The United Nations defines FDI as "an investment involving a long term relationship and reflecting a lasting interest of a resident entity (individual or business) in one economy (direct investor) in an entity resident in an economy other than that of the investor (host country)". [1]

In general, FDI has been defined as the long-term investment made by non-resident of a host country through the creation or acquisition of capital assets in the host country. FDI implies the ownership of capital assets large enough to have full or partial control of the enterprise and a physical presence by foreign firms or individual. In this sense, FDI includes not only the transfer of investment capital, but also a whole package of physical capital, modern technology, techniques of production, managerial and marketing knowledge and business practices. [1]

Theoretical research regarding the relationship between FDI and trade has focused on the question whether these flows are complements or substitutes. A reason for the interest in this relationship is the link between MNE production and employment in the home country and MNE production in foreign countries. A fear among trade unions and workers is that increased MNE production in foreign host countries might substitute for MNE production in the home country, reducing employment. [2]

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[1] T.T. Do (2005). "The impact of foreign direct investment and openness on Vietnamese economy", [Online]. Available: <http://dalea.du.se/theses/archive/efeebfa6-40c9-4f3f-84da-119a4a7e7588/80a63fc6-5f0d-4371-8527-08f4a04e43d2.pdf>

[2] Johnson (2006). "FDI and exports: the case of high performing East Asian economies". *CESIS electronic working paper series*, The Royal Institute of technology.

The OLI paradigm was studied by John Dunning (1979).[3] His research has shown the usefulness of the OLI paradigm that is a framework for analyzing the decision to engage in FDI, based on three kinds of advantage that FDI may provide in comparison to exports: Ownership, Location, and Internalization. The relationship between FDI and trade can be discussed in relation to these advantages. If the host country does not have a location advantage, the MNE will serve the foreign economy through exports, suggesting a substitutional relationship between FDI and trade.

The new trade theory emerging during the early 1980s generated more realistic general equilibrium trade models which could handle increasing returns to scale, imperfect competition and differentiated products. These models are based on the ideas of ownership and location advantages presented in the OLI paradigm. The new trade theory has been able to incorporate the relationship between FDI and trade. However, early models were not very helpful in handling MNEs and FDI due to the assumption of single-plant national firms, excluding the existence of MNEs, but more recent models allow for MNEs to arise endogenously. (A. Johnson, 2006)

The horizontal and vertical FDI is distinguished by new trade theory models. For vertical FDI, the MNE analyzes the production process into stages according to factor intensity. Production activities are located in order to exploit differences in factor cost and therefore minimize production costs. Horizontal FDI implies that the MNE is locating production close to the final market. The production process is duplicated and demand in foreign markets is served by local production, reducing trade costs. (A. Johnson, 2006)

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[3] Dunning, J.H. 1979. "Explaining Changing Patterns of International Production: In Defence of an Eclectic Theory," *Oxford Bulletin of Economics and Statistics*.

According to Helpman (1984)[4], he presents a model of vertical MNEs and FDI. His paper develops a general equilibrium trade model based on differences in factor endowments. Firms are modeled as having one labor-intensive activity and one capital-intensive activity. MNEs only increase if the differences in factor endowments are large enough. Besides, Markusen (1984)[5] provides a general equilibrium model incorporating horizontal MNEs. The model is based on firm-level scale economies by possessing a technical advantage in the form of an innovation. Therefore, the MNE has an incentive to duplicate the production process resulting in horizontal FDI.

Under Helpman (1984) and Markusen (1984), the distinction between horizontal and vertical FDI implies the relationship between FDI and trade. In the case of horizontal FDI, a substitutional relationship is expected. The MNE produces the good locally instead of exporting it from the home country. For vertical FDI, FDI is expected to have a complementary relationship to trade. Vertical FDI does not substitute for exports. Instead, demand for intermediate goods from the MNE affiliate can result in an increase in exports to the host country.

In recently, the distinction between horizontal and vertical FDI has been extended so-called knowledge-capital models. There models are presented in Carr D.L. and Markusen and Maskus (2002).[6] They allow combinations of

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[4] Helpman, E. (1984), "A simple theory of international trade with multinational corporations", *Journal of Political Economy*, Vol. 92, No. 3, pp. 451-471

[5] Markusen, J.R. (1984), "Multinationals, multi-plant economies and the gains from trade", *Journal of International Economics*, Vol. 16, pp. 205-226.

[6] Carr, D.L., Markusen, J.R., and Maskus, K.E. (2001), "Estimating the knowledge-capital model of the multinational enterprise", *American Economic Review*, Vol. 91, pp. 693-708.

horizontal MNEs, vertical MNEs and national firms. Knowledge-capital models consequently incorporate both a complementary and a substitutional relationship between FDI and trade.

However, according to Ekholm et al. (2004),[7] FDI can create an export-platform in the host country. Such export-platform FDI is defined as MNE production in a host economy when the output is sold in third markets and not in the parent or host country market. Ekholm et al. construct a three country model with two high-cost countries and one low-cost country. By performing numerical simulations of the model in order to find conditions result in export-platform FDI. The probability of this type of FDI emerging in the model is determined by the interaction of shipping costs and cost advantages between the countries. An export-platform model consequently predicts a complementary relationship between inward FDI and host country exports.

In the work of A. Johnson (2006), the review of the theoretical literature suggests that the form of FDI should have a strong influence on the relationship between FDI and trade. Table 2.1 presents a summary of the relationships suggested by the literature review.

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[7] Ekholm, J.R. et al. (2004), "Export-platform foreign direct investment", *Institute for International Integration Studies,* IIIS Discussion Paper No. 50

Table 2.1 The relationship between FDI and trade suggested by trade theory

Form of FDI	The primary relationship between FDI and trade	References
Horizontal	Substitutional	Helpman (1984)
Vertical	Complementary	Markusen (1984)
Knowledge-capital based	Complementary or substitutional	Carr et al. (2001), Markusen and Maskus (2002)
Export-platform	Complementary (inward FDI and host country exports are complements)	Ekholm et al. (2004)

Source: A. Johnson (2006). "FDI and exports: the case of high performing East Asian economies", pp. 9

Theoretical models of horizontal MNEs predict a substitutional relationship between outward FDI and exports. In this case, local MNE production substitutes for exports. Vertical models primarily predict a complementary relationship due to an increase in demand for intermediate goods. Knowledge-capital models are able to incorporate horizontal and vertical MNEs simultaneously, and consequently both complementary and substitutional relationships between FDI and trade are possible. Export-platform FDI suggests a complementary relationship between inward FDI flows and host country exports.

Table 2.1 shows that trade theory can support FDI and trade being either complements or substitutes depending on the form that FDI takes. Empirical studies therefore have to be used in order to find the exact nature of the relationship.

2.2 Empirical Researches of FDI and Trade

A substantial body of empirical research on the link between FDI and trade has emerged. Empirical studies are heavily focused on FDI generated by developed economies. Similarly to the theoretical contributions, most of the research efforts have concentrated on the link between outward FDI and source country exports. One of the first studies is Horst (1972),[8] analyzing the relationship between U.S. exports and FDI to Canada. Horst finds that exports and foreign investments are alternative ways for U.S. manufacturing firms to supply the Canadian market.

Data for individual U.S. firms are used by Lipsey and Weiss (1984)[9] in order to investigate the effect of foreign production on exports from the home country. They find that higher MNE affiliate sales in the host country were linked to higher exports from the MNE parent, that is, foreign production does not substitute for exports. The empirical results of the paper indicate that when a firm produces both final and intermediate goods, production of final goods in a host country can increase the exports of intermediate goods used in host country production from the source country.

Blonigen (2001)[10] is the first study that takes advantage of product level data when trying to determine whether FDI and trade are complements or substitutes. The paper uses data on Japanese production in the U.S. and

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[8] Horst, T. (1972), The industrial composition of U.S. exports and subsidiary sales to the Canadian market, *American Economic Review*, 62(1/2), 37-45.

[9] Lipsey, R.E. and Weiss, M.Y. (1984), Foreign production and exports of individual firms, *Review of Economics and Statistics*, 66(2), 304-308.

[10] Blonigen, B. (2001), In search of substitution between foreign production and exports, *Journal of International Economics*, 53, 81-104.

Japanese exports to the U.S. The author finds strong substitution effects between production in the U.S. and exports to the U.S. for both automobile parts and consumer goods. However, the paper also finds strong complementary effects between automobile production in the U.S. and imports of automobile parts, providing empirical examples showing that intermediate goods can result in a complementary relationship between FDI and trade.

A. Johnson (2006) investigated the flows of FDI and trade in eight high performing East Asian economies with a focus on the relationship between FDI and host country exports by using data for the period 1980 to 2003. The results of this paper suggest that inflows of FDI tend to have a positive effect on host country exports, possibly due to MNEs performing export-platform FDI. The paper has provided several references claiming that export orientation has been important for the improvement in standard of living in East Asia during the past decades. Since the findings of this paper suggest that FDI inflows tend to increase host country exports, inflows of FDI should be encouraged. Liberalizing FDI regulations could therefore result in an increase in inflows, possibly stimulating exports and eventually increasing the standard of living in developing economies.

In F. Seabra and L. Flach (2005),[11] a study on FDI and profit outflows: a causality analysis for the Brazilian economy is performed. This paper investigates the nature of the causal relationship between FDI and profit remittance in Brazil using the Granger causality test procedure developed by Toda and Yamamoto (1995). The findings of this paper indicate that FDI causes profit remittance and emphasize significant adverse long-run effects of FDI

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[11] F. Seabra and L. Flach (2005). "Foreign direct investment and profit outflows: a causality analysis for the Brazilian economy". *Economics Bulletin*, Vol. 6, No. 1, pp. 1-15.

attraction policies for the Brazilian economy.

2.3 Empirical Studies on FDI and Trade in Vietnam

Recently, many studies on FDI flows to Vietnam have been carried out. This section presents the overview of these studies and their findings.

In D.D. Le (2002),[12] an overview of FDI in Vietnam is provided. The author presents the results of implemented FDI since 1988 until mid 2002, the impacts of FDI on economic development in Vietnam and the decline of FDI since 1997 until 2002. The paper examines the challenges facing the ambiguous target that, Vietnam aims to implement US$ billion 12-15 during the period 2001-2005, the measures Vietnam wants to adopt to improve the investment climate and the prospect of FDI in Vietnam in the context of fierce competition in the region, especially with China.

N.B. Nguyen and J. Haughton (2002)[13] quantified the effects of the bilateral trade agreement (BTA) between Vietnam and the United States by first specifying and estimating a model of the determinants of FDI, using data from 16 Asian countries for 1990-1999. In seeking to explain the determinants of FDI flows, their model estimates an equation where the dependent variables are the log of real FDI/capita. Their main finding is that the impact on FDI is likely to be large, which in turn may boost economic growth by as much as 0.6 percentage point per year over the coming decade.

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[12] D.D. Le (2002). "Foreign direct investment in Vietnam: Results, achievements, challenges and prospect". *International Monetary Fund Conference on Foreign Direct Investment*. Hanoi August 16-17, 2002.

[13] N.B. Nguyen and J. Haughton (2002). "Trade liberalization and foreign direct investment in Vietnam. BTA and FDI to Vietnam", *Business Periodicals ASEAN Economic Bulletin*, No. 5 (Dec/2002).

In H. Mirza and A. Giroud (2004),[14] the regional integration and benefits from foreign direct investment in ASEAN economies is investigated with the case of Vietnam. This paper surveys transnational corporations with operation in ASEAN, and finds that Vietnam has now largely achieved its initial objective of being a major FDI recipient. The regional aspect is especially manifest in consumer electronics, although most subsidiaries in Vietnam still perform assembly type operations oriented toward the local market. This has to change if Vietnam is to maintain its development momentum. Under the threat of international competition and in order to maximize the dynamic gains from FDI, Vietnam has to reorient its policies and emphasize a shift toward targeting efficiency-seeking investment and developing more advanced links with transnational corporations regional and global value chains.

In V. Leproux and D.H. Brooks (2004),[15] the authors attempt to analyze the recent developments in FDI flows to Vietnam, particularly its impact on Vietnam's economy and the economic, political, and institutional weaknesses that must be faced in order to ensure a future capacity to receive more foreign capital and to build a system able to realize more of the potential benefits of FDI. The authors pay particular attention to the regional dimension of these issues because of the great historical importance of regional partners for Vietnam, especially before the Asian crisis, and because of the ASEAN Free Trade Area accession path that represents an important stage in Vietnam's further integration in regional production networks.

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[14] H. Mirza and A. Giroud (2004). "Regional integration and benefits from foreign direct investment in ASEAN economies: the case of Vietnam". *Asian Development Review*, Vol. 21, No. 1, pp. 66-98.

[15] V. Leproux and D.H. Brooks (2004). "Vietnam: Foreign direct investment and postcrisis regional integration". *ADB Working paper series* No. 56, Sep/2004

T.H. Tran (2004)[16] investigates the impacts of FDI on the poverty reduction in Vietnam. This author uses empirical panel data across provinces and cities in Vietnam for the research. The final results are used to recommend suitable policies to promote FDI and poverty reduction. An econometric approach using the ordinary least square method is used this paper to examine the effects of FDI on economic growth as well as the effects of FDI and economic growth on poverty incidence of each surveyed province. The model used to test the impact of FDI on economic growth comes from the Cobb-Douglass production function.

In T.T. Do (2005),[17] the impact of FDI on Vietnamese economy based on Partial Adjustment Model and time series data from 1976 to 2004 is examined. FDI is shown to have not only short run but also long run effect on gross domestic product (GDP) of Vietnam. However, elasticity of GDP with respect to FDI is small and takes many years to fully manifest itself. The impact of trade openness on GDP is also examined and it is shown to be stronger than that of FDI. The paper offers a number of explanations and discusses briefly suggestions in order to increase the contribution of FDI to Vietnam's economic development.

In T.T. Le (2005),[18] stating that studies on the impacts of FDI on Vietnam's economy, especially the Technological Spillovers are still very scarce compared

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[16] T.H. Tran (2004). "Impacts of foreign direct investment on poverty reduction in Vietnam". [Online]. Available: <http://www.grips.ac.jp/vietnam/VDFTokyo/Doc/18TTHungPaper.pdf>.

[17] T.T. Do (2005). "The impact of foreign direct investment and openness on Vietnamese economy", [Online]. Available: http://dalea.du.se/theses/archive/efeebfa6-40c9-4f3f-84da-119a4a7e7588/80a63fc6-5f0d-4371-8527-08f4a04e43d2.pdf.

[18] T.T. Le (2005). "Technological spillover from foreign direct investment: the case of Vietnam", [Online]. Available:<http://www.e.u-okyo.ac.jp/cirje/research/workshops/micro/micropaper04/micro_thesis/thuy2_handout.pdf>.

with other developing countries, the author makes an attempt to figure out the main channels and estimate the degree of Spillover effects in Vietnam using industry level data for 1995-1999 and 2000-2002 periods. The linkage between foreign investors and domestic private sectors is found to play an important role for Technological Spillovers from FDI in Vietnam. In this study, two approaches are employed: (1) indirect approach analyzing recent trends and characteristics of FDI and Vietnam's economy and industry, and (2) empirical analysis using industry-level panel data of 29 industrial sectors during 1995-1999 and 2000-2002 periods.

V.A. Le (2005)[19] applied both growth accounting approach and econometric techniques to FDI-growth nexus in Vietnam for the period 1986-2002. The causality test results seem to suggest that, FDI generates both significantly positive short-run and long-run impacts on economic growth in Vietnam.

In R. Jenkins (2006),[20] econometric techniques are also applied to investigate the impacts of FDI on employment in Vietnam. Despite the significant share of foreign firms in industrial output and exports, the direct employment generated has been very limited because of the high labor productivity and low ratio of value added to output of much of this investment. This study also shows that the indirect employment effects have been minimal and possibly even negative because of the limited linkage which foreign investors create and the possibility of "crowding out" of domestic investment.

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[19] V.A. Le (2005). "FDI-Growth Nexus in Vietnam", *Forum of International Development Studies* No. 31 (2006.02), Graduate School of International Development, Nagoya University.

[20] R. Jenkins (2006). "Globalization, FDI and employment in Vietnam". *Transnational Corporations*, Vol. 15, No. 1 (Apr/2006).

The overview of the studies on FDI in Vietnam shows that, relationship between outward FDI flows and exports has not been examined in details, especially for the period from 2003 to 2005 when a new increase of FDI flows to Vietnam has been observed. This motivates the research in this thesis which examines the relationship between outward FDI flows and exports in details in the case of Vietnam.

Chapter 3   FDI and Trade in Vietnam

This chapter provides a background description of FDI and trade in Vietnam. The objective is to illuminate the importance of FDI and trade for the economy and possibly find indications of a tentative relationship between FDI and exports.

3.1 Overview of FDI in Vietnam

Vietnam has been attracting many foreign investors with appropriate policies and abundant natural resources (as seen from table 3.1), and there turn into opportunities for Vietnam.

Vietnam has abundant natural resources named in Vietnamese as "golden forest and silver sea", including valuable resources such as oil, unexplored minerals in the sea; biological resources of its vast tropical forest, etc. Vietnam's climate makes many of there resources particularly attractive, permitting several crop per year, as well as high quantity agricultural and fishing products. Vietnam is now a major exporter of food and seafood in the world. Besides, people are Vietnam's greatest natural resource with the well-educated workforce with a literacy rate of 93%. Moreover, Vietnam also has a favorable access to large regional and international markets including Association South East Asian Nation (ASEAN), Asian Free Trade Area (AFTA), the United States, and European Union for export products. Vietnam has attempted to enter into the World Trade Organization (WTO) on Nov. 2006.

16

Table 3.1 Major macro economic indicator (2005)

Indicator (2005)	
Land area (square km)	311.69
Population (million people)	83.53
Literacy (percent)	93.00
Gross domestic product-GDP ($ billion)	35.00
GDP growth (percent)	7.50
GDP per capita ($)	564.00
Inflation (percent)	2.50
Natural resources:	Oil, gas, coal, iron, forest and sea's resources
Unemployment (percent)	5.60
Export ($ billion)	16.87
Principle export commodity:	Crude oil, rice, garment, marine products, coffee
Import ($ billion)	18.95
Principle import commodity:	Petroleum products, machinery, steel product, fertilizers

Source: General Statistic Office of Vietnam, 2006 and VVG-Economic Indicator, 2006

Vietnam attracts one of the highest levels of foreign investment amongst the ASEAN nations. FDI has helped to adjust the economic structure towards industrialisation and modernisation, develop production forces and enhance economic competitiveness and efficiency.

Table 3.2 Actual value of FDI in Vietnam, 1988 – 2005 ($millions)

Year	Number of Projects	Total registered Capital	Implemented Capital
1988	37	353	288
1989	69	525	312
1990	108	735	407
1991	151	1,275	664
1992	197	2,136	1,418
1993	274	2,589	1,469
1994	367	3,746	1,899
1995	408	6,848	3,157
1996	387	8,979	3,280
1997	358	4,894	2,404
1998	285	4,138	1,976
1999	311	1,568	693
2000	389	2,018	1,625
2001	550	2,592	1,044
2002	802	1,621	721
2003	748	1,900	933
2004	679	2,084	985
2005	798	4,003	2,125
Total	**6, 918**	**52,005**	**25,402**

Source: General Statistic Office, Ministry of Planning and Investment of Vietnam, 2006

FDI sector currently accounts for nearly 35% of the industrial output and has considerably contributed to the high growth of industrial production, more than 10% since 1990 (Ministry of Planning and Investment). Attracting foreign investment has been an integral part of the Vietnamese reform process since

1986. Since the Law on Foreign Investment (LFI) was issued in 1988, there has been a substantial inflow. According to the Ministry of Planning and Investment, from that time to 2005, the Vietnamese economy attracted total investment capital of about $52.005 billion with the total implemented capital of $25.402 billion (as seen table 3.2). With strong attractiveness to foreign investors, Vietnam is one of the fastest growing economies in the world with an expected average annual GDP growth of 7.5 percent for year 2004-2007 (Asian Development Bank, 2006).

During the years 1988 – 2005, Vietnam's economy was able to attract foreign investment in all sectors. The oil and gas sector was that FDI was most focused during the first half of the 1990s, and up to the end, it gained 8% of the total FDI in Vietnam. The industrial sectors accounted for the most important share of the capital inflows. According to table 3.3, through 1988 to 2005 the industrial sectors rapidly increase from $188 million in 1988 to $7,735 million in 1996, because Vietnamese government made favorable policies to attract foreign investors, moreover, Vietnam has abundant resources and labor. In this time, foreign investors significantly focused on discovering oil, gas, heavy industry and construction in 1996. However, the investment in there sectors significantly declined due to Asia crisis in 1997, they got only $2,175 million in 2000 and continued to increase to $2,388 million in 2005. The service sector absorbed the highest amount of FDI within the tertiary sector. The share of agriculture and forestry was only a small part of total, though it is slowly increasing (Table 3.3).

Table 3.3   Projects licensed in 1988 - 2005 by Sectors

Sector		Investment capital (in million dollar)				
		1988	1992	1996	2000	2005
I	**Industries & Construction**	**188**	**1,821**	**7,735**	**2,175**	**2,388**
	Oil & Gas	145	599	145	80	20
	Light Industry	12	201	387	364	642
	Heavy Industry	13	403	2,085	1,544	1,600
	Food Industry	2	109	590	178	80.4
	Construction	16	509	4,528	9	44.7
II	**Agriculture & Forestry**	**105**	**20**	**51**	**29**	**123**
	Agriculture & Forestry	96	13	39	21	107
	Fisheries	9	7	12	8	16
III	**Services**	**55**	**195**	**1193**	**348**	**1,491**
	Transportation & Telecom	39	40	719	231	681.6
	Hotels & Tourism	3	25	30	10	36.7
	Banking & Finance	1	140	96	40	50
	Health & Education	2	45	110	52	230
	Offices and Apartments	3	20	80	3	286
	Industrial Zones	4	10	16	26	26
	Others	8	15	142	26	180.7
Total		**353**	**2136**	**8979**	**2592**	**4,003**

Source: Ministry of Planning and Investment of Vietnam, 2006

FDI flow in Vietnam have been increasing annually, however, the distribution of investment projects into sectors is different in each year. Such as, the rate of foreign invested projects classified by sectors in 1988 (Figure 3.1) is

much more different than those in 2005 (Figure 3.2).

Figure 3.1 Investment in Vietnam 1988 by sectors
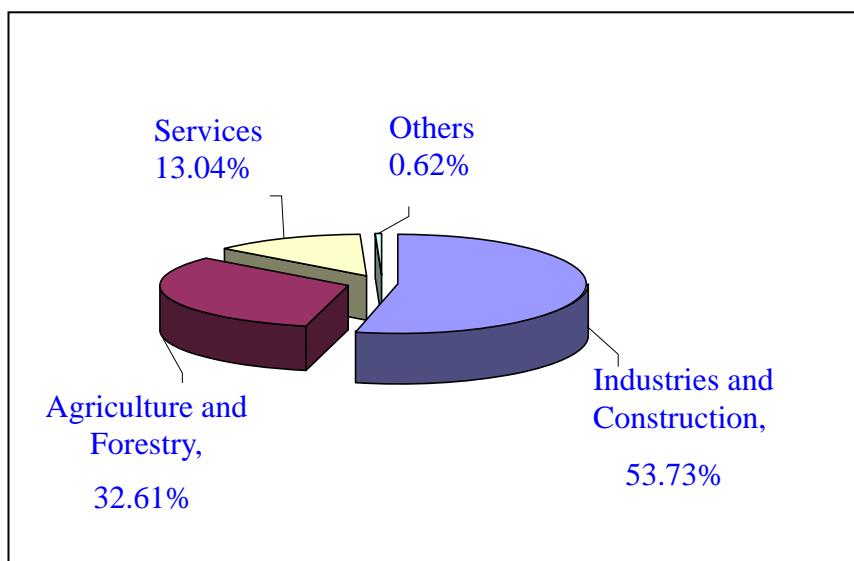
Source: Ministry of Planning and Investment of Vietnam, 2006

Figure 3.2 Investment in Vietnam 2005 by sectors

Source: Ministry of Planning and Investment of Vietnam, 2006

21
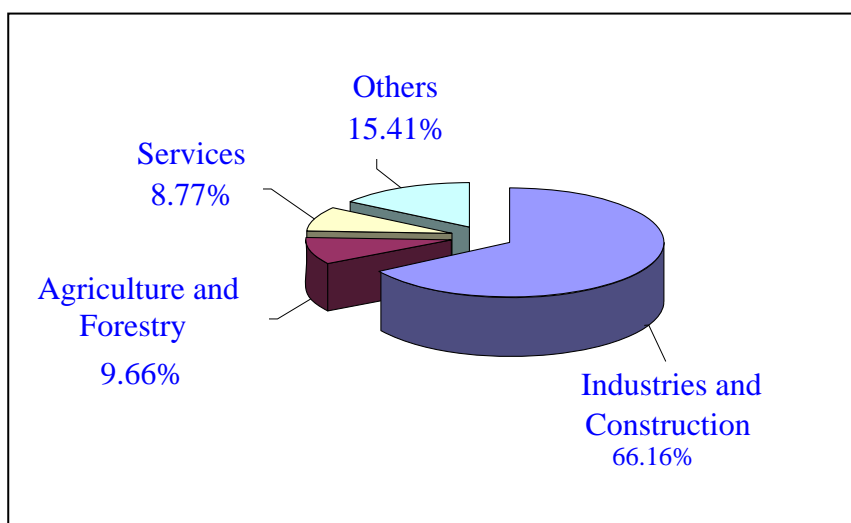
The industries and construction always lead all other sectors in influencing the economy accounting for 66.16% of total FDI. The services sector follows with 8.77%, agriculture and forestry sector gain 9.66% of total FDI, and other sectors gain 15.41% of total FDI (Foreign Investment Department - Ministry of Planning and Investment, 2006) (Figure 3.2). The share of these sectors in 1988 respectively is 53.73%, and 13.04%, and 32.61%, and 0.62%. In generally, the share of FDI flowing into heavy industry is still high, however, the light industry and service sectors increasing tendency in recent years. Vietnam is moving toward service and light industry with labor intensive foreign investment.

Since 1988 up to the end of 2005, investors from 75 countries and territories had invested in Vietnam, but Asian economies accounted for the major part of these capital flows. Taiwan is the principal foreign investor with 1,422 projects and $7,769 million of total investment capital. The second is Singapore with 403 projects and $7,610 million; followed by Japan with 600 projects and $6,289 million, and Republic of Korea with 1,064 projects and $5,338 million. The fifth is Hong Kong with 360 projects and $3,728 million. These top five investors account for 63.8 percent of total FDI commitments in the period 1988 – 2005. Countries of the Association of Southeast Asian Nations account for 25 percent of the total investment, mostly of Singapore's capital. However, after the signing in July 2000 of the US – Vietnam Bilateral Trade Agreement, investment from countries such as France, Netherlands, and United States has been increasing. Meanwhile, FDI from the United Kingdom is principally connected to investments of the 1990s in the oil and gas sector (ERD working paper No. 56) (Figure 3.3).

After the Vietnamese government introduced the Doi Moi (renovation) program and transferred from the central planning economy to the society-

oriented market economy, Vietnam has been attracting the foreign investment inflows from over 75 countries in the world which have contributed significant capital to economic growth. In 1988, Vietnam attracted only 37 projects with total investment capital of $353 million. However, in 1992, the government issued the first foreign investment law with favorable policies and with abundant natural and labor resources, the foreign investors have been increasing rapidly. Up to 2005, the projects are 798 with total capital of $4,003 million. According to figure 4, the foreign projects were invested mainly from Australia, France, United Kingdom and Russia with 33.43%, 17.58%, 12.18% and 6.52%, respectively in 1988.

Figure 3.3   Top 10 investors in Vietnam 1988 – 2005 (by capital)

Source: Ministry of Planning and Investment of Vietnam, 2006.

23
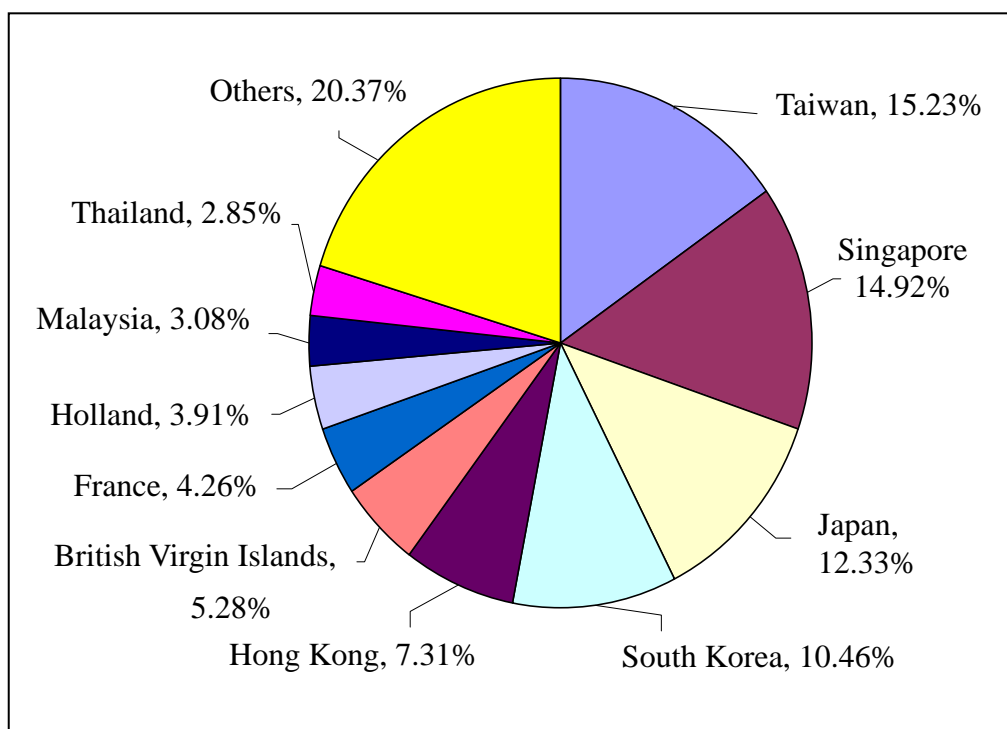
Difference from 1988, the main investors were Luxemburg, Samoa, South Korea, Hong Kong and Japan with 19.25%, 18.58%, 13.78%, 9.64% and 9.46%, respectively in 2005 (Figure 3.5), while in 1988 investment capital of Hong Kong, South Korea and Japan was only 2.83%, 1.13% and 0.28%, respectively.

Figure 3.4   Top 10 investors in Vietnam 1988 by countries
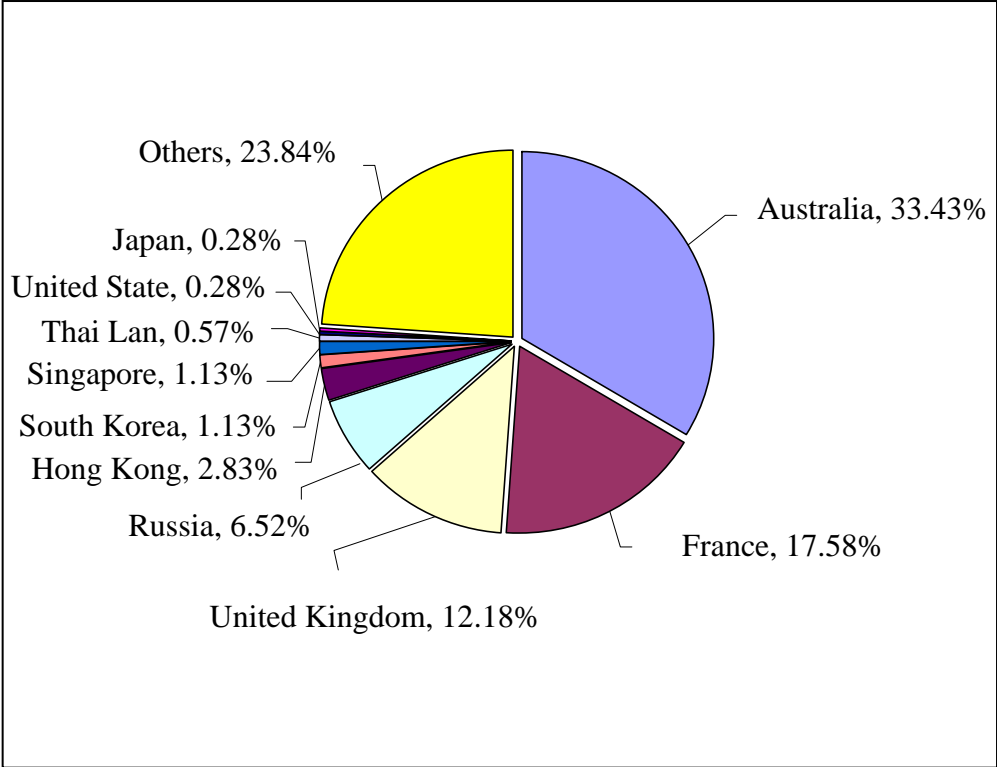
Source: *Ministry of Planning and Investment of Vietnam, 2006.*

Figure 3.5 Top 10 investors in Vietnam 2005 (by capital)
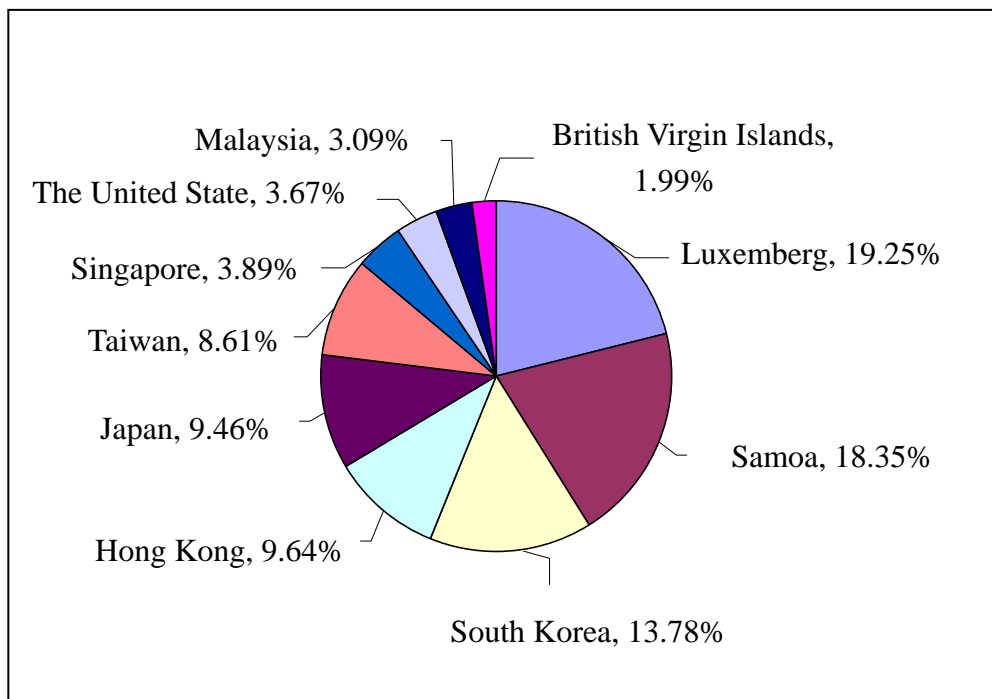
Source: *Ministry of Planning and Investment of Vietnam, 2006.*

All 61 provinces of Vietnam have attracted FDI but investors have so far located their investments mostly in urban areas where they can take advantage of more developed infrastructure. Ho Chi Minh City and Hanoi accounted for 23.54 and 17.92 percent, respectively, of the total FDI absorbed by Vietnam in 1988 – 2005. Apart from these two principal Vietnamese cities, other areas attracted high amounts of FDI, especially in southeast. The provinces of Dong Nai, Binh Duong, and Ba Ria Vung Tau absorbed another 31.59 percent of total FDI, far more than the other principal northern provinces of Hai Phong, Lam Dong, and Vinh Phuc. Central Vietnam attracted only a very modest amount of FDI. From these data, a result is that 81 percent of the total amount of FDI adsorbed by Vietnam in the last 17 years was invested in only five regions composing the Vietnamese state (table 3.4)

25

Table 3.4 Top 10 provinces selected by FDI in 1988 - 2005

Provinces	1988 - 2005			2005		
	No of Project	Total Capital ($mil.)	Percent (%)	No of Project	Total Capital ($mil.)	Percent (%)
Ho Chi Minh City	1,869	12,240	23.54	208	180	4.50
Hanoi	654	9,320	17.92	37	866	21.64
Dong Nai	700	8,495	16.34	30	278	6.95
Binh Duong	1,083	5,032	9.68	68	167	4.17
Ba Ria-Vung Tau	120	2,896	5.57	29	22	0.55
Hai Phong	185	2,034	3.91	17	25	0.62
Crude Oil Field	27	1,891	3.64	3	30	0.75
Vinh Phuc	95	774	1.49	18	37	0.92
Long An	102	766	1.47	12	24	0.60
Hai Duong	77	720	1.38	10	14	0.35
Others	2,006	7,836	15.07	366	2359	58.95
Total	**6,918**	**52,004**	**100.00**	**798**	**4,003**	**100.00**

Source: Ministry of Planning and Investment of Vietnam, 2006.

Vietnam's LFI considers some forms of investment and foreign investors are generally free to choose their modes of entry into Vietnam, such as business corporate contract (BCC), Joint ventures (JV), 100 percent foreign-invested company and build operate transfer (BOT), Stock company or capital management company (table 3.5). The LFI establishes that the BCC form must

be applied for investment in the sectors of oil and telecommunication, JV are required for a wide range of sectors such as transportation, tourism, culture, port construction, airport terminals, and explosive production. For projects regarding investment in the construction of infrastructure, such as water and electricity supply, the law requires build operate transfer contract to be signed with authorized state agency (Economics and Research Department - ADB).

Table 3.5 FDI by form of investment, 1988 – 2005 ($ million)

Form of investment	No of Projects	Investment capital	Percent (%)
100% foreign owned project	4,504	26,041	51.04
Joint ventures	1,327	19,181	37.60
Business cooperation contracts	184	4,171	8.17
Build-operate-transfer projects (BOT)	6	1,370	2.69
Others	9	254	0.50
Total	*6,918*	*52,005*	*100.00*

Source: Ministry of Planning and Investment of Vietnam, 2006.

However, in the early years of opening Vietnamese market door, the majority of FDI flows into Vietnam have been Joint ventures between foreign partners and state owned enterprises, which the latter usually contributes 20 to 30 percent of the values of the JV in term of values of land. Most of there investments are capital intensive, entered in oil-related production, heavy industry and real estate (building office for lease) (T.T. Do, 2005). The ratio of

100 percent foreign owned companies have been growing in recent years. In the first four month of 2005, there are 121 new register projects of which 100 percent foreign owned projects made up 72.8 percent, Joint Venture projects have 23.6 percent, and the remains are BOTs (T.T. Do, 2005).

3.2 Trends in FDI and Trade for Vietnam

In the past nearly 20 years of "Doi Moi", Vietnam has compiled remarkable accomplishments in trade. The average export growth rate of the period from 1986 to 2002 was 22.58%, with the absolute value of $789.07 million in 1986 to $16,706 mill. in 2002; an increase of roughly 20 times. At the same time, import volume increased by about 9 times, from $2,155.08 million to $19,745 million, at an average growth rate of 16.33%.

As shown in Figure 3.6, both export and import values increased remarkably since around 1993. This increase reflects the relaxation of state management in trade activities and the gradual progress in trade policy reforms. However, the growth of imports clearly overwhelmed the growth in exports.

During 1990-1992, the trade deficit was modest, averaging about USD40 million per year. The result was caused by an import-substitution policy and a floating exchange rate policy in the early 1990s. Since 1993, the trade deficit deteriorated, with imports increasing more rapidly than exports causing the trade deficit to expand rapidly during the mid-1990s; reaching a peak of 13.7% of GDP in 1996 (IMF, 1998). This was a result of the rapid growth of the economy and the rapid expansion of foreign direct investment. Foreign invested enterprises have a tendency towards capital intense production and must import some of these machines. The deficit was much lower in 1997 and 1998 because since the end of 1996 the government intensively used NTBs to dampen the pace of growth of imports. In 1999, trade deficits reduced closely to the external

balance. Since then, trade deficits moved to another higher cycle mainly due to the implementation of a demand-side policy to energize the slowing-down economy.

Figure 3.6   Export and import status in 1990-2005
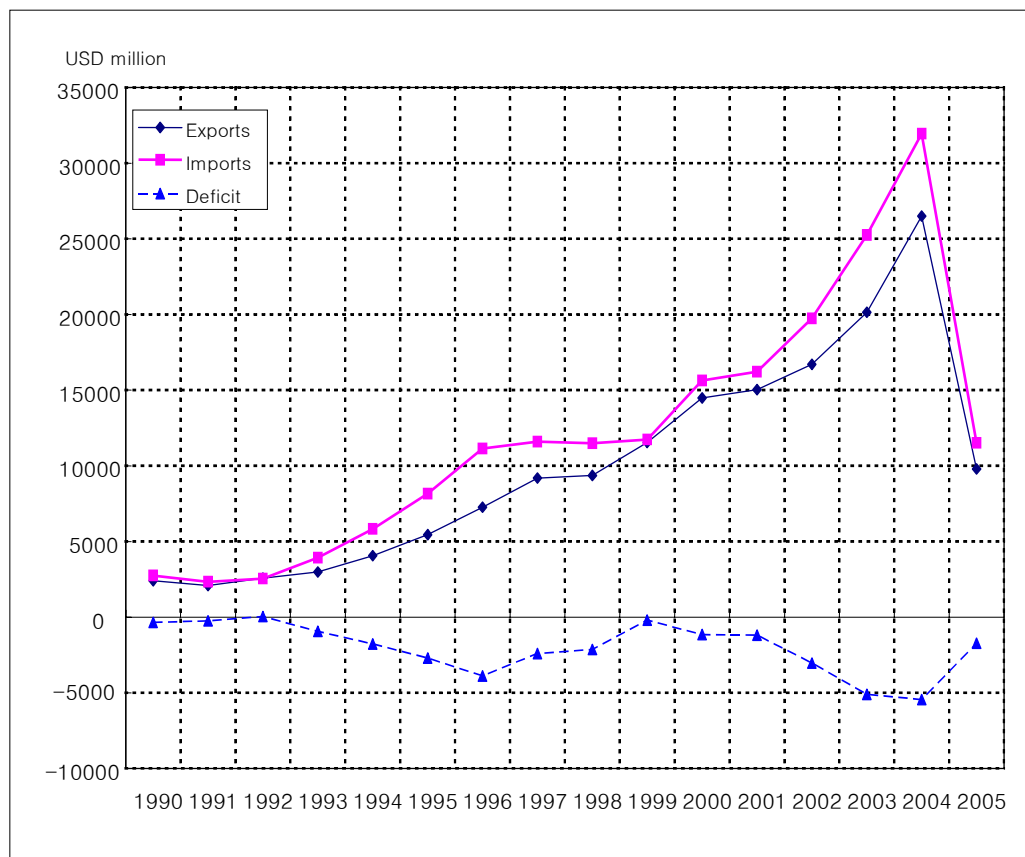
Source: General Statistics Office of Vietnam, 2006.

Foreign direct investment reached its highest levels on the eve of the Asian crisis, the contribution of FDI to GDP, exports, and total output has been characterized by a growing trend since the beginning of the 1990s. The contribution to GDP has doubled during the late 1990s from 6.3 % in 1995 to 13.3 % in 2000 and to 14.4 % in 2005 (Table 3.6).

29

Foreign direct investment also played an important role for export growth, especially after the Asian crisis. From 1996 to 1997, the foreign-invested sector's contribution to exports registered a growth rate higher than 80 percent, accounting for about 20 percent of exports. In 2000 it accounted for 23.2 percent of total exports and this value has increased during the recent years.

Table 3.6 Contribution of FDI to GDP and Export (Percent)

Year	Contribution to GDP	Contribution to Export
1995	6.3	8.1
1996	7.4	10.8
1997	9.0	19.5
1998	10.1	21.2
1999	12.3	22.4
2000	13.3	23.2
2001	13.7	23.8
2002	13.9	24.3
2003	14.1	24.9
2004	14.3	25.6
2005	14.5	25.9

Source: Ministry of Planning and Investment of Vietnam,2006.

Transnational corporations investing in Viet Nam during the last decade provided export market access; moreover, FDI has served as a catalyst for other domestic exporters. During 2002 the contribution of FDI to total exports was particularly relevant in some key industries such as footwear; textile and garments; and electronics, computers, and supplies. It accounted for 82 percent of the latter, 42 percent of footwear exports, and 25 percent of textile and

garments exports (ERD Working paper No. 56, p.10).

Table 3.7 FDI status in Vietnam

Unit: $mil.	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total investment	4,894	4,138	1,568	2,018	2,592	1,621	1,900	2,804	4,003
Revoked/ expired	568	2,447	785	1,796	1,437	1,138	1,784	n/a	n/a
Implemented	2,404	1,976	693	1,625	1,044	721	933	985	2,125
Turnover	3,955	4,380	5,711	7,921	9,800	12,261	15,000	18,000	22,000
Exports	1,790	1,982	2,590	3,320	3,673	4,602	6,341	8,601	9,789
Imports	2,890	2,668	3,382	4,350	4,984	6,704	8,815	10,970	11,517
FDI in state budget	315	317	271	324	373	459	628	800	985
Total employment*	250	270	296	379	450	590	686	739	820

* 1,000 people

Source: Ministry of Planning and Investment of Vietnam, 2006.

Table 3.7 shows contributions of foreign direct investment to state revenue, import, export, state budge and employment. We can find that the contribution of FDI to state turnover rapidly increases from $3,955 million in 1997 to $22,000 million in 2005. Between 1997 and 2000 foreign invested enterprises accounted on average for 5.7 percent of the state budget. If oil and gas revenues were included, FDI's contribution would account for over 20 percent. Besides, total employments also slowly increases in the last of the 1990s, however, they increase significantly in the early of the 2000s, from 250,000 in 1997 people to 820,000 people in 2005.

During the early 1990s, industrial output from foreign-invested enterprises accounted for less than 10 percent of total output, but increased decisively after 1995. In 2000 it accounted for about 35 percent of total industrial output, and was still achieving a growth rate higher than the state sector's. Before 1995, when foreign investment was concentrated in hydrocarbons, about 42 percent of the output of foreign-invested enterprises was in the mining sector. This percentage decreased during the following years, reaching 32 percent in 2000 as a consequence of the development of other sectors as targets of FDI.

Chapter 4   Empirical Analysis

This chapter presents a more formal analysis of the relationship between FDI and exports. Section 4.1 describes the data and presents the regression equation. Section 4.2 contains the test methodology, and Section 4.3 shows the empirical analysis presenting the results of unit root test and Granger causality test.

4.1 Descriptions of Data

Bilateral data would have been preferable when analyzing the relationship between FDI and exports allowing for a gravity approach using data for distance between the economies, their relative sizes with regard to GDP and bilateral FDI flows. This paper carries out time series estimations by using total exports as the dependent variable and total inflows and outflows of FDI as explanatory variables. All variables have been normalized according to population. This results in the following time series equation:

$$EXP_t = \beta_0 + \beta_1 FDI\text{-}in_t + \beta_2 FDI\text{-}out_t + \varepsilon_t \qquad (1)$$

where

- EXP_t represents total exports per capita in the period of t,

- $FDI\text{-}in_t$ is the inward flow of FDI per capita

- $FDI\text{-}out_t$ is the outward flow of FDI per capita

- ε_t is the disturbance term.

For almost of countries in the world, FDI flows have functions as an export-platform, therefore, β_1 should have a positive sign if these investments represent export-platform FDI. However, if market-seeking FDI dominates, FDI inflows should not affect host country exports. The sign of β_2 could be either positive or negative depending on whether outflows of FDI complement or substitute for source country exports.

Table 4.1 presents a description of the regression variables. Data are available for the period 1988 to 2005.

Table 4.1 Regression variables

Variable	Explanation	Data source	Expected sign for coefficient
EXP (*Dependent variable)*	Total exports per capita, USD	Based on trade data and population data from General Statistic Office (2006)	na
FDI-in *(Independent variables)*	Inward FDI flow per capita, USD	Based on inward FDI data and population data from General Statistic Office (2006)	+ (export platform FDI)
FDI-out *(Independent variables)*	Outward FDI flow per capita, USD	Based on outward FDI data and population data from General Statistic Office (2006)	+ (-) (Complement or Substitute)

From General Statistic Office of Vietnam, we can get the data of nominal Export, FDI inflows and FDI outflows from 1988 to 2005. And based on price level of 1988, we get the Real Export, FDI inflows and FDI outflows data (Table 4.2).

Table 4.2 The data of Export, FDI inflows, FDI outflows in million of dollars

Year	Nominal			Implicit Deflator		Real		
	Exp per capita	FDIin per capita	FDIout Per capita	FDI	Exp	Exp per capita	FDIin per capita	FDIout per capita
1988	14.95	5.45	0.06	100.0	100.0	14.95	5.45	0.06
1989	22.08	7.98	0.09	103.5	113.1	19.52	7.71	0.08
1990	31.30	10.93	0.32	114.9	103.5	30.24	9.51	0.27
1991	25.99	18.54	0.58	119.2	100.4	25.88	15.55	0.49
1992	32.38	30.34	0.75	102.6	96.6	33.52	29.57	0.73
1993	37.30	35.97	0.10	119.8	98.9	37.72	30.02	0.08
1994	51.75	51.64	0.18	125.3	104.4	49.57	41.21	0.14
1995	70.08	93.20	0.19	129.5	93.2	75.19	71.97	0.15
1996	93.55	120.76	0.31	134.4	100.7	92.90	89.87	0.23
1997	117.35	64.64	0.45	142.9	109.3	107.37	45.22	0.32
1998	118.40	54.08	0.24	146.6	112.0	105.71	36.90	0.16
1999	145.02	20.23	1.59	150.6	113.9	127.32	13.43	1.06
2000	180.05	32.90	0.87	162.5	145.6	123.66	20.25	0.54
2001	184.25	25.24	0.96	168.7	148.7	123.91	14.96	0.57
2002	204.00	20.16	22.49	169.8	159.2	128.14	11.87	13.24
2003	243.91	23.35	3.36	202.6	171.2	142.47	11.52	1.66
2004	316.26	25.25	1.40	223.5	176.4	179.29	11.30	0.63
2005	381.13	47.78	20.11	248.7	181.2	210.34	19.21	8.08

Source: General Statistic Office of Vietnam, 2006.

36

According to table 4.2, it is shown that the difference between variables of Export, FDI inflows and FDI outflow at current price and the variables of Export, FDI inflows and of FDI outflow at constant price 1988 are not so large, although the price increases annually. From figures 4.1, 4.2, 4.3, we can compare the difference between nominal and real variables.

Figure 4.1 Nominal and Real Export from 1988-2005
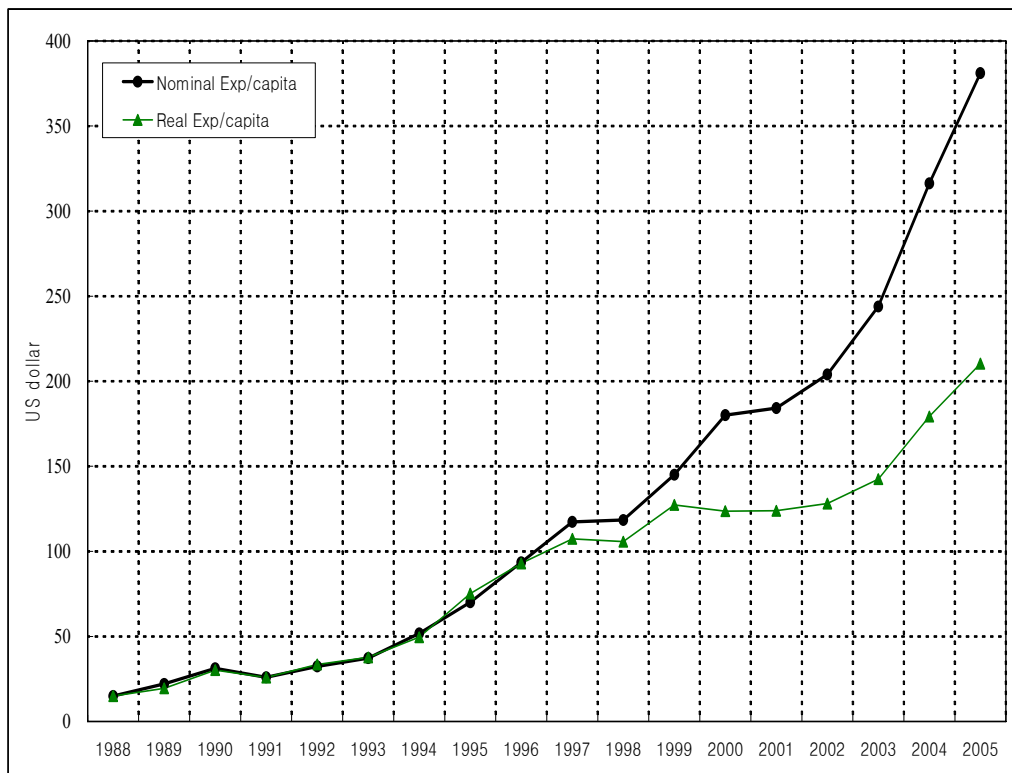
Source: General Statistic Office of Vietnam, 2006.

Figure 4.2 Nominal and Real FDI inflows from 1988-2005
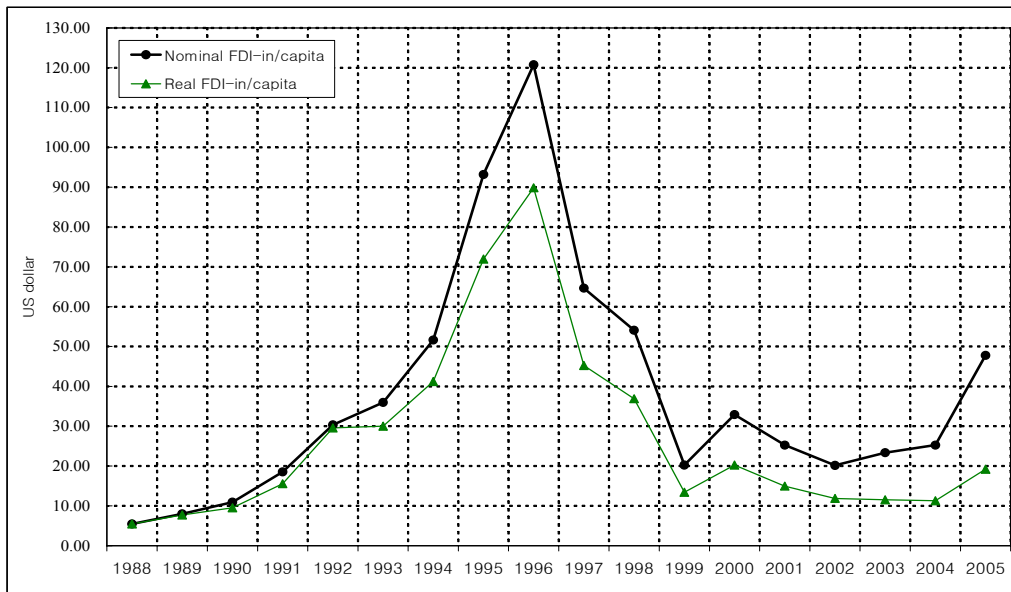
Source: General Statistic Office of Vietnam, 2006.

Figure 4.3 Nominal and Real FDI outflows from 1988-2005
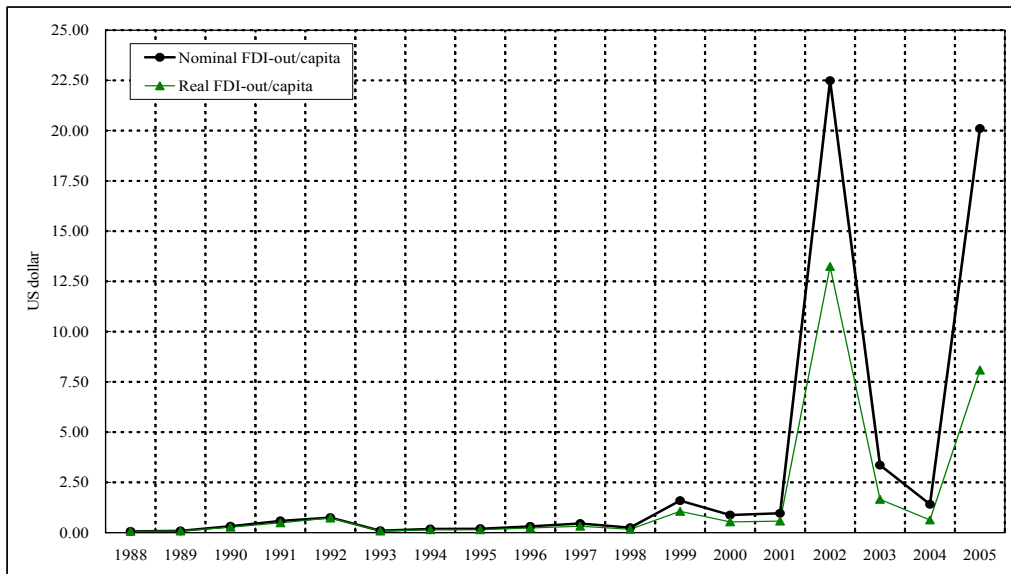
Source: General Statistic Office of Vietnam, 2006.

4.2 Test Methodology

4.2.1 Unit root test

Empirical work based on time series data assuming that the underlying time series is stationary. The stationary of time series is very important, because if a time series is nonstationary, we can study its behavior only for the time period under consideration. Therefore, each set of time series data will be for a particular episode. As a consequence, it is not possible to generalize it to other time periods, thus, for purpose of estimation, such nonstationary time series may be of little practical value. The Granger causality test also assumes that the time series involved in analysis are stationary.

Therefore, tests of stationary should precede test of Granger causality. And, in order to know whether a particular time series is stationary, we apply a test of stationary that has become widely popular over the past several years, it is called *Unit root test*.

First, we start from unit root stochastic process.

$$Y_t = \rho Y_{t-1} + u_t \quad (-1 \leq \rho \leq 1) \tag{2}$$

This model resembles the Markov first-order autoregression model.

If $\rho = 1$, (2) becomes a Random walk model (without drift), and we face

what is known as the unit root problem, that is a situation of nonstationary. We know that in this case the variance of Y_t is not stationary. The name unit root is due to the fact that $\rho = 1$. Therefore, the terms nonstationary, random walk, and unit root can be treated as synonymous.

If $|\rho| \leq 1$, it mean that if the absolute value of ρ is less than one, then it can be shown that the time series Yt is stationary.

For theoretical reasons, we manipulate (2) as follows: subtract Y_{t-1} from both sides of (2) to obtain:

$$
\begin{aligned}
Y_t - Y_{t-1} &= \rho Y_{t-1} - Y_{t-1} + u_t \\
Y_t - Y_{t-1} &= (\rho - 1) Y_{t-1} + u_t
\end{aligned}
\tag{3}
$$

this can be alternatively written as:

$$
\Delta Y_t = \delta Y_{t-1} + u_t
\tag{4}
$$

where $\delta = (\rho - 1)$ and Δ, as usual, is the first difference operator.

Therefore, instead of estimating (2), we estimate (4), and test the null hypothesis ($\delta = 0$). If $\delta = 0$, then $\rho = 1$, we have a unit root meaning the time series is nonstationary. In order to estimate (4), we take the first differences of Y_t and regress them on Y_{t-1}, and see if the estimated slope coefficient in this regression ($= \hat{\delta}$) is zero or not. If $\hat{\delta} = 0$, then, Y_t is nonstationary; if $\hat{\delta} < 0$,

we conclude that Y_t is stationary (*Because $\delta = (\rho - 1)$, for stationary ρ must be less than one, thus, δ must be negative*).

Dickey and Fuller (DF) have shown that under the null hypothesis that $\delta = 0$, the estimated t value of the coefficient of Y_{t-1} follows the τ (tau) statistic. The DF test is estimated in three different forms, that is, under three different null hypotheses.

Y_t is a random walk
$$\Delta Y_t = \delta Y_{t-1} + u_t \qquad (4)$$

Y_t is a random walk with drift
$$\Delta Y_t = \beta_1 + \delta Y_{t-1} + u_t \qquad (5)$$

Y_t is a random walk with drift around a stochastic trend
$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + u_t \qquad (6)$$

In conducting the DF test, it was assumed that the error term u_t was on correlated. But in case the u_t is correlated, DF has developed a test, known as the augmented Dickey-Fuller (ADF) test. This test is conducted by "augmenting" the preceding three equations by adding the lagged values of the dependent variable ΔY_t. The ADF test consists of estimating the three following regressions:

Y_t is a random walk:
$$\Delta Y_t = \delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i Y_{t-i} + u_t \qquad (7)$$

Y_t is a random walk with drift:
$$\Delta Y_t = \beta_1 + \delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i Y_{t-i} + u_t \qquad (8)$$

Y_t is a random walk with drift around a stochastic trend:
$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-i} + u_t \qquad (9)$$

41

where,   - Y_t is the time series being investigated for nonstationary

- t is the time measured by time chronologically

- u_t is the error term

- m is the number of lagged difference terms

Figure 4.4 FDI flows and exports status
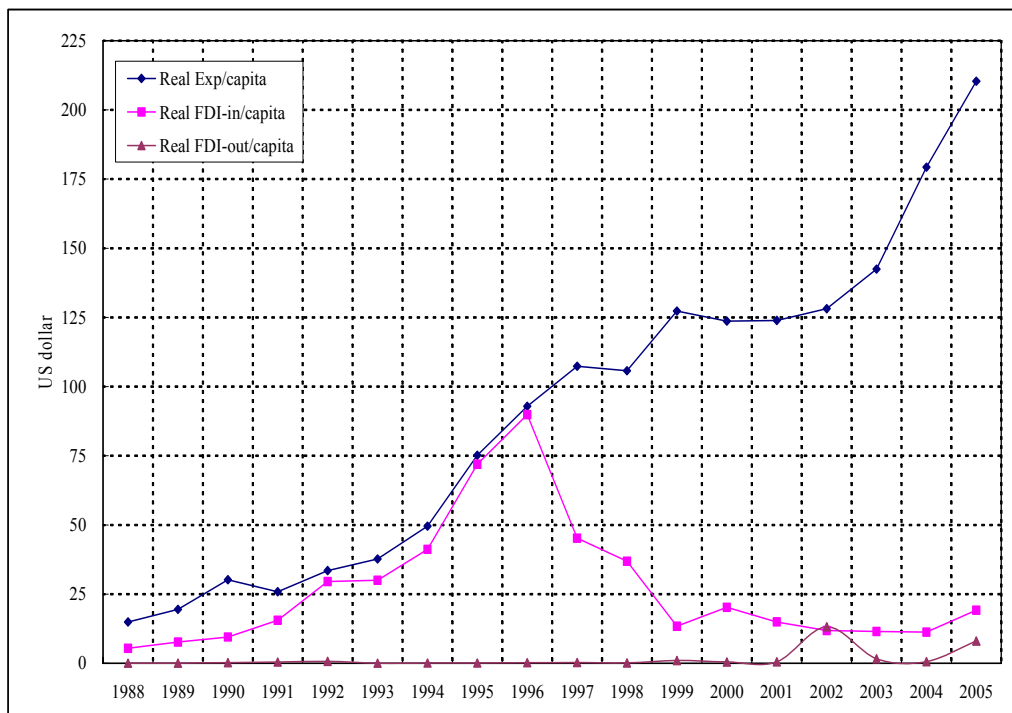
Source: General Statistics Office of Vietnam, 2006.

FDI and trade have played an importance role for Vietnamese economy in the past decades. There have been large inflows of FDI and at the same time the volume of exports has increased. This suggests a potential nonstationary

problem. Performing regressions on nonstationary time series can result in spurious regression. It is therefore necessary to try to determine whether the data is stationary or not.

4.2.2 Granger Causality Test

Granger causality test is used to apply to estimate the relationship between two or more different variables. A basic principle related to a check of cause and effect of Granger test is that: When regress to other variables of Y is done; when it is possible to include the variable at which lagged X and to improve a prediction to Y remarkably. Thus, X is granger cause of Y, and Y is granger cause of X.

We have the following pair of regressions model:

$$Y_t = \sum_{i=1}^{n} \alpha_i X_{t-i} + \sum_{j=1}^{m} \beta_j Y_{t-j} + u_{1t} \tag{10}$$

$$X_t = \sum_{i=1}^{n} \alpha_i X_{t-i} + \sum_{j=1}^{m} \beta_j Y_{t-j} + u_{1t} \tag{11}$$

Equation (10) presents that X causes Y, and equation (11) shows that Y causes X. The null hypothesis is H_0: $\Sigma \alpha_i = 0$. The direction of causality suggested by the Granger causality test is sensitive to the number of lags which are used. Therefore, this paper performs all Granger causality tests for one, two

43

and three lags. Since there are a limited number of observations available, it does not seem reasonable to use more than three lags.

+) The null hypotheses of Granger Causality test are:

H_0: $X \not\Rightarrow Y$ (X does not Granger-cause Y)

H_1: $X \Rightarrow Y$ (X does Granger-cause Y)

To test this hypothesis, we apply the F test as follows:

$$F = \frac{(ESS_0 - ESS_1)/m}{ESS_1/(n-k-m-1)}$$ where ESS is residual sum of squares

If the calculated F value exceeds the critical F value at the chosen level of significance, we reject the null hypothesis ($H_0 = 0$).

If export-platform FDI indeed is important for the Vietnamese economy, FDI inflows should result in an increase in export flows from the host country. Granger causality tests can be used to analyze this. In general, the idea of Granger causality is that while past events can cause current events, future events cannot cause current events. In this case, we want to examine whether FDI inflows Granger-cause export flows. The Granger causality test therefore involves estimating the following two regressions:

$$FDIIN_t = \sum_{i=1}^{n} \alpha_i EXP_{t-i} + \sum_{j=1}^{m} \beta_j FDIIN_{t-j} + u_{1t} \qquad (12)$$

$$EXP_t = \sum_{i=1}^{n} \lambda_i EXP_{t-i} + \sum_{j=1}^{m} \delta_j FDIIN_{t-j} + u_{2t} \qquad (13)$$

Similar to two regression equations of Exports and FDI outflows.

4.3 Empirical Analysis and Results

In this section, the Ordinary least squares (OLS) is applied to determine coefficients of time series regressions for Vietnamese economy using the data provided by General Statistics Office of Vietnam (GSO).

4.3.1 Results of time series regression

By applying Eviews software, we can get coefficient of equation (1) presented in table 4.4. We rewrite equation (1) as follows:

$$EXP_t = 73.28 + 0.16\ FDI\text{-}in_t + 8.09\ FDI\text{-}out_t \qquad (1')$$

$$R^2 = 0.22 \qquad d = 1.58$$

Table 4.3 shows that the coefficients are highly statistically significant, and although the R^2 value is low, it is statistically significantly different from zero. From these results, we can conclude that there is a significant statistical relationship between Export and FDI flows. The coefficient for both of FDI-IN

and FDI-out has a positive sign for Vietnamese economy. The results of Table 4.3 suggest that FDI inflows tend to increase total exports and FDI outflows can function as a complement for exports in trade. The indications of a positive effect from FDI flows support an export-platform FDI in Vietnamese economy.

Table 4.3 Time series regressions

Dependent variables			Export
Sum of squared errors			44297.72
Standard error of the regression			54.34
R-squared			0.22
Adjusted R-squared			0.12
Durbin-Watson (d)			0.58
F-statistic			2.14
Number of observations			18
Degree of freedom			15
	Constant	**FDI-in**	**FDI-out**
Coefficients	73.28	0.16	8.09
Standard error of coefficients	23.91	0.40	4.55
t-statistic	3.06***	0.40	1.78**

(*The symbols *, **, *** are significance at 0.1, 0.05, and 0.01 level, respectively*)

In order to compare with other countries, we refer to the findings of A. Johnson (2006). For Singapore, Taiwan, China and Korea, FDI inflows are found to have a significant positive effect on total exports, but in Thailand inflows have a significant negative effect on total exports. However, the results are more mixed for FDI-out variable. China and Singapore have a significant negative effect of FDI outflows on exports, and Korea and Taiwan have a significant positive effect. In short, similar to Vietnamese economy, the findings of A. Johnson (2006) suggest that FDI inflows also tend to raise total exports while FDI outflows can substitute or complement for exports but the support is not very strong. The indications of positive effect from FDI inflows support the idea of export-platform FDI in these countries.

4.3.2 Unit root test results

Figure 4.4 suggests that the export variable is likely to be nonstationary and possibly also the FDI inflows variable. A more formal analysis of the existence of nonstationary involves performing a unit root test.

Accordingly, the augmented Dickey-Fuller (ADF) test is performed on the individual time series for Vietnamese economy. The ADF-test consists of estimating the regression equations (7), (8), (9). The null hypothesis is that $\delta = 0$, implying the existence of a unit root and a nonstationary time series. The Schwarz information criterion is used in order to determine the number of

lagged difference terms. To be specific, suppose that we use (9),

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-i} + u_t \qquad (9)$$

By using Eviews 5.0 software, we have the results for the ADF test presented in Table 4.4 as follows:

Table 4.4 Unit root test for regression variables in level

Observations =13, lag =3

ADF test	Export	FDI-in	FDI-out
δ estimate	0.16	-1.076	-3.819
t value	1.29	-1.45*	-1.365

The symbols *, **, *** are significance at 0.1, 0.05 and 0.01 level, respectively.

Table 4.4 indicates that the hypothesis of nonstationary for the various regression variables can not be rejected, especially the export variable. We can see that, the time series of export is nonstationary with $\delta > 0$ (according to theory of unit root test above mentioned). Moreover, the t value in absolutely value is smaller than the critical t value. Therefore, we can conclude that the time series of export and FDI-out is nonstationary in level.

To avoid the problem of spurious, the time series have to be transformed to make them stationary. Consequently, we take the fist differences of the time

series and the ADF test is rerun. Table 4.5 shows the results of ADF test on the data in first difference form.

$$\Delta(\Delta Y_t) = \beta_1 + \beta_2 t + \delta \Delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta(\Delta Y_{t-i}) + u_t \qquad (9')$$

Table 4.5 Unit root test for regression variables in first difference

Observations =12, lag =3

ADF test	Export	FDI-in	FDI-out
δ estimate	-1.507	-2.417	-5.819
t value	-2.893**	-2,756**	-1.696*

The symbols *, **, *** are significance at 0.1, 0.05 and 0.01 level, respectively.

In summary, we can see that according to ADF test in first difference, t values in absolute terms are larger than critical value at high significant level, therefore, we can reject hypothesis of zero ($H_0 = 0$). In other word, Export, FDI-in and FDI-out are stationary time series in first differences form.

Comparing with China and Indonesia, FDI and Export flows of Vietnam are relatively stationary. The time series of FDI inflow of Vietnam is stationary in level form at 10% significance level, and the time series of FDI outflows and export become stationary in first difference form, while the time series for Chinese and Indonesian exports flows and FDI inflows were still nonstationary

49

even in first difference form (A. Johnson, 2006).

4.3.3 Granger Causality test results

By using the Eviews software, we can get the results of Granger causality test as follows:

Table 4.6 Granger causality tests Real export, real FDI-in and FDI-out with lags equal to 1, 2, 3

Lags: 1

Null Hypothesis:	Obs	F-Statistic	Probability
FDI_IN does not Granger Cause EXP	16	6.029**	0.011
EXP does not Granger Cause FDI_IN		2.724	0.118
FDI_OUT does not Granger Cause EXP	16	4.285**	0.033
EXP does not Granger Cause FDI_OUT		3.558*	0.062

*The symbols *, **, *** are significance at 0.1, 0.05 and 0.01 level, respectively*

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
FDI_IN does not Granger Cause EXP	15	7.269***	0.006
EXP does not Granger Cause FDI_IN		3.494**	0.045
FDI_OUT does not Granger Cause EXP	15	5.564**	0.021
EXP does not Granger Cause FDI_OUT		1.448	0.278

*The symbols *, **, *** are significance at 0.1, 0.05 and 0.01 level, respectively*

Lags: 3

Null Hypothesis:	Obs	F-Statistic	Probability
FDI_IN does not Granger Cause EXP	14	6.649***	0.008
EXP does not Granger Cause FDI_IN		2.874*	0.084
FDI_OUT does not Granger Cause EXP	14	5.614**	0.017
EXP does not Granger Cause FDI_OUT		1.908	0.191

*The symbols *, **, *** are significance at 0.1, 0.05 and 0.01 level, respectively*

Table 4.7 The critical *F* value at significant level

Significant level	Lag = 1	Lag = 2	Lag = 3
10%	2.73	2.54	2.67
5%	3.74	3.36	3.58
1%	6.51	5.67	6.37

Comparing the F value with the critical F value, we can conclude as follows:

Table 4.8 Results of Granger causality test with **lag = 1**

Variable	Granger causality		
	10%	5%	1%
Real FDI-in → Real Export	**YES**	**YES**	**NO**
Real Export → Real FDI-in	NO	NO	NO
Real FDI-out → Real Export	**YES**	**YES**	NO
Real Export → Real FDI-out	**YES**	NO	NO

Table 4.9 Results of Granger causality test with **lag = 2**

Variable	Granger causality		
	10%	5%	1%
Real FDI-in → Real Export	**YES**	**YES**	**YES**
Real Export → Real FDI-in	**YES**	**YES**	NO
Real FDI-out → Real Export	**YES**	**YES**	NO
Real Export → Real FDI-out	NO	NO	NO

Table 4.10 Results of Granger causality test with **lag = 3**

Variable	Granger causality		
	10%	5%	1%
Real FDI-in → Real Export	**YES**	**YES**	**YES**
Real Export → Real FDI-in	**YES**	NO	NO
Real FDI-out → Real Export	**YES**	**YES**	NO
Real Export → Real FDI-out	NO	NO	NO

From tables 4.8, 4.9, 4.10, it is shown that FDI inflows does Granger cause Export for all three lags. However, Export and FDI inflows are independent with each other for the first lag but for the latter lags, Export does Granger cause FDI inflows strongly at three significance level 10%, 5% and 1%. Because Vietnam is developing country with low average income level and abundant labour, thus, many developed countries have invested into Vietnam

and have constructed some factories with objective reducing production costs and increasing the volume of exports, primarily on the intermediate goods. Therefore, with this result of Granger causality test, FDI inflows have strong complement relationship with export. It implies the export-platform FDI for Vietnamese economy.

Similar to FDI inflows, FDI outflows also Granger cause Export for three lags. However, Export only Granger cause FDI out for first lag, and Export and FDI outflows are independence for latter lags. According to this result, FDI outflows also have the complement relationship with Export but it is not very strong. Because, FDI outflows of Vietnam into foreign countries are not large, mainly focus the investment on developing countries where also have abundant resources and labour such as Laos, Cambodia, Malaysia, Indonesia, etc. The Vietnamese enterprises want to locate production close to the market of third country in order to reduce shipping cost, trade cost and increase the volume of export contributing significantly to development of Vietnamese economy.

In A. Johnson (2006), the author studied the natural of relationship between FDI and Exports for eight economies in East Asia such as China, Hong Kong, Indonesia, Korea, Malaysia, Singapore, Taiwan and Thailand. He concluded that the inflows of FDI tend to have a positive effect on the exports of these countries, possibly due to MNEs performing export-platform FDI. However, for the case of FDI outflows, the effect of FDI outflows on the exports is mixed,

54

suggesting that FDI outflows can constitute both complements and substitutes to exports. Vietnam also has the complement relationship between FDI and Export flows as suggested by the theoretical literature. It is not so different from the East Asian Economies.

Summarizing the results of the Granger Causality test, there are indications that FDI inflows and FDI outflows tent to Granger-cause export providing further evidence for export-platform FDI in Vietnamese economy. It means that there is a complement relationship between FDI flows and exports for Vietnamese economy. Therefore, FDI flows should be encouraged by Vietnamese Government to be able to take advantage absolutely the usefulness of FDI for the economic growth in Vietnam.

Chapter 5 Conclusions

Since 1986, Vietnamese government introduced the Doi Moi (renovation) program and economic reforms, and started its transition from a centrally planned economy to a socialist-oriented market economy. The Vietnamese government issued the first edition of Law of Foreign Investment in 1988 with favorable policies. With the advantages of resources, climate and people, Vietnam has been attracting a large source of capital from foreign investors, contributing significantly to economic growth, export, employment and poverty reduction. Many economists argue that the FDI flows could fill the gap between foreign investments and domestically mobilized saving. It also may increase tax revenue and improve management, technology, as well as labor skill in host countries. FDI may help the host country to break out of the vicious cycle of underdevelopment. Additionally, FDI always has positive relationship with trade, export-orientation and FDI inflows has provided main contributions to increase in income level and FDI have become important for Vietnamese economy.

This thesis aims to investigate the relationship between FDI flows and exports on the macroeconomic level for the Vietnamese economy in the period 1988-2005. By using some analyzing methods of test such as Unit root test, Causality test, the thesis determines the stationary of time series and causality relationship between FDI flows and export for Vietnamese economy. The Eviews 5.0 software is used to calculate the results of tests.

Unit root test is to determine stationary in the time series data and the time series are transformed to first difference form. The results of Unit root test are shown that the time series of FDI and Export for Vietnam are relatively stationary comparing with other countries such as China or Indonesia (as mentioned in chapter 4). Besides, the time series regressions provide the implication of a positive effect of FDI flows on exports of Vietnam, suggesting the export-platform FDI flows for Vietnam. The results of Granger causality test indicate that FDI flows Granger cause Export flows and Exports also Granger cause FDI flows, however, the effects of FDI-in and FDI-out on Exports are larger than these of Exports on FDI flows. It means that FDI flows tend to increase Export for Vietnam, and it shows the presence of export-platform FDI or a complement relationship between FDI and Export in the Vietnam economy as suggested by the theoretical literature.

The results of this thesis suggest that FDI flows tend to increase exports which have contributed significantly to economic growth. Thus, FDI flows

should be encouraged by attracting policies, improving the skill for labor forces. Additionally, FDI flows can create employment, increase in the income level and the standard of living in developing country as Vietnam.

However, besides the findings, this thesis also has some limitations. The data of FDI flows and Export have not been available for the period before 1988. Thus, this thesis only focuses the study on the period 1988-2005. An eighteen-year period is not very long to be able to obtain the absolute results for the relationship between FDI and export. Moreover, FDI is very important not only to export but also to employment, income, education, infrastructure, etc. Within the limit of this thesis, we only focus on the causality relationship between FDI and export which has contributed significantly to the growth of Vietnamese economy. By applying some econometric models, this thesis has found the complement relationship between FDI flows and Export and the importance of FDI to Export in Vietnamese economy.

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