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across provinces**

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**FOREIGN DIRECT INVESTMENT IN VIETNAM:
AN OVERVIEW AND ANALYSIS THE DETERMINANTS
OF SPATIAL DISTRIBUTION ACROSS PROVINCES**

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FOREIGN DIRECT INVESTMENT IN VIETNAM: AN OVERVIEW AND ANALYSIS THE DETERMINANTS OF SPATIAL DISTRIBUTION

Nguyen Ngoc Anh and Nguyen Thang

Abstract: Vietnam has been quite successful in attracting FDI inflows since the inception of economic reform in 1986. The inflow of FDI has contributed significantly to the economic development of Vietnam. Still, the determinants of FDI inflow and its impacts on the economy of Vietnam are under-researched. In this paper we provide an overview of foreign direct investment (FDI) in Vietnam and attempt to review of the current status of economic research on the determinants of FDI and its impacts on the economy of Vietnam. Our regression analysis of the determinants of FDI spatial distribution across provinces points to the importance of market, labour and infrastructure in attracting FDI. Government policy as measured by the Provincial Competiveness Index (PCI), however, does not seem to be a significant factor at the provincial level. Foreign investors from different source countries seem to behave differently in choosing the location of investment.

Keywords: Foreign Direct Investment, Vietnam, multinationals, spatial distribution,

I. INTRODUCTION¹

In 1986, after a long endurance of economic hardship, Vietnam embarked on a path of reform, known as "doi moi", a comprehensive change by restructuring the economy from a planned economy to a market economy. Since then, the Vietnamese economy had shown a remarkable performance as one of the fastest growing economies in the world. With the average GDP growth rate at over 7 percent per year, the living standard has improved substantially. The poverty rate fell from 58.1 percent in 1993 to 22.0 percent in 2005 (ADB 2006). GDP per capita increased from US\$ 100 in 1990 to over US\$ 700 in 2006. Total gross domestic product increased from US\$ 15 billion to over US\$ 53 billion in 2005. Annual inflation fell from 774 percent in 1986 to 67.5 per cent in 1990, 12.7 per cent in 1995, and 8.8 percent in 2005 and around 7.5 percent in 2006.²

Vietnam has witnessed during its transition to the market oriented economy two important developments. Vietnam's international trade has increased substantially and Vietnam has managed to attract a large inflow of inward foreign direct investment (FDI) during the last two decades. These two developments have been considered as important source of economic growth of Vietnam (Le Dang Doanh 2002, Dollar 1996; Dollar and Kraay 2004). According to official statistics released from the Ministry of Planning and Investment (MPI), by March 2007, Vietnam has received a total of 7067 foreign direct investment projects with the total investment capital of US\$ 63.5 billion (of which the legal capital is US\$ 27.7 billion and the implemented capital is US\$30.7 billion).

¹ In parallel papers, we investigate (i) the spillover effects of FDI on Vietnamese enterprises and (ii) poverty reduction of FDI in Vietnam.

² Source: http://www.vvg-vietnam.com/economics_cvr.htm and <http://www.imf.org/external/pubs/ft/scr/2006/cr06422.pdf> access 2 May 2007

According to recent research, the achievement of Vietnam to attract FDI inflow is spectacular. Vietnam has become an attractive host country, overtaking Philippines and Indonesia to become the third largest recipient of FDI inflows in the ASEAN behind Singapore and Malaysia (Mirza and Giroud 2004). Several country-specific advantages have been pointed out as the main factors allowing Vietnam to attract such a large amount of FDI. They include (i) Vietnam's strategic location in a rapid growing region, allowing Vietnam to be part of the growth process; (ii) Vietnam's stable economic and political environment; (iii) Vietnam's large natural mineral resources; (iv) Vietnam's abundant, young and relatively well-educated labour force³; (v) Vietnam's large and growing domestic market; (vi) Vietnam's potential to be an export platform for EU and US market; and (vii) Vietnam's liberal investment and government's commitment to economic reform.⁴

A FDI inflow into Vietnam is widely believed to benefit the economy in terms of investment capital, technology transfer, management skills, and job creation. Accordingly, there has been an increasing number of research on the impacts/contribution of FDI to economic growth, poverty reduction, industrial upgrading. Consistent with the fact that the studies on FDI flows are considerably behind the trade literature as pointed out by Blonigen (2005), although there is now a large body of research on the link between trade liberalization and growth and poverty reduction in Vietnam, the

³ However, the industrial working discipline of the workforce has been highlighted as a problem.

⁴ See Pham (2003) and Mirza and Giroud (2004) for further discussion. In a recent study, Runkel (2005) compared the costs of doing business for foreign investors in Vietnam, Thailand and China. The author finds that although Vietnam still cannot compete fully with these two neighbouring countries, the difference has been narrowed down significantly and Vietnam should be considered as an alternative investment site for these two countries.

determinants of FDI and its impacts on the economy of Vietnam are still under-researched.⁵

In this context, this paper is one among several papers written in parallel to provide a systematic study on the determinants of FDI and its potential impacts on the economy of Vietnam. The main purpose of this paper is to collect and review FDI related papers on Vietnam and to provide an updated analysis of the determinants of spatial distribution of FDI across provinces in Vietnam during 1988-2006. In this paper, we go a step further by examining the determinants of FDI spatial distribution by source countries. We expect that the purpose and locational consideration of inward FDI from different countries may vary.

This paper is structured in five sections. Section II provides a brief overview of the development of foreign direct investment in Vietnam since the beginning of the economic reform while Section III examines the business environment for foreign investors in Vietnam. Section IV review previous studies on issues related to FDI, ranging from determinations of FDI and its impacts. Section V investigates the locational determinants of FDI in Vietnam. Section VI concludes our paper.

⁵ See Nguyen Thang (2004) and Winters et al (2002) and reference cited therein for the literature on trade liberalisation and its impacts in Vietnam.

II. AN OVERVIEW OF FDI IN VIETNAM

2.1 Inflow of Foreign Direct Investment

As a later comer as compared with other countries in the region, foreign direct investment (FDI) in Vietnam has a relatively short history of development. In 1987, Vietnam for the first time issued its ever first Law on Foreign Direct Investment. Despite its relative short history, Vietnam has managed to attract a substantial amount of FDI. In relative term, Vietnam has been quite successful as compared with other countries, ranking the third largest recipient in the ASEAN (Mirza and Giroud 2004).

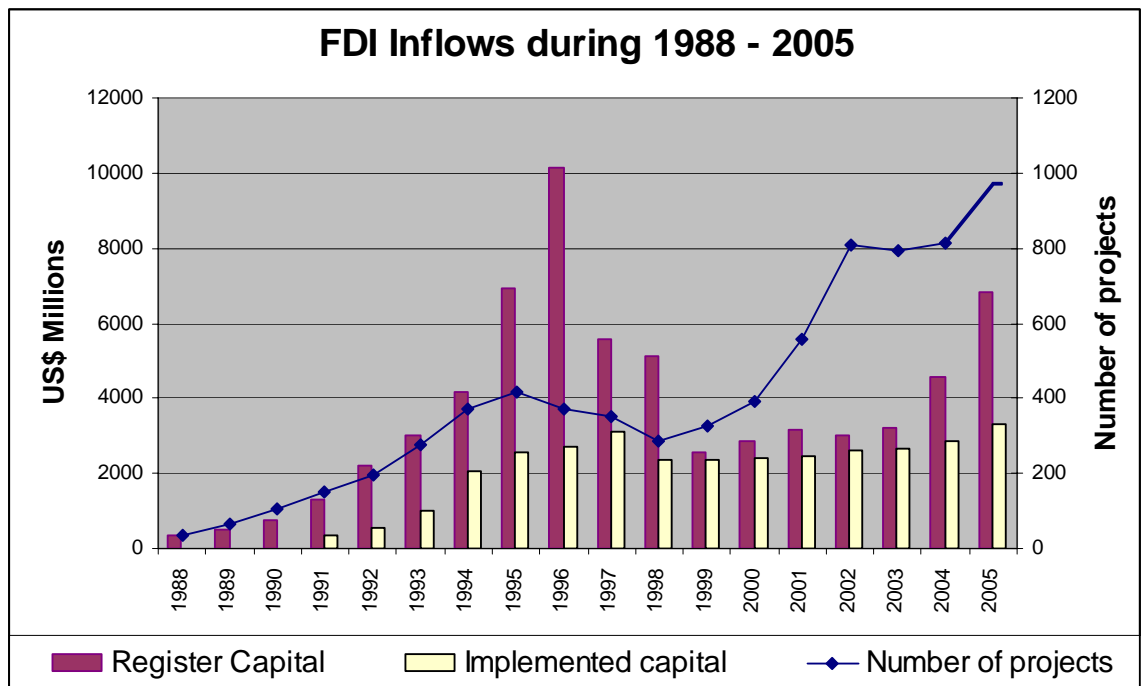


Figure 1: FDI Inflows into Vietnam during 1988-2005, source GSO.

Figure 1 shows the overall trend of FDI inflows in Vietnam for period 1988-2005. Together with the number of investment projects, the amount of registered capital for licensed projects increased rapidly in the first half of the 1990s, which is generally

referred to as the ‘investment boom’ period in Vietnam. Compared to the dramatic increase in registered capital, actual implementation remained far lower. The amount of registered capital peaked in the 1995 and 1996 and dropped sharply subsequently when the Asian economic crisis began to seriously impact on Vietnam.⁶ The FDI inflow started to pick up again as countries in the region recovered from the crisis and together with the signing of the US-Vietnam Bilateral Trade Agreement. Although not shown here in the above Figure, the trend of FDI inflow in Vietnam surges again with the accession of the country into the WTO. According to recently released statistics by the Government Statistical Office (GSO, 2006), 797 FDI projects with a total registered capital of US\$ 7.57 billion were licensed in 2006 across 43 provinces in the country. In the first three months in 2007, the result is even more spectacular with over 300 FDI projects and US\$ 2.5 billion registered capital.⁷

2.2 Sectoral distribution of FDI

Figure 2 shows the distribution of foreign direct investment in broadly defined economic sectors by the number of projects, the amount of registered capital and the amount of implemented capital for period 1988-2006. Table 1 gives further detailed breakdown by subsectors and by time period. As can be seen in the Figure 2 and Table 1, the majority of FDI inflows in Vietnam are into manufacturing in terms of the number of project, registered capital and implemented capital as well.

⁶ Although Vietnam remained a relatively closed economy during the financial crisis, a large portion of FDI came from the region resulting in a drop of FDI from this region.

⁷ Source: Vietnam Direct Investment Review <http://www.vir.com.vn/Client/Dautu/dautu.asp?CatID=9&DocID=12789> accessed on 3 May 2005.

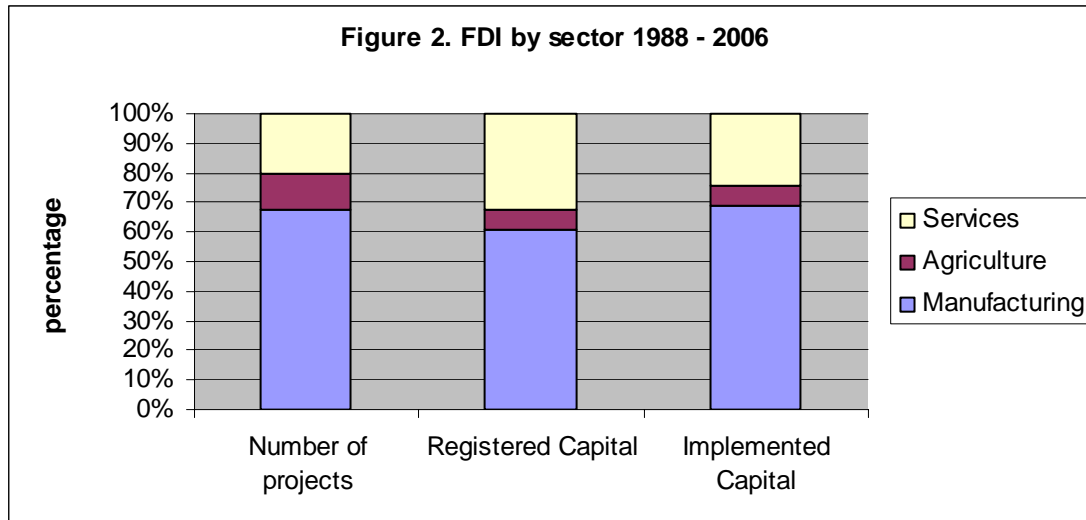


Table 1, with its detailed breakdown by smaller economic sectors and by time period provides a much richer picture of the trend of FDI into Vietnam. First, within the manufacturing, while during the early part of 1990s, the majority of FDI inflows were in oil and mining sector, by the end of the last century and early this century, light and heavy industry sectors dominate the field.⁸ Further, while FDI in agriculture were marginal in the 1990s, now this sector account for a significant share in the total FDI both in terms of the number of projects and registered/implemented capital (See Appendix 2). In the service sector, while getting smaller in relative terms, the hotel and tourism sector still remain significant. An important point is that is that in the early history of FDI, there was no FDI in many important service sectors such the construction of industrial zones, office, apartment, now these sectors start attracting significant portion of FDI inflows.

⁸ See also Nguyen Tue Anh et al (2006), Fujita (2000).

Table 1. Foreign Direct Investment by economic sectors 1988 – 2005

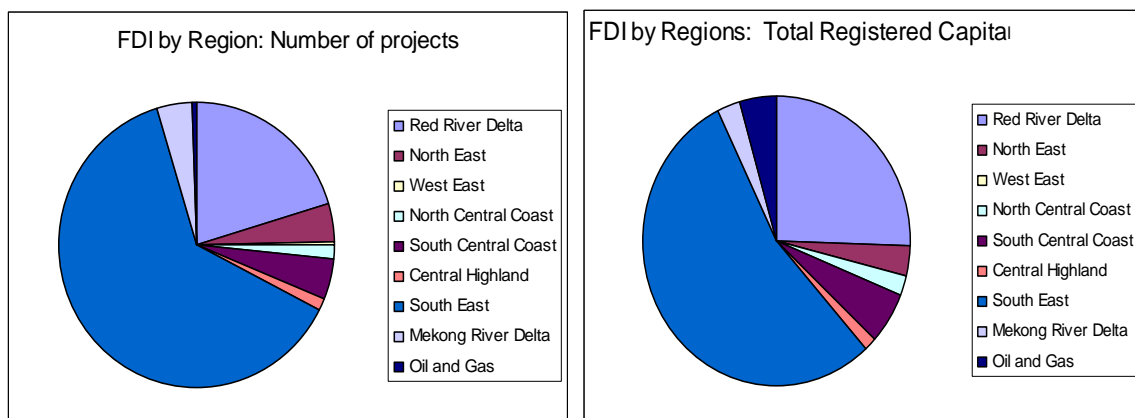
No	Sector	1988-1990		1991-1995		1996-2000		2001-2005	
		Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
I	Manufacturing – Construction	560764586	0.397	8153156337	0.479	10764148959	0.506	6620282420	0.648
1.1	Oil and Gas	384700000	0.686	994950000	0.122	2725049207	0.253	81200000	0.012
1.2	Heavy Industry	52960461	0.094	3085522359	0.378	3480013879	0.323	3632157252	0.549
1.3	Light Industry	62496973	0.111	1640483216	0.201	1563464286	0.145	2362300690	0.357
1.4	Food processing	50670000	0.090	1021552858	0.125	946286908	0.088	261724167	0.040
1.5	Construction	9937152	0.018	1410647904	0.173	2049334679	0.190	282900311	0.043
II	Agriculture – Forestry – Aquaculture	349500736	0.247	1408744798	0.083	993473472	0.047	896872319	0.088
2.1	Agriculture – Forestry	196004736	0.561	1273227376	0.904	915073541	0.921	790373826	0.881
2.2	Aquaculture	153496000	0.439	135517422	0.096	78399931	0.079	106498493	0.119
III	Services	502444001	0.356	7455919620	0.438	9505849433	0.447	2693762331	0.264
3.1	Post – Telecommunication	164585612	0.328	813135230	0.109	2291888721	0.241	979137464	0.363
3.2	Hotel – Tourism	302349000	0.602	2624060779	0.352	1148127552	0.121	575523004	0.214
3.3	Banking and Finance	10400000	0.021	357670000	0.048	205000000	0.022	119500000	0.044
3.4	Culture – Health - Education	1366667	0.003	184933989	0.025	375696337	0.040	214544964	0.080
3.5	Industrial Zones	0	0.000	447618793	0.060	454078144	0.048	74455788	0.028
3.6	Urban Development	0	0.000	0	0.000	3464236000	0.364	25500000	0.009
3.7	Office – Apartment	11940722	0.024	2862007024	0.384	1117018714	0.118	372245839	0.138
3.8	Other services	11802000	0.023	166493805	0.022	449803965	0.047	332855272	0.124
Total		1412709323	1.000	17017820755	1.000	21263471864	1.000	10210917070	1.000

Source: Foreign Administration, MPI

3.3. Regional distribution of FDI

According to official statistics by the Government Statistical Office (GSO) and the Ministry of Planning and Investment (MPI), all sixty four provinces in Vietnam have received FDI. However, the distribution of FDI across provinces are very much uneven. As shown in Figure 3, the South East region (covering Ho Chi Minh city and its surrounding provinces account for the largest share of FDI. In the North, Hanoi and neighbouring provinces account for the send largest share of FDI, leaving a very small proportion for other regions. This pattern is due to the fact that Hanoi and Ho Chi Minh city are the two main economic hubs of the country. The concentration of FDI in Hanoi and Ho Chi Minh has been attributed to the increased cost of living and doing business in the two cities. This has led to a tendency that foreign investors are looking elsewhere for the investment location. In addition, the local governments in these provinces have now realized the importance of FDI and are actively attracting inward FDI in their respective regions/provinces.

Figure 3: Regional FDI by number of projects and register capital



2.4 Country of origin

Table 2 documents the distribution of FDI by top investors in Vietnam. The top ten foreign investors account for around 80 percent of the total investment in terms of the number of projects, the total investment capital and the registered capital. As can be seen in the Table, the inward FDI in Vietnam was and still is dominated by regional investors. Investors from the Asian region account for 67 percent. Although, the US is a late comer to Vietnam, the inward investment inflow has increased significantly since 2001 after the conclusion of the Bilateral Trade Agreement (Parker et al 2005). For the European investors as a whole, the number of projects account for only about 10 percent, the total investment capital 15 percent and the register capital 20 percent.

Table 2. FDI by country of origin, 1988-2006

No.	Countries and Territories	Number of projects	%	Total capital	%	Registered capital	%
1	Taiwan	1550	0.23	8112.35	0.13	3576.90	0.13
2	Singapore	452	0.07	8076.01	0.13	2982.22	0.11
3	Korea	1263	0.19	7799.43	0.13	3228.95	0.12
4	Japan	735	0.11	7398.91	0.12	3277.00	0.12
5	Hong Kong	375	0.06	5279.52	0.09	1952.51	0.07
6	British Virgin Islands	275	0.04	3225.64	0.05	1133.75	0.04
7	Netherlands	74	0.01	2365.34	0.04	1373.47	0.05
8	France	178	0.03	2197.72	0.04	1339.94	0.05
9	US	306	0.04	2111.46	0.03	1151.24	0.04
10	Malaysia	200	0.03	1647.85	0.03	763.17	0.03
	Total	5408	0.79	48214.24	0.80	20779.13	0.78
	All countries	6813		60473.69		26505.82	

III. AN OVERVIEW OF POLICY AND BUSINESS ENVIRONMENT FOR FOREIGN INVESTORS IN VIETNAM

Since 1987, Vietnam has maintained a policy of encouraging foreign direct investment. As highlighted in its long term development strategy, one of the key elements for success is the continued ability to attract and utilize foreign inflow of capital including ODA and FDI. In many aspects such as protection of rights, preferential treatment and investment form, Vietnam's foreign direct investment policies, laws and regulations are quite liberal in comparison to other Asian countries (Schaumburg-Muller 2003). In addition, the FDI laws and regulations should be put in the context that Vietnam is a later comer on the FDI scene, a poor and transition country whose immediate challenges is to reduce poverty reduction and at the same time to meet the longer term of becoming an industrialized economy in twenty years.

The liberal FDI policy has been reflected in a number of regulatory changes and development. The first Law on Foreign Investment in Vietnam was passed by the National Assembly of Vietnam on 29 December 1987. This law was amended several times in 1992, 1996, 2000 and most recently replaced by a new law on investment integrating both domestic and foreign investment (Unified Investment Law 2006). These changes and amendments aim to remove obstacles against the operation of foreign investors and to improve the investment climate in Vietnam. Usually, these changes are to provide more tax incentives, to simplify investment licensing procedures, and to promote transfer of technology. It must be noted that although some of these changes are due to Vietnamese government's own initiatives to accommodate foreign investors, many

are due to external pressures from international economic integration (such as under the BTA or WTO accession).⁹

In 1992, a number of articles were added and amended¹⁰ to grant foreign investors with more rights and incentives, allowing FDI in the construction of infrastructure facilities, giving the same tax treatment between joint-ventures and wholly foreign-owned enterprises, and longer operation duration. In 1996, the Law was modified to allow for new forms investment including BOT (Build-Operate-Transfer), BTO (Build-Transfer-Operate), and Build-Transfer (BT) contracts. The modification also gave more rights and incentives to investors, such as the right to assign the contributed capital to other parties. However this law still retains a number of limitations such as the principle of unanimity in the board of management, preferences to purchasing local inputs in Vietnam. In 2000, the Law was amended and modified again to acknowledge the right of foreign investors to merger and acquire companies and branches, and the right to transfer the form of investment.

Most recently the Unified Law of Investment was passed on 29 December 2005 to replace all previous laws and regulation on domestic and foreign investment. The new Law which came into force on 1 July 2006 was prepared to meet requirements of the accession to the WTO. Under this new law, foreign and domestic enterprises are treated equally according to the rule of non-discrimination under WTO. Several other laws have

⁹ Partly this is caused by an increased competition among host countries for FDI.

¹⁰ The 1992 Law on Amendment of and Addition to a Number of Articles of the Law on Foreign Investment.

also been passed by the National Assembly including the Competition Law, the Law on Bankruptcy and the new Unified Enterprise Law.

In addition to developing its own FDI regulation framework, Vietnam has signed bilateral investment treaties with over sixty countries. Although Vietnam and the US do not have the BIT, the Bilateral Trade Agreement contains an important chapter on investment and several articles relating to TRIMS. These bilateral treaties have contributed to make the investment regime in Vietnam more in line with international standards and more favorable to foreign investors.

Despite its continued efforts, there are several problems that may cause harm to the business environment for attracting FDI. First, corruption is high on national agenda. According to the International Corruption Index, in 2005 Vietnam ranked 107 out of 158 countries with the average score of only 2.6 out of the 10 point scales. Fortunately, late 2005 the National Assembly passed the anti-corruption law to fight against corruption.¹¹

IV. A REVIEW OF FDI-RELATED LITERATURE IN VIETNAM

There are numerous reports on FDI in Vietnam. However, although growing in number the body of research literature on FDI in Vietnam is still very much limited. This is partly because of data availability. The unavailability of data has long been an obstacle for researcher doing empirical research on the determinants of FDI and its impacts on the economy. More recently, although the availability of data has allowed some research to be done, the data is not of good quality. At the local (provincial level), the data is not

¹¹ In a later section, we use the Provincial Competitive Index to model the decision of FDI location.

systematically available. There are some measurement problems with the data (Phan and Ramstetter 2006, Nguyen and Xing 2006). Still, the availability of data recently has allowed researcher to conduct numerous interesting and policy-relevant empirical research on FDI and its consequences. More recently the Government Statistical Office has made several enterprise-level dataset available for research. We believe this will lead to a surge of research work on the important topic of FDI for Vietnam.

In this section of our paper, we attempt to provide an updated literature review on FDI research in Vietnam.¹² Our purpose here is two-fold. We aim to provide an overview of the current status of FDI research in Vietnam and at the same time provide a comprehensive list of references for other researchers. In this section we first review studies that investigate the determinants of FDI inflows at both the national and sub-national levels in Vietnam (Mirza and Giroud 2004, Nguyen and Haughton 2002, Pham 2002, Nguyen Phuong Hoa 2002, Hsieh 2005, Meyer and Nguyen 2005, Parker et al 2005 and Nguyen Phi Lan 2006). This will serve as a basis for our analysis in the next section. We then review studies that examine the impacts of FDI on Vietnam economy, namely the impact of FDI on economic growth (Le Viet Anh 2002, Nguyen Phuong Hoa 2002, Phan and Ramstetter 2006, Vu et al 2006, Nguyen Phi Lan 2006), the spillover effects from FDI to local firms (Le 2005, Nguyen Tue Anh et al 2006) , the impacts of FDI on export (Nguyen and Xing 2006), job creation and poverty reduction (Nguyen Phuong Hoa 2002).

¹² As the literature is quite thin, we have encountered a lot of difficulty in our search for the literature to make our review as comprehensive as possible. We would appreciate if the interested reader could alert us on further references.

4.1 DETERMINANTS OF FDI IN VIETNAM

The impressive growth of FDI inflows into Vietnam has generated a number of empirical studies on the major determinants of FDI in Vietnam at both national level (why foreign investors choose Vietnam) and sub-national level (why a foreign firm chooses a specific region within Vietnam). Either explicitly or implicitly, most of these studies are based on the eclectic paradigm OLI framework proposed by John Dunning. In essence, Dunning (1993) argues that firms invest abroad because of O (ownership), L (locational) and I (internalisation) advantages. First, multinationals must have some firm-specific ownership advantage to compete with their rivals. Second, they are willing to invest in one host country to take advantage of location-specific characteristics of that host country rather than in others. Finally, multinationals must have the ability to internalise the O and L advantages.¹³

National Determinants

There are only a few studies that examined the determinants of FDI at the national level for Vietnam including Mirza and Giroud (2004), Nguyen and Haughton (2002), Parker et al (2005), and Hsieh(2005).

In a survey of subsidiaries of transnational corporations (TNC) in ASEAN, Mirza and Giroud (2004) have identified several country-specific characteristics that attract FDI into Vietnam.¹⁴ According to their survey results, Vietnam is chosen as a destination of investment because of its political stability, government policies, size of the local market and quality of the labour force. Their result is quite interesting because given Vietnam's

¹³ See appendix for a more detailed review of the OIL paradigm.

¹⁴ They asked about the motivations of companies investing in Vietnam.

small local market, 40 percent of the output for FDI firms are for local market. Further, Vietnam is highly appreciated for its relatively high level of education and quality of the labour force. However, it must be noted that their sample subsidiaries of TNCs is quite small, consisting of only 22 firms. The importance of low labour cost of Vietnam has also been highlighted elsewhere (ODI 1997).

Hsieh(2005) used a dynamic panel data model with fixed effect to analyze the locational determinants of FDI inflows in Southeast Asia transition economies including Cambodia, Laos, Myanmar and Vietnam, for the period of 1990 to 2003. Various variables are included in the model including lagged FDI, Asian financial crisis indicator, exchange rate, wage, GDP per capita, openness (trade volume divided by GDP), government budget, and human capital investment. The most important determinants are the one-period lagged FDI inflows, GDP per capita, and the degree of openness. The Asian financial crisis is found to have deterred FDI inflows in these countries.

Parker et al (2005) and Nguyen and Haughton (2002) examined the effect of the US-Vietnam Bilateral Trade Agreement (BTA) on the inflow of FDI into Vietnam. According to official statistics, Vietnam has concluded investment agreements with 46 countries. Most recently, the BTA contains a comprehensive chapter on investment. A question is whether such an agreement would lead to increased investment in Vietnam. The reason for special emphasis on the BTA is that the agreement is considered the most ever comprehensive agreement concluded by Vietnam with its far-reaching commitment

and the BTA is believed to serve as the platform for Vietnam's accession to the WTO.¹⁵ In their paper Nguyen and Haughton (2002) estimated a model of FDI determinants for sixteen Asian countries for the period 1991-1999. They find that openness (measured by export of GDP) of a country would attract FDI. Real exchange rate, government budget deficit, domestic savings are also important factors in attracting FDI. The important finding of their paper is that for poor countries which are not yet a member of WTO, the MFN status with the US would contribute significantly to the inflow of FDI. The authors then used their estimate to simulate the effect of the BTA on the inflow of FDI into Vietnam. Their simulation indicates that the BTA will initially increase FDI flow into Vietnam by 30 percent and in the longer term the FDI will double.

Parker et al (2005) reached the same conclusion that the BTA has increased the FDI inflow into Vietnam. Instead of using a formal model like Nguyen and Haughton (2002), Parker et al (2005) adjusted official data and use only descriptive statistical analysis. They examine FDI flows in clothing, furniture and fisheries, three sectors that have experienced strong export growth to the U.S. since the entry into force of the BTA, and found that the registered FDI in these three sectors clearly started to pick up in 2000, the year that the BTA was signed. The important contribution of FDI into these three sectors targeted toward export opportunities to the U.S. opened up by the BTA was substantial during this period.

¹⁵ Nguyen and Haughton (2002) also argue that the BTA will make FDI into Vietnam easier, opening up the US market for potential investors using Vietnam as an export platform, and remove the psychological barrier for US investors.

Regional Determinants

Once the multinationals have decided to locate their production facility in a particular country, the investing firm faces the question of where to locate its production plant. Here, the location-specific characteristics of particular regions and policy will play an important role.¹⁶ A number of studies have investigated the regional distribution of FDI in Vietnam including Pham (2002), Meyer and Nguyen (2005), Nguyen Phuong Hoa (2002) and Nguyen Phi Lan (2006). In general, the findings from studies on the distribution of FDI in Vietnam are quite consistent with studies for other countries. Common factors such as the market potential, labour factors, and infrastructure are found to be important determinants of FDI location.

Nguyen Phuong Hoa (2002) estimated a cross-sectional regression model for the locational determinants of accumulated FDI to the year 2000 across provinces in Vietnam. She found that market size represented by provincial GDP, human capital (measured by the percentage of worker having certificates in the total labour force) electricity, GDP per capita and the number of industrial zones are important determinants of FDI across provinces in Vietnam.¹⁷ Although her findings are quite consistent with the literature regarding market size, labor quality and infrastructure, by including both GDP and GDP per capita in the model may have caused the GDP per capita to have contradicting (opposite size) effect on the inflow of FDI.¹⁸

¹⁶ See also the Appendix for the theoretical review of location determination.

¹⁷ FDI is measured as cumulated FDI at the year 2000, other independent variables were measured at the year 1998.

¹⁸ GDP per capita is found to have negative impact on accumulated registered FDI but positive impact on accumulated implemented FDI. Thus, we suspect that some multicollinearity is at work here (See Table 4.1 in her paper).

Pham (2002) examined the distribution of FDI across provinces Vietnam during the period 1988-1998. He ran two regressions for committed and implemented FDI separately and found that local market, wage rate, labour force, infrastructure and government policies (tax incentives) are important factors determining the location of FDI in Vietnam.

Similar to Pham (2002), Meyer and Nguyen (2005)¹⁹ examined the distribution for both newly registered FDI in 2000 and cumulative FDI upto 2000. Although the focus of their paper is on the effect of institutions on FDI which is found to be a statistically significant determinant of FDI, they report several other factors such as population, transport, GDP growth, wage, education and the level of FDI in previous year (lag one period).²⁰ The main conclusion from their paper is that foreign investors choose to locate in provinces where there market transaction are supported.

In a system of equations estimated for provincial level data, Nguyen Phi Lan (2006) found that economic growth, market size, domestic investment, export, human capital, labour cost, infrastructure, labour growth and exchange rate are important determinants of FDI location across provinces.

¹⁹ Meyer and Nguyen (2005) also investigate the mode of entry for multinationals in Vietnam. They report that subnational institutions affect not only the the volume of investment but also the mode of entry.

²⁰ As they included the lag (one period) in their new FDI equation, most of the coefficients are not statistically significant except for the IP real estate variable.

4.2 THE ROLE OF FDI IN VIETNAM'S ECONOMIC DEVELOPMENT

The role of FDI in economic development of the host countries has been debated extensively in the literature. Traditionally inward FDI is believed to promote economic development by increasing capital stock and augmenting employment, whereas recent literature points to spillover effects (Görg and Greenaway 2004).

4.2.1 FDI AND ECONOMIC GROWTH

As already pointed out in the literature, when invested in country, multinational corporations bring along capital, technology, managerial and marketing skills and its global network. These are believed to contribute to the economic growth of the host countries. According to official statistics, the contribution of the FDI sector in Vietnam economy is significant and getting more and more important. In 2000, the contribution of the FDI sector to GDP was about 13.2 percent. This figure increased to 15.9 percent in 2005 (CIEM 2005). In terms of the growth rate, the FDI section has always had the highest growth rate, increasing from 11.4 percent in 2000 to 13.20 percent in 2005, significantly higher than the 7.7 percent and 5.0 percent in 2000 and 7.3 and 8.1 percent in 2005 for the State sector and non-state domestic sector respectively.. This has prompted a number of studies to examine the contribution of FDI to the economy of Vietnam empirically. There are a number of studies which examined the contribution of

FDI and economic growth. The consensus from these research points to the positive and significant contribution of FDI to economic growth of Vietnam.²¹

Despite the fact that the time series data is only available for period 1988-2002, resulting only 15 observations, Le Viet Anh (2002) attempted to explore whether FDI contribute to economic growth and whether FDI crowd out domestic investment using both growth accounting techniques and regression method. He reported that FDI contributes significantly to economic growth and stimulate domestic investment.

Nguyen Phuong Hoa (2002) investigated the impact of FDI on provincial economic growth during 1996-2000. She estimated a pooled regression on a panel data in which annual growth rate of GDP is regressed on FDI, public investment, human capital stock, labour growth rate and some other control covariates. She found that FDI exerts positive impacts on the economic growth rates across provinces during period 1996-2000. She interacted FDI with human capital stock and the estimated coefficient is positive and statistically significant in various specifications. She went further to argue that this is evidence that the human capital in Vietnam seems to exceed the threshold necessary to benefit from FDI. Supplemented econometric evidence with her own survey she reports that there is evidence of labour turnover leading to spillover of technology from FDI firms to domestic enterprises.²²

²¹ Kwang et al (1997) provided an early examination of FDI contribution to Vietnam's economy. But this analysis used only descriptive analysis and aggregate data only.

²² It would be more interesting if the author take advantage of the panel structure of her data to explore the dynamics of FDI on economic growth.

Phan and Ramstetter (2006) focus their study on the period 1995-2003. Similarly to Nguyen Phuong Hoa (2002) they adopt the endogenous growth model. However, instead of using the panel data, they regressed the average growth rate of GDP during 1995-2003 on the average of conventional covariates such as GDP growth rate, human capital, export, and domestic investment. To capture the effect of FDI on local economic growth they used the FDI share of provincial GDP. To deal with the potential simultaneity between growth and FDI, they have used the instrumental variables. However, they admitted that most of their instruments are weak.²³ Their results suggest that FDI is positively and significantly related to economic growth. Interestingly, when they include FDI in their growth regression, they found evidence of convergence of per capita growth among provinces in the country.

Nguyen Phi Lan (2006) used provincial level data to examine the impact of FDI on economic growth for the period 1996-2003. In order to deal with the problem of simultaneity, she modeled the relation between FDI and economic growth in a system of equations. She used 2LS, 3LS and GMM to estimate the system and the results are quite consistent across method used. FDI is found to be statistically significant, an important determinants of economic growth.

Vu et al (2006) examine the impact of FDI on economic growth for both China and Vietnam. Different from previous studies on Vietnam, Vu et al (2006) used sectoral- level

²³ See the previous section on the locational determinants of FDI in which GDP, economic growth are often included as an important determinants of FDI.

panel data instead of provincial level data.²⁴ They adopted the endogenous growth model and modeled the influence of FDI on GDP through labor productivity channel by allowing the coefficient of labour to vary over time. In their empirical specification, however, FDI enters the model to affect growth directly and through its interaction with labour. Their results indicate that FDI has a significant and positive effect on economic growth through labour productivity.²⁵ It is interesting to note that Nguyen Phuong Hoa (2002) using provincial level data and also interacted labour and FDI and found a positive and significant effect for the interaction term, suggesting that FDI may improve the productivity of labour in Vietnam.

4.2.2. Spillover Effects

FDI may raise productivity levels of domestic firms in the industries which they enter by improving the allocation of resources in those industries. The presence of multinationals together with their new products and advanced technologies may force domestic firms to imitate or innovate. The threat of competition may also encourage domestic firms which might otherwise have been laggards to look for new technology. Another route for the diffusion of technology is the movement of labour from foreign subsidiaries to locally owned firms. However, there is a lot of controversies in the literature (Görg and Greenaway 2004).

²⁴ It must be noted that the sectors as they defined in their paper are very much aggregated for Vietnam. The economy is consisted of 10 aggregate sectors and they use 7 sectors for their analysis. It is suspected that by using aggregate data, their analysis may miss out important dynamics at lower level of aggregation and may suffer from aggregation bias.

²⁵ Their results for China are quite similar to that of Vietnam.

The literature on the spillover effects in Vietnam is a bit mixed. Several authors (Tran 2004, Mirza and Giroud 2003, 2004, Schaumburg-Müller 2003) acknowledge the potential positive effects of FDI for productivity improvement but argue that the linkage effects are weak at best (Tran 2004, Schaumburg-Müller (2003) or smaller than what they found for other countries (Mirza and Giroud 2003, 2004). On the other hand, other authors using econometric techniques have found that there are evidence of spillover effects (Le 2005 and Nguyen Tue Anh et al 2006).

Using a recent survey of subsidiaries of TNS, Mirza and Giroud (2003, 2004) report some evidence of spillover effect for Vietnam. About 32 percent of inputs are sourced from locally-based companies (both domestic and foreign). However, the extent of such effect is smaller than that in Thailand and Malaysia. In particular, in Vietnam there is no supplier partnership scheme in place. These authors suggest that Vietnam needs to look for lessons from Malaysia and Thailand to engage TNCs.

Schaumburg-Müller (2003) examined the development of FDI in Vietnam during the 90s using only macro-level data. An important conclusion from this study is that FDI has not lived up to the expectation regarding linkages and technology spillover although in the longer term there is potential for these, particularly through skill-upgrading of the labour force.

Le (2005) investigated the technological spillover effects of FDI on labour productivity in 29 sectors for Vietnam using industry level data for two period 1995-1999 and 2000-2002. To measure the impact of FDI, she used foreign share in labour employment (percentage of foreign sector's employees of total industry's employees) in her

regression. She argued that this is a better proxy than share of foreign sector output. However, using this proxy did not allow her to distinguish backward and forward linkages. She found that there is evidence of spillovers from foreign direct investment on the productivity of domestic industries in Vietnam during 1995-1999 but this effect became weaker during 2000-2002 (possibly due to the market stealing effect). She also argues that the linkage is most notable for private sector and suggests policies to strengthen the private sector.

In contrast to Le (2005), Nguyen Tue Anh et al (2006) is the first to use firm-level data to investigate the FDI spillover effect. In particular, they use the Enterprise Census in 2001 ignoring the data available for 2002, 2003 and 2004 on the ground of data limitation. Similar to Le (2005), Nguyen Tue Anh et al (2006) investigate only the effects of FDI on labour productivity. The general conclusion from this study is that the presence of FDI improves the labour productivity of general enterprises and Vietnam's enterprises in particular.

4.2.3. FDI and export

FDI is believed to promote exports if there are substantial differences in factor endowments between the host and home countries. Multinationals from the capital-abundant home country tends to export capital-intensive products to their subsidiaries in the labour-abundant host country in exchange for finished goods. As part of the trade liberalization process, FDI enterprises in Vietnam have been granted the trading rights to engage in export and import activities. In many other developing countries, export-oriented FDI has proved to be a successful strategy rapid export and economic growth. In

Vietnam, the FDI sector has contributed significantly to export. The total share of export has increased to 24.2 percent in 1999 from a very low proportion of 2.5 percent in 1991 (Schaumburg-Müller 2003). Pham (2001) pointed out that about half of FDI into Vietnam has channeled into industries that Vietnam has comparative advantages. The exports by the FDI in these industries have increased significantly and are the main driving force behind the rapid export growth of Vietnam. Parker et al (2005) also point to the substantial increase in the export of FDI enterprises in Vietnam after the conclusion of the BTA between Vietnam and the US.

The contribution of FDI toward export has been calculated by Nguyen and Xing (2006) who estimate that every US\$2.5 of FDI will generate US\$ 1 of export. To explore the nexus between FDI and growth, they adopted the gravity model framework in which the bilateral trade between two countries is proportional to growth output and negatively related to the distance between them. Nguyen and Xing (2006) then augmented the gravity model with FDI to explore the relation between FDI and export. They constructed a dataset for Vietnam's trade with 23 main trading partners for the period 1990-2004. Their results indicate that FDI in Vietnam contributed significantly to the country's export. In particular, one percent increase in FDI will increase export by 0.25 percent.

4.2.4 FDI and Poverty Reduction

FDI can arguably have either direct or indirect impacts on poverty. The direct impact of FDI on poverty works through job creations and employment wage. The indirect of FDI

on poverty is through its impacts on economic growth. Although, as reviewed above, there are several studies on the impact of FDI on economic growth, the literature on linking FDI and poverty reduction is few and the potential impact of FDI on poverty reduction remains to be proved as remarked by Thoburn (2004). We are aware of only one study of the impact of FDI on poverty in Vietnam. Nguyen Phuong Hoa (2002) investigated the impact of FDI on poverty in 61 provinces in Vietnam for period 1996-2000. She basically regressed provincial Gini coefficient in 2000 on the GDP growth rate (between 1996 and 2000), the initial poverty level (in 1996), quality of labour, the initial Gini coefficient (in 1996), the Hunger Eradication and Poverty Reduction variable and the amount of FDI (between 1997 and 2000). She found that foreign direct investment does not have any impact on poverty. The estimated coefficient of FDI is not statistically significant across various specifications. However, pointing to the positive impact of FDI on economic growth she argued that FDI can contribute to poverty reduction indirectly.

4.2.5 FDI and Job creation

FDI can either have positive or negative impact on job creation in the country. With its establishment of production facility, FDI could create employment for the local country. But on the other hand, FDI firms could cause a reduction in the country's employment by pushing wholly domestic firms out of business. In Vietnam, it seems that the evidence from various studies point out that the impact of FDI on job creation is quite limited. According to a recent study by CIEM (2004), FDI firms account for a very small proportion of the labour force in Vietnam (around one percent). This conclusion is also supported by a recent survey conducted by Mirza and Giroud (2004). The average

number of employees in FDI firms in Vietnam is only 86 as compared with in 3,750 Thailand and 2,699 in Malaysia.²⁶

It must be noted that all these findings are based upon aggregate studies and qualitative survey. To our knowledge, we are not aware of any econometric model explaining the contribution of FDI to job creation in Vietnam. We believe this would be a potential and policy-relevant area of research that deserves further investigation.

²⁶ Schaumburg-Müller (2003) argues that although the number of job creation is small, the skill-upgrading of labour due to involvement with FDI may be of long-term importance.

V. AN ANALYSIS OF FDI SPATIAL DISTRIBUTION IN VIETNAM

In this section we attempt to analyze the factors that determine the spatial distribution of FDI in Vietnam. We contribute to the literature on FDI in Vietnam in at least two aspects. First, we used more up-to-date data than previous studies. Second, we are able to estimate separate equations for several key investors in Vietnam. This allows us to compare the locational determinants of FDI between key foreign investors.

Empirically there is a large volume of research on locational determinants of FDI. Most of the previous empirical studies on the locational determinants of FDI are built on the eclectic paradigm proposed by Dunning (1993).²⁷ The following group of factors can be identified to influence the decision to choose a particular location in a host country:

(i) market-related factors: Larger markets bring along potential high revenue generation, scale economy. Market is measured usually by population measures (size, density, and growth) and income/output measures such as GDP per capita and/or GDP growth rate in previous empirical studies.

(ii) labour-related factors such as availability, wage rate, and quality of the workforce: Labour variables are often included in empirical studies in many forms. Labour costs are of importance for location since they are part of total production costs. In addition, the

²⁷ See the Appendix for an overview of FDI theory and location theory.

unemployment rate and the total population are often used as indicators of labour availability.²⁸

(iii) infrastructure such as the transportation network, telephone and the availability of production facility are obviously important. Access to major good infrastructure is a primary consideration in the plant site selection of foreign investors. Previous studies have confirmed the importance in infrastructure in attracting FDI (e.g. Coughlin et al 1991, Taylor 1993);

(iv) government policy is often considered as a key variable that can be used to address the distribution of FDI across regions both at the national and sub-national levels. Government policy is believed to be of importance in the location decisions of foreign investors. At the sub-national level, several studies have reported the positive and significant effect of government policies on attracting FDI. Hill and Mundan (1992) report that financial incentives as important determinant of FDI in the UK. Taylor (1993) and Nguyen (1997) report a similar result for policy to attract FDI in assisted areas in the UK. However, other studies for the US (Coughlin et al 1991, Woodward 1992) report mixed results about the effects of policy measures such as taxes and promotional activities.

5.1 Model and data description

In our empirical analysis, we attempt to include all four groups of variables as the potential determinants of the FDI across provinces. In particular our model is specified as follow:

$$FDI = f(\text{Market factors}, \text{Labour factors}, \text{Infrastructure}, \text{Government polciy})$$

²⁸ Industrial relations are also an important consideration and some empirical studies take this into account by including the unionization.

where:

+ FDI is a measure of provincial allocation of FDI flows. There are various measures of FDI including the amount of FDI during 1988-2006; the amount of FDI in 2006; the number of FDI projects in each province during 1988-2006; the number of FDI projects in 2006. We are also able to obtain home-specific (country of origin) FDI data for a number of key investors. These data allow us to estimate separate equations for each country. The FDI by provinces are available for EU, US, Japan, China, ASEAN, Thailand, Taiwan, and Singapore during 1988-2005.²⁹

+ Market factors: We use provincial GDP per capita, and GDP provincial growth rate (2002-2003) to capture the effect of market factors. A market/location with higher purchasing power and growing is arguably more attractive to foreign investors, especially those are targeting the local economy. Other authors (Pham 2004) also include population as a measure of local market. In our regression analysis, we also include population, but we believe this variable is more likely to capture the availability of labour.

+ Labour factors: We have included several variables in our regression to capture the labour factors. We use the number of high school graduates (measured in 2004) as a proxy to capture the availability of labor in each province. This measure has been used by Pham (2002). We also include the wage rate (in 2002)

²⁹ Unfortunately, there are some key investors that data are not available such as Korea, Russia or Malaysia. We have data for Hongkong and Australia, but only for 1988-2003. We believe that it would be more interesting if we could obtain the data for these countries for further analysis and comparison.

to capture the labour cost. We also include the number of high school graduate (2004) as a measure of labour quality.

+ Infrastructure: We include the average number of telephone and the number of industrial zones in each province during 1988-2005 as measure of the level of infrastructure development in each province.

+ Policy: Although at the national level, the government of Vietnam is implementing a policy to attract foreign direct investment into the country, at the provincial level, the local authority may implement this policy differently or may have different attitude toward FDI. Some provinces are now having policy to compete with other provinces in attracting FDI. We use the Provincial Competitiveness Index in 2006 (PCI) to capture the local governance environment. The PCI is calculated by the VCCI and VNCI. This index has been advocated as a measure of local governance. Our hypothesis is that, better local governance would attract more FDI. Therefore, provinces with higher PCI will be more successful in attracting FDI.

A separate database has been constructed from various sources for this analysis, therefore it deserves some elaboration. The source of information on the dependent variable is taken from the GSO and MPI. The number of investment projects and the amount of FDI during 1988-2006 in each province are our dependent variables. Data on independent variables are obtained from various sources. As is well-known, conducting empirical research in Vietnam is seriously limited by the availability and consistency of data. The data on the number of industrial zone are from the Report on Vietnam's Accession to

WTO prepared by the WTO Working Group on Vietnam. The data on the provincial competitiveness index are obtained from VNCI. Data on various independent variables comes from the GSO. Ideally, we should have specified and estimated some kind of panel data model to take into account the dynamic effects of FDI and the development of the economy. However, data limitation does not allow us to do this. To further complicating the issue, Vietnam has undergone several changes of geographic administration. During the period from 1988 to 2006, the number of provinces has increased from 54 to 64. As a consequence, we limit ourselves at looking at the aggregate number for the whole period 1988-2006.

We have two measure of FDI, the amount of FDI and the number of projects. When our dependent variable is the amount of FDI, we believe the OLS would be appropriate. However, when the dependent variable is the number of projects, the OLS would no longer appropriate. Given the nature of count data, we believe the negative binomial model would be more appropriate.³⁰

5.2 Estimation results

The results for the determinants of FDI distribution across provinces in Vietnam are presented in Table 3. We estimated four models for (i) the cumulative FDI measured by investment capital during 1988-2006; (ii) the new FDI investment capital in 2006; (iii) the cumulative FDI projects during 1988-2006; and (iv) the new FDI projects in 2006. For the FDI measured by the investment capital, we estimated the models using the OLS methods. For the FDI measured by the number of projects, we estimated the negative binomial models using the maximum likelihood method.³¹ Except for the model for new

³⁰ The Poisson model may suffer from well-known the overdispersion problem.

³¹ Estimation is performed using the STATA 8SE.

FDI in 2006 measured by investment capital, the results are quite consistent with each other. Several factors are identified as important determinants of spatial distribution of FDI. In general, the results support the arguments on factors that influence the choice of location by foreign investors.

First, the GDP growth rate used as proxy for market potential is positive and significant at 1 percent level for both cumulative FDI investment capital and cumulative FDI number of projects, and 5 percent level for new FDI projects and not significant for the new FDI investment capital in 2006. The results imply that there is evidence of market-seeking FDI in Vietnam. This result is consistent with a survey finding by Mirza and Giroud (2004). However, the variable GDP per capital is not significant in all models, in contrasting with the finding reported by Pham (2002) for period 1988-1998. When removing the variable GDP growth rate from the model, the variable GDP per capital is still not significant statistically.

Two variables included in the models to capture labour market factors, the number of high school graduates (in 2004) and the wage cost (in 2002) are positive and strongly significant. The results indicate that the availability of labour (measured by the number of high school graduate). Although the effect of the wage variable is positive, and may seem counter intuitive at first glance, the higher wage level may indicate higher quality of labour.

The positive and statistically significant effect of the number of industrial zones lends support to the above argument for the importance of infrastructure. Better and more available infrastructure will attract FDI into a region both in terms of the investment capital and the number of project. However, the average number of telephone included to

capture the level of development of the infrastructure is not significant. This contradicts the result reported by Pham (2002).

In our model, as discussed above, we include a measure of local governance which is the high-profile Provincial Competitive Index (PCI) to capture the effects of variation in local government's attitudes, policies and implementation of policies toward FDI. Interestingly, this variable is not statistically significant in all equation. This implies that either FDI is not influenced by local government policy or PCI is not a good measure of local governance. Our analysis here highlights the importance of careful analysis and advocating PCI as measures of provincial attractiveness/competitiveness.

Tables 4-8 present the estimation results for the main investors (EU, US, Taiwan, Singapore and Japan) in Vietnam during period 1988-2005. Ideally, we would like to have the data for period 1988-2006 for each main investor. However, FDI data breakdown by main investors are only available for 1998-2005. Further, the data for the Provincial Competitiveness Index in 2005 are only available for 42 provinces and the methodology to calculate the index in 2005 is different from 2006, thus the estimation results may not be comparable with the results for period 1988-2006 in Table 3. We estimated two specifications for each measure of FDI, with and without the PCI in 2005.

In general, the estimation results for individual main investors are consistent with the results reported in Table 3. Evidence of the importance of market potential, the labour factors can be found in all equations. Similarly, the policy variable (PCI 2005) does not appear to be an important factor in attracting FDI in our home country specific regressions. However, there are several important differences between the main investors in Vietnam. **First**, for the European investors, market factors (GDP per capita and GDP

growth rate) do not seem to be important in their location decision. Most of the estimated coefficients are not statistically significant. On the other hand, the market factors are found to be important for all other main foreign investors in Vietnam. There is some evidence that European investors keep away from provinces with high PCI. The PCI 2005 is negative and significant at 10 percent level. **Secondly**, for the European, Japanese, and Taiwanese investors, the availability of (skilled) labour proxied by the number of high school graduates in 2004 is found to be an important factor in their locational decision. In contrast, we do not find the availability of labour is an important factor for US investors and only very weak evidence of the importance of labour for Singapore investors. Thirdly, the labour cost is found to be important for US, European and Taiwan investors only. For Japanese and Singaporean investors, the labour cost does not seem to be important factors in their location decision.

Our analysis of the determinants of spatial distribution for home country-specific investors points to important differences of factors in the location decision by foreign investors from different countries. The implication of this analysis is that local government should have different policies to target and attract different foreign investors differently. The estimation results for PCI 2005 in our home country – specific regressions are similar to our aggregate FDI analysis (presented in Table 3). This suggests that care should be taken when using the Provincial Competitiveness Index.

CONCLUSION

Since the economic reform in 1986, Vietnam has attracted a significant amount of FDI which in turn has contributed to the development of Vietnam's economy. In this paper we have provided an overview of FDI and the development of the legal framework. The

development of FDI and its contribution to economic growth has resulted in a growing literature. Although, the literature is still in its infancy, it has been able to identify important determinants of FDI at both the national and sub-national levels. Previous studies have also been able to link the contribution of FDI to economic growth, export and poverty reduction as well as point to the evidence of spillover effects to domestic firms. In our empirical analysis, we have been able to identify several factors that are important in the locational decision by foreign direct investors in Vietnam such as the market potential, the labour factors, and infrastructure. We are unable to find evidence of the impact of local government policy on FDI using the Provincial Competitiveness Index. We also investigate the determinants of FDI location by home country – specific investors. We have identified several important differences between foreign investors in Vietnam.

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Table 3

	Cumulative FDI (amount) 1988-2006 OLS		New FDI (amount) 2006 Negative Binomial		Cumulative FDI (number of projects) 1988-2006 OLS		New FDI (number of projects) in 2006 Negative Binomial	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
GDP per capita	-0.45	(0.83)	0.38	(1.42)	-0.29	(0.23)	-0.14	(0.37)
GDP Growth rate	13.34	(5.04)***	16.49	(12.01)	13.89	(2.77)***	13.57	(5.56)**
High school graduates	1.07	(0.21)***	0.83	(0.81)	0.57	(0.13)***	0.76	(0.31)**
Wage	1.24	(0.59)**	3.17	(1.79)*	0.97	(0.35)***	0.63	(0.70)
Industrial Zones	0.28	(0.08)***	0.20	(0.17)	0.22	(0.04)***	0.24	(0.07)***
Telephone per capita	0.00	(0.00)	0.00	(0.01)	0.00	(0.00)	0.00	(0.00)
PCI 2006	-0.03	(0.03)	0.01	(0.07)	0.00	(0.02)	-0.01	(0.03)
Constant	-12.11	(2.38)***	-25.38	(6.92)***	-8.65	(1.75)***	-10.99	(4.11)***
Alpha					0.42	(0.07)	1.08	(0.28)
R-squared	0.707		0.432					
F(7, 53)	29.93		12.5					
Prob > F	0.00		0.00					
Wald chi2(7)					372.32		119.06	
Prob > chi2					0.00		0.00	
Log likelihood					-257.65		-152.56	
Pseudo R2					0.20		0.16	
N (provinces)	61		61		61		61	

Note: Standard errors in parentheses; *=10%; **=5%; ***=1%;

Table 4 Determinants of inward European investment across Vietnam, 1988-2005								
	Cummulative EU FDI (amount) 1988-2005		Cumulative EU FDI (number of projects) 1988-2005		Cummulative EU FDI (amount) 1988-2005		Cumulative EU FDI (number of projects) 1988-2005	
	OLS		Negative Binomial		OLS		Negative Binomial	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
GDP per capita	-0.35	(1.57)	-0.48	(0.31)	0.11	(1.51)	-0.52	(0.28)*
GDP Growth rate	7.34	(13.65)	6.29	(3.95)	17.70	(18.91)	5.80	(7.01)
High school graduates	1.38	(0.48)***	0.89	(0.21)***	0.52	(0.49)	0.59	(0.22)***
Wage	2.00	(1.55)	1.89	(0.60)***	0.34	(1.60)	1.48	(0.52)***
Industrial Zones	0.38	(0.15)**	0.11	(0.05)**	0.42	(0.15)***	0.15	(0.05)***
Telephone per capita	0.00	(0.01)	0.00	(0.00)	0.01	(0.01)	0.00	(0.00)
PCI 2005					-0.10	(0.05)*	-0.03	(0.02)
Constant	-24.67	(5.70)***	-17.51	(2.65)***	-4.49	(9.14)	-10.67	(2.99)***
alpha			0.49	0.16			0.39	0.14
R-squared	0.4847				0.4653			
F(6, 54)	13.85							
F(7, 34)					8.57			
Prob > F	0.00				0.00			
Wald chi2(7)			187.15				176.66	
Prob > chi2			0.00				0.00	
Log likelihood			-114.74				-97.57	
Pseudo R2			0.27				0.25	
N	61		61		42		42	

Note: Standard errors in parentheses; *=10%; **=5%; ***=1%;

Table 5		Determinants of inward US investment across Vietnam, 1988-2005							
	Cummulative US FDI (amount) 1988-2005 OLS		Cumulative US FDI (number of projects) 1988-2005 Negative Binomial		Cummulative US FDI (amount) 1988-2005 OLS		Cumulative US FDI (number of projects) 1988-2005 Negative Binomial		
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	
GDP per capita	0.18	(1.04)	-0.40	(0.30)	-0.36	(1.32)	-0.38	(0.33)	
GDP Growth rate	32.35	(10.25)***	10.55	(3.83)***	46.24	(17.87)**	11.75	(6.45)*	
High school graduates	0.93	(0.58)	0.19	(0.14)	0.87	(0.86)	0.26	(0.21)	
Wage	2.00	(1.47)	1.67	(0.46)***	1.54	(1.69)	1.58	(0.41)***	
Industrial Zones	0.17	(0.12)	0.15	(0.03)***	0.16	(0.15)	0.14	(0.03)***	
Telephone per capita	0.01	(0.01)*	0.00	(0.00)	0.01	(0.01)	0.00	(0.00)	
PCI 2005					0.07	(0.08)	0.00	(0.02)	
Constant	-24.41	(5.86)***	-10.19	(1.47)***	-26.07	(11.60)**	-10.75	(3.35)***	
alpha			0.00	0.00			0.00	0.00	
R-squared	0.49				0.49				
F(6, 54)	24.95								
F(7, 34)					10.99				
Prob > F	0.00				0.00				
Wald chi2(7)			1109.77				907.79		
Prob > chi2			0.00				0.00		
Log likelihood			-88.14				-74.27		
Pseudo R2			0.30				0.29		
N (provinces)	61		61.00		42		42.00		

Note: Standard errors in parentheses; *=10%; **=5%; ***=1%;

Table 6 **Determinants of inward Taiwan investment across Vietnam, 1988-2005**

	Cumulative Taiwan FDI (amount) 1988-2005		Cumulative Taiwan FDI (number of projects) 1988-2005		Cumulative Taiwan FDI (amount) 1988-2005		Cumulative Taiwan FDI (number of projects) 1988-2005	
	OLS		Negative Binomial		OLS		Negative Binomial	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
GDP per capita	0.18	(1.11)	-0.34	(0.26)	0.81	(1.01)	-0.22	(0.23)
GDP Growth rate	34.26	(10.88)***	19.70	(4.22)***	40.32	(20.80)*	17.82	(6.32)***
High school graduates	1.45	(0.58)**	0.42	(0.24)*	1.26	(1.01)	0.13	(0.26)
Wage	1.49	(1.54)	1.43	(0.46)***	1.62	(1.76)	1.13	(0.49)**
Industrial Zones	0.32	(0.14)**	0.30	(0.05)***	0.24	(0.21)	0.32	(0.06)***
Telephone per capita	0.01	(0.01)	0.00	(0.00)	0.00	(0.01)	0.00	(0.00)
PCI 2005					0.06	(0.09)	0.00	(0.02)
Constant	-26.19	(6.19)***	-11.41	(3.36)***	-28.43	(16.16)*	-6.60	(4.57)
alpha			0.62	(0.21)			0.49	(0.22)
R-squared	0.4984				0.4952			
F(6, 54)	14.02							
F(7, 34)					7.70			
Prob > F	0.00				0.00			
Wald chi2(7)			163.33				193.13	
Prob > chi2			0.00				0.00	
Log likelihood			-151.18				-121.10	
Pseudo R2			0.23				0.22	
N (Provinces)	61		61		42		42	

Note: Standard errors in parentheses; *=10%; **=5%; ***=1%;

Table 7		Determinants of inward Singapore investment across Vietnam, 1988-2005							
	Cummulative Singapore FDI (amount) 1988-2005		Cumulative Singapore FDI (number of projects) 1988-2005		Cummulative Singapore FDI (amount) 1988-2005		Cumulative Singapore FDI (number of projects) 1988-2005		
	OLS		Negative Binomial		OLS		Negative Binomial		
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	
GDP per capita	0.98	(0.89)	0.57	(0.20)***	1.33	(0.99)	0.51	(0.21)**	
GDP Growth rate	29.08	(12.82)**	11.80	(3.14)***	44.51	(16.96)**	14.23	(4.45)***	
High school graduates	0.97	(0.74)	0.57	(0.30)*	1.17	(1.08)	0.42	(0.29)	
Wage	0.48	(1.55)	0.82	(0.55)	0.65	(1.99)	0.69	(0.54)	
Industrial Zones	0.49	(0.15)***	0.22	(0.04)***	0.43	(0.17)**	0.23	(0.05)***	
Telephone per capita	0.01	(0.01)**	0.00	(0.00)	0.01	(0.01)*	0.00	(0.00)	
PCI 2005					-0.06	(0.08)	-0.02	(0.02)	
Constant	-20.06	(6.09)***	-12.35	(3.90)***	-21.09	(12.52)	-9.20	(4.22)**	
alpha			0.20	0.13			0.18	0.14	
R-squared	0.59				0.61				
F(6, 54)	26.47								
F(7, 34)					15.99				
Prob > F	0.00				0.00				
Wald chi2(7)			230.03				200.63		
Prob > chi2			0.00				0.00		
Log likelihood			-80.55				-69.49		
Pseudo R2			0.34				0.33		
N (Provinces)	61		61		42		42		

Note: Standard errors in parentheses; *=10%; **=5%; ***=1%;

Table 8		Determinants of inward Japan investment across Vietnam, 1988-2005							
	Cummulative Japanese FDI (amount) 1988-2005		Cumulative Japanese FDI (number of projects) 1988-2005		Cummulative Japanese FDI (amount) 1988-2005		Cumulative Japanese FDI (number of projects) 1988-2005		
	OLS		Negative Binomial		OLS		Negative Binomial		
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	
GDP per capita	0.80	(1.10)	-0.27	(0.34)	0.95	(1.26)	-0.05	(0.37)	
GDP Growth rate	39.58	(10.76)***	12.97	(5.94)**	51.45	(19.23)**	23.07	(8.93)***	
High school graduates	2.60	(0.64)***	1.24	(0.34)***	3.63	(1.03)***	1.65	(0.51)***	
Wage	-0.90	(1.60)	1.01	(0.65)	-0.15	(2.00)	1.47	(0.83)*	
Industrial Zones	0.39	(0.14)***	0.14	(0.05)***	0.23	(0.18)	0.07	(0.07)	
Telephone per capita	0.02	(0.01)*	0.01	(0.00)	0.02	(0.01)	0.00	(0.00)	
PCI 2005					0.00	(0.07)	0.02	(0.03)	
Constant	-31.26	(7.58)***	-18.74	(5.56)***	-46.45	(15.89)***	-27.48	(8.67)***	
alpha			1.01	0.49			0.68	0.28	
R-squared	0.5237				0.5813				
F(6, 54)	16.03								
F(7, 34)					8.75				
Prob > F	0.00				0.00				
Wald chi2(7)			102.5				110.85		
Prob > chi2			0.00				0.00		
Log likelihood			-120.04				- 91.90		
Pseudo R2			0.2008				0.2278		
N (Provinces)	61		61		42		42		

Note: Standard errors in parentheses; *=10%; **=5%; ***=1%;

Table 9 Description of variable

	Variable name	Description	Data source
1	Cumulative FDI 1988-2006	Log of the amount of total cumulative foreign direct investment during 1988-2006	GSO, Statistical Year Book
2	New FDI 2006	Log of the amount of total foreign direct investment in 2006	GSO, Statistical Year Book
3	Cumulative FDI projects 1988-2006	The cumulative number of FDI projects during 1988-2006	GSO, Statistical Year Book
4	New FDI projects 2006	The total number of new FDI project in 2006	GSO, Statistical Year Book
5	Cumulative EU FDI 1988-2005	Log of the cumulative amount of FDI by EU investors during 1988-2005	MPI
6	Cumulative EU FDI projects 1988-2005	The cumulative FDI project by EU investors during 1988-2005	MPI
7	Cumulative US FDI 1988-2005	Log of the cumulative amount of FDI by US investors during 1988-2005	MPI
8	Cumulative US FDI projects 1988-2005	The cumulative FDI project by US investors during 1988-2005	MPI
9	Cumulative Japan FDI 1988-2005	Log of the cumulative amount of FDI by Japan investors during 1988-2005	MPI
10	Cumulative Japan FDI projects 1988-2005	The cumulative FDI project by Japan investors during 1988-2005	MPI
11	Cumulative Singapore FDI 1988-2005	Log of the cumulative amount of FDI by Singapore investors during 1988-2005	MPI
12	Cumulative Singapore FDI projects 1988-2005	The cumulative FDI project by Singapore investors during 1988-2005	MPI
13	Cumulative Taiwan FDI 1988-2005	Log of the cumulative amount of FDI by Taiwan investors during 1988-2005	MPI
14	Cumulative Taiwan FDI projects 1988-2005	The cumulative FDI project by Taiwan investors during 1988-2005	MPI
15	GDP per capita	Log of GDP per capita in 2003	GSO/Statistical year book
16	GDP Growth rate	GDP growth rate between 2002-2003	GSO/Statistical year book
17	High school graduates	Log of the number of high school graduates in 2004	GSO/Statistical year book
18	Wage	Log of monthly wage in 2002	GSO/Statistical year book
19	Industrial Zones	The number of industrial zones 1988-2005	The Report of the WTO working Party on Vietnam's Accession
20	Telephone per capita	The average number of telephone per capita	GSO/Statistical year book
21	PCI 2005	Weighted PCI index calculated by VNCI in 2005	VNCI and VCCI
22	PCI 2006	Weighted PCI index calculated by VNCI in 2006	VNCI and VCCI

Appendix 1: Theoretical review of theories of foreign direct investment

The traditional explanation of foreign direct investment (FDI) is based upon the concept of capital arbitrage in international capital theory. Differing rates of return to capital induce movements of capital flows corresponding to differences in the marginal productivity of capital. This theory explains why investment is expected to flow from capital-abundant countries to capital-scarce countries. However this theory fails to explain why capital flows take the form of foreign direct investment. According to Dunning (1988), this theory can be criticised on at least two points. First, in addition to capital flows, FDI involves the transfer of other resources than merely capital, namely technology, management, organisational and marketing skills, and it is the expected returns on all these resources rather than on the capital alone that induce firms to invest abroad. Second, FDI is different from portfolio investment since in the FDI case, resources are transferred within the parent firms rather than between two parties as in the case of portfolio investment, which means that control over resources is maintained by the parent company. It is this control that helps investing companies to fully exploit the rents from their own resources (Hymer 1976).

It has been argued that when a firm invests abroad, it has to face additional costs in comparison with local competitors due to various kinds of barriers, such as cultural, legal, institutional and language differences. To operate successfully in foreign markets, the investing firm must have some advantage over indigenous firms (the owner-specific advantage). These advantages are specific to the firm and readily transferable within the firm. However, the presence of such advantages means that the necessary but not the sufficient conditions for firms to operate in foreign countries are satisfied. This is because these advantages alone cannot explain why production needs to be located abroad, and the investing firm can exploit the advantages through other alternative options such as exports or licensing. Therefore to account for the FDI option it is necessary to take into consideration such location-specific factors as relative production costs, trade barriers, and market characteristics (Hood et al 1984). The combination of these two advantages is of decisive importance. It will determine whether a firm has advantages over other firms and whether to exploit these advantages abroad or at home.

1.1 Theoretical explanation based on market imperfections

One of the earliest attempts to introduce market imperfections in the theory of FDI was made by Hymer (1976). He argued that the investing firm must have some advantages specific to its ownership which are sufficient to outweigh the disadvantages they faced in competing with indigenous firms in the host country. These exclusive advantages imply the existence of some kind of market failure. This is because in a perfectly competitive world, all firms are competing equally and have no advantage over others. As pointed out above, FDI cannot take place in such a world. As Kindleberger (1969: 13) has stated, for FDI to take place 'there must be some market imperfections in markets for goods or factors including among the latter technology, or some interference in competition by government or by firms, which separates markets'. These market imperfections take the form of unique and often intangible assets to firms, including product differentiation, brand name, marketing in the product market or special managerial skills, patented technologies, special access to capital markets, or economies of scale either internal to firms or external to firms as a result of government intervention.

However, as other writers have pointed out (Hood et al 1984, Dunning 1988, 1993) the existence of ownership advantages does not necessitate production abroad, for the foreign firm can exploit its advantage through licensing or through producing at home and exporting. To explain the choice of FDI over producing at home and exporting it is necessary to take into account local-specific factors such as trade barriers and market characteristics. This will make FDI preferable to exporting because it allows foreign firms to exploit differences in factor price, overcoming trade barriers and the like. A clear model dealing with the choice between exporting and FDI has been developed and can be found in Cave 1982. This model was originally developed by Horst (1971, cited in Caves 1982). It assumes two countries, a downward-sloping demand curve for the firm concerned and profit maximization. Horst derived the so-called marginal cost of exporting curve showing the quantity that would be exported at differing price levels. Horst also explores various situations in which a tariff is imposed, and the firm enjoys economies of scales. In essence, this model has shown how the firm interacts with different locational-specific factors. As far as the licensing option is concerned, Caves (1982) has argued that the primary advantage of foreign investment is the existence of rent-yielding assets, most of which are intangible. Some of those assets namely technology and know-how are in some way special in so far as they prevent foreign firms from capturing the full rents embodied in them by selling or by leasing. Several reasons have been advanced. Firstly, those assets are public goods in nature, in the sense that the marginal cost of replicating them is trivial compared with the initial cost of

developing them. As a result, the firm will opt for FDI rather than licensing or selling them. Secondly, in addition to their public goods characteristics, there is informational asymmetry and uncertainty which prevents the advantage-possessing firms from providing all information to the potential buyer. This arises from the nature of the assets mentioned above. On his part, the potential buyer will not be willing to pay the full price for the assets once full information about the assets is available. Thirdly, many of the assets are inseparable from the firm. In summary, the explanation of FDI based upon market imperfections is essentially that firms undertaking FDI operate in an imperfectly competitive market environment, where it is necessary to acquire and sustain some net advantages over local firms in the host country (Dunning 1979).

1.2 Internalization theory of foreign direct investment

Internalization is another explanation of FDI, which also focuses on market imperfections. But these imperfections are in the markets for intermediate inputs/products and technology. It should be noted that intermediate inputs in this context are not just semi-processed materials but more often are types of knowledge incorporated in patents, human capital and so on (Hood 1984). Imperfections in markets for intermediate inputs will create difficulties and uncertainty for the firm to fully exploit its advantages. A profit-maximizing firm faced with such imperfections will try to overcome these in the external market by internalizing them in their operation, either through backward or forward integration.

There are a number of such imperfections which are considered important in stimulating internalization. An example is government intervention in the form of tariff, taxation, and exchange rate policies that create difficulties in the firm's sourcing activities and in exploiting location-specific advantages. All these factors stimulate firms to internalize. Again the informational asymmetry with respect to the nature and value of the product between knowledge-possessing firms and the potential buyer is another imperfection in the intermediate product market. When the internalization is undertaken in the international market, FDI is the result. Buckley and Casson (1976, cited in Graham et al 1995) have observed that 'for multinational enterprises to serve non-home-nation markets via FDI' rather than either exporting or licensing 'there must exist some internalization advantage for the firm to do so'. The internalization advantage will be some kind of economy for the firm to exploit market opportunities through 'internal operations rather than through arm's-length transactions' (Graham et al 1995). These economies are often

associated with costs of contract enforcement or maintenance of quality or other standards. For example, when a firm selling intermediate inputs is unsure about the quality or standard of the final product that carries its name, then the firm may internalize by forward integration.

Although the internalization approach is also based on market imperfections, it differs from that presented in the previous section. The difference is that it is not only the possession of unique intangible assets that give the firm its advantages but the internalization process that does. As Dunning (1993: 75) has pointed out, the 'internalization theory is primarily concerned with identifying the situation in which the markets for intermediate products are likely to be internalized, and hence those in which firms own and control value-adding activities outside their natural boundaries'.

1.3 Product cycle hypothesis

The above explanations of FDI have been based upon static advantages, either specific to firms or specific to a location. However, the relative importance of these advantages will change over time as the product develops through its life cycle. As a consequence the firm's choice between export, FDI and licensing might also change. Vernon (1966) developed the product cycle model to deal with such dynamic aspects of FDI activities. Originally Vernon attempted to explain US investment in Europe during the post-war period by answering two questions. The first concerns why innovations occur in developed countries and the second concerns why they are transferred abroad. Vernon tried to answer these two questions by relating the product life cycle, which is divided into three stages progressing from the 'new' to the 'mature' and ultimately the 'standardized' product, to the location decisions made by firms and the choice between exports and overseas production.

In the first stage, market conditions in developed countries, particularly in the US, facilitate the innovation of new products. Because of a combination of higher income levels and higher unit labour costs, a strong incentive exists for producers in developed countries to develop new products which are either labour-saving or are designed to satisfy high-income needs. In addition to this, on the supply side developed countries are endowed with a comparative advantage to produce such goods due to their stronger propensity to investment in research and development. Even so, this does not necessarily mean production will be located in developed countries. However, in this stage because

of the fact that the product itself is unstandardised, production costs are not a serious consideration. Moreover, the price elasticity of demand for the new product might be low due to product differentiation or monopoly advantages acquired by the innovating firm, and there is likely to be a need for 'effective communication between the potential market and the potential supplier', so that firms often choose to locate their production at home, in developed countries (Vernon 1966).

The second stage is when the product is maturing, and potential competitors appear. Some degree of standardization has been introduced in the design and production process. Faced with the resultant competition, producers are more concerned with the cost of production. Furthermore, demand for the product might appear abroad creating new market opportunities for the firm. Originally, firms serve foreign markets by exporting from home-based production. But later on, firms also consider two other options, licensing and FDI. However, in international markets, licensing is an inferior option to FDI due to inefficiencies. All these factors affect the production location decision. In general, if the marginal production cost plus the transport cost of the goods exported from the home country is lower than the cost of potential production in the importing country, the firm will export rather than invest (Vernon 1979).

In the final stage of this model, namely the standardized product, less developed countries are at a comparative advantage as a production location. At this stage, market knowledge and information are less important, therefore the priority is for the least cost location; competition is primarily based on price and demand is more price elastic. The net result is that the production facility or assembly is moved to developing countries to take advantage of low labour costs (Vernon 1966).

Although the product cycle hypothesis has several weaknesses and might be an oversimplification of reality, it has provided an explanation of why innovations occur mostly in developed countries, while at the same time it explains both trade and investment flows.

1.4 Eclectic paradigm

Dunning (1979) expresses his dissatisfaction with these theories, arguing that they are only partial explanations of FDI. This has induced him to develop an eclectic approach to the problem. This approach relies on and pulls together different strands of economic

theory to explain the ability and willingness of firms to engage in FDI rather than domestic production, exports, licensing or portfolio investment. He states that the capability and willingness of firms to make FDI depends on the possession of assets that are not available to other firms in foreign countries.

Dunning (1993) has identified and distinguished three different kinds of assets. The first group is owner-specific assets which are assumed unique to firms. Such assets include not only tangible assets like capital, manpower and natural resources but also intangibles such as technology, know-how, information and marketing. They are of the sorts specified in the first section. The second consists of assets which might be specific to a certain location. These include not only natural endowment but also cultural and political factors and government policies such as tariffs. Another dimension of location-specific assets, found in Vernon's product cycle hypothesis, is that it is profitable for the firm to combine its ownership of assets specific to firms with location-specific assets in the host country. The third is the internalization of assets which arise in the presence of market failure. It is the internalization of assets that allows firms to fully exploit owner-specific and location-specific assets.

The principal hypothesis of this eclectic theory is that a firm will engage in FDI if the following three conditions are met:

1. It possesses ownership advantages over firms of other nationalities in serving particular markets. These advantages are specific to the firm.
2. Given (1) is satisfied, it must be more beneficial to the firm to exploit the advantages themselves rather than to sell or lease or license them to foreign firms, that is to internalize its advantages through an extension of its activities rather than externalizing them.
3. Given (1) and (2) are satisfied, it must be profitable for the firm to combine these advantages with some factors in the foreign countries.

(Dunning 1979)

The key point of the eclectic theory is that any one of these advantages may be necessary but not sufficient to give rise to FDI. It is necessary to consider all three conditions together. Dunning (1993) concludes that all forms of FDI can be explained by the above three conditions.

2 Theories of production location

Section 1 offers answer to questions of why firms engage in FDI, which countries they invest in, and when to invest. But once a particular host country is identified, the investing firm faces the question of where to locate its production plant. The answer to this question can be found in the economic geography literature, which offers various explanations of the location decision. The purpose of this section is to examine different approaches to the question of optimal location. This will serve as a useful basis for understanding the location decision made by foreign investors. This will help to provide an understanding of why certain areas in the same country attract so much investment while others do not.

This section begins with neoclassical theories, which are based on the assumption of profit maximization of economic agents. Neoclassical location theory has its origin in the work of Weber, whose work has been developed and expanded. The theory is neoclassical in the sense that it was developed on the basis of Weber's classical theory directed toward the determination of the least-cost location, but it has been extended well beyond the classical approach to incorporate demand considerations. This is followed by the behavioural approach to the question of location. This approach is regarded as a response to the shortcomings of neoclassical theories. Thirdly, the structural approach is presented, which puts the location decision in the macro-context of the whole economic system.

2.1 Neoclassical location theory

Neoclassical location theory is based upon the assumption that entrepreneurs are rational economic agents who seek a profit maximizing location. As mentioned above, the theory is based upon the neoclassical theory developed by Weber, therefore, first of all the least-cost location developed by Weber will be presented. Secondly, the generalization of the variable-cost model will be examined. Thirdly, revenue is introduced to take into account demand factors.

2.1a. Weber's least-cost location theory

Weber (1929) was concerned with finding an optimal plant location. In his work, optimality means least-cost location, which was initially considered purely in terms of

transportation cost, and later expanded to account for labour and agglomeration economies. Weber developed his theory on three basic assumptions. Firstly, the locations of raw materials are given. Secondly, market places and sizes are given. Perfect competition is implied, each producer having an unlimited market with no possibility of monopolistic advantages from choice of location. Thirdly, an unlimited supply of labour is available at certain locations but is immobile.

Weber used the locational triangle to derive the least-cost location. The triangle was constructed from two points of material sources and one market point, or two market points and a single material point. The optimal location for the plant is the single point within this triangle such that the costs of shipping materials from the two sources to the plant location and the final product from the plant to market are minimized. The identification of the optimal point is a function of the volumes of the material transported and unit transport cost. Within this triangle, each corner of the triangle will exert a pull on plant location, proportional to the volume to be transported and inversely proportional to the distance to be covered. At this stage, the primary determinant of location is the transportation cost. However, Weber recognized the importance of labour cost, which can divert the plant from the least transportation cost location to the least labour cost location. Weber pointed out that this would take place if the labour cost saved exceeds the additional transportation cost incurred when locating away from the least transport cost location. He analysed this by using 'critical isodapanes'. Isodapanes are lines joining points of equal transportation cost around the least-transportation cost location. The farther the 'isodapanes' are from the least cost location, the more additional transportation cost the firms has to incur. The 'critical isodapane' is the one that has the same value of the saving in labour cost. Beyond the 'critical isodapane' the additional transportation cost incurred will be higher than the saving in labour cost. If the cheap labour location lies within the 'critical isodapane', it is a more profitable location than the least transportation cost one. As a result, the optimal location will be diverted to the least labour cost location. Weber also dealt with agglomeration economies which are treated in the same way as labour costs. The critical isodapanes in this case will be the isodapanes that have the same value of the benefit brought about by agglomeration economies. The places of agglomeration that firms will locate in are the intersection of their 'critical isodapanes'. Within this intersection, the benefits resulting from agglomeration will outweigh the additional transportation cost.

2.1.b The generalized variable cost model

Smith (1981) argues that the neoclassical framework developed by Weber suffers from an undue preoccupation with transportation and with the determination of the least cost location. He developed a model which deals with total costs rather than just the cost of transportation, with 'the cost of all inputs treated as continuous spatial variables' (Smith 1981:149). He shows that the Weberian triangle can be extended to an n-corner figure to incorporate more material resources, more markets and more realistic situations. This can be done by treating, for example, the cheap labour source as a corner of the figure. Capital, land, other inputs can be treated similarly. In this case, each corner will exert its pull on plant location proportional to the quantity of input needed and the transport cost. The relative strength of all these forces will determine the position of the optimal location. However, he points out that while generalizing the neoclassical model in this way is simple, the problem of solving the least cost location is difficult. This is because it is unsatisfactory to treat the spatial variations in other costs in the same way as transportation. Transportation costs may be considered as a simple or even linear function of distance, but other input costs are not. To overcome this he has suggested that 'each input can be regarded as having a spatial cost surface, which at any point represents the cost of acquiring the quantity necessary for a particular volume of output' and that the total cost surface can be obtained by summing over all individual input cost surfaces (Smith 1991: 25). At any location (*i*) the total cost (TC) will be

$$TC_i = \sum_{j=1}^n Q_j U_{ij}$$

where TC_i is the total cost at *i*

Q_j is required quantity of input *j*

U_{ij} is unit cost of *j* at *i*

and the summation is for *n* inputs. The optimal location is where the total cost is minimized due to the assumption of constant total revenue over space. This results in the maximum profit location where the total cost is least. He also assumed that the production function is the same everywhere. In addition, he assumed away demand conditions, substitution of inputs, government subsidies, economies of scale, and agglomeration economies.

2.1.c Locational interdependence

The framework employed in the neoclassical theory and its later extension, the generalized variable cost model is purely competitive. In this model, buyers are concentrated at certain points and each seller has an unlimited market. It has been argued that this is the major shortcoming of the both neoclassical and generalised variable cost model presented above. In these models, demand is assumed away, and revenue is assumed constant over space. Smith (1981) acknowledges that once demand is allowed to vary in space, the least cost location does not mean the point of maximum profit, which is what the producer aims to achieve. This is because a low cost location might mean a low volume of output and hence revenue due to a poor location. This has led to the interdependence theory of location, which is predicated on the theory of oligopoly. This is because every business has to face competition and the behaviour of competitors may be an important characteristic of the economic environment in which firms operate and this affects the location choice of firms (Chapman et al 1987). The interdependence theory of location abstracts from cost and explains the location of firm as trying to control the largest market area possible. It focuses on demand and spatial competition and on the division of a market area by rival firms, which ultimately affects revenue earned by firms. By assuming that resources and population are evenly distributed and that production costs are constant over space, this theory analyses only the number of firms involved in a market and their transportation cost. As a result the spatial pattern of firms and market areas is a function of spatial variations in demand and the interdependence of firms (Smith 1981, Greenhut 1957).

The locational interdependence approach can be illustrated in two steps as follows. The first step is to derive the boundary of each firm's market area and the second step is to introduce competition from rival firms. The boundary of a firm's market area is derived as follows. At any location i the total revenue earned by a firm is:

$$TR_i = \sum_{j=1}^n Q_j P_j$$

where TR_i is revenue at location i

Q_j is quantity sold at market j

P_j is price at j

the summation is over n market.

Demand is assumed to depend on price such that any price increase will lead to a reduction in demand. This is the point that transportation cost comes in. As other production costs are assumed constant in space, increases in price are proportional to the distance to be covered from the plant to market areas. The price prevailing at market will be the delivered price which reflects the addition of transportation and other distribution costs to the cost of production at the plant. The boundary of the market area of a firm will be determined by the highest delivered price acceptable by consumers. Figure 1 shows that firm A has the production cost C , and the market is willing to pay a maximum of P . The market area of firm A is determined by the intersection of the delivered price line, t_a , which covers production cost, transportation and other distribution costs, with the maximum price line, P , at which consumers are prepared to pay to generate the market area marked by point $MA - MA'$. In the absence of firm B, firm A can serve the whole market area $MA-MA'$.

Secondly, competition is introduced by allowing the presence of a second firm. The production cost and delivered price of the second firm is assumed to be equal to that of the first one. The intersection of the delivered price lines of the two firms will determine the market share of each firm. Part of the market area of firm A is transferred to firm B. In figure 1, the fraction $X-MA'$ is transferred to firm B in this linear market model. From this rather simple illustration, it is clear that the demand and revenue facing firms are significantly influenced not only by the number of firms but also by the locations of other firms. Later entrants are clearly influenced by the location of earlier firms. Greenhut (1964) concludes that the elasticity of the demand function, the history of competition, the degree of competition and many other demand factors determined by location have influenced the selection of plant sites.

2.1.d The spatial interaction of cost and revenue

The neoclassical theory of location has developed from the early work of Weber, through the generalized variable cost model and the locational interdependence model. It is clear from the assumptions of these two models that they both suffer from restrictive assumptions. The least cost approach ignores demand conditions. On the contrary, the demand or locational interdependence approaches ignore the variations of cost in space. As a result, on the one hand we can identify the least cost location for a certain level of demand for our output. On the other hand, we can identify the revenue maximizing

location with some assumptions on production costs. It is recognized that in reality neither demand nor costs are spatial constants, and that the assumption of rationality on the part of entrepreneurs means they will look for the maximum profit location rather than least cost location or revenue maximizing location. However, several theorists (Smith 1981; Chapman et al 1987) have pointed out that simultaneously relaxing both of these assumptions, it is impossible to construct a model to define the optimum location at which profit is greatest. Nonetheless, Greenhut (1955) attempted this to incorporate factors influencing both cost and revenue (demand) in his theory. Although Greenhut stressed both factors, his theory and empirical enquiry have remained preoccupied with the cost side. However, the two models are very useful in understanding the fundamental factors that are likely to influence the location decisions of firms.

All of this has led to the adoption of the 'spatial margin to profitability' concept to account for the economic fact of life of sub-optimal location decisions. The spatial margin defines an area within which firms can operate profitably, with total revenue exceeding total cost. Operating outside the spatial margin firms would incur losses. The spatial margin is determined by the intersection of the space cost curve and space revenue curve. And different margins can be associated with different volumes of output and in a sense points on the spatial margin are similar to the break-even points (Smith 1981, 1991).

2.2 Behavioural location theory

The fundamental assumption underpinning the neoclassical location theory presented above is that firms seek to maximise profits. This is done by achieving an optimum location, among other things. It is argued that while neoclassical location theory provides a benchmark for conditions required to find an optimum location, its capacity to explain the actual location decisions of firms is very limited due to abstraction from reality. The conventional profit-maximizing assumption requires the decision maker to be an economic man who follows the single-minded pursuit of profit maximization and possesses complete knowledge of all relevant economic information including the ability to predict the action of competitors. In reality no one can match this requirement (Chapman et al 1987; Smith 1981). In order to accommodate the sub-optimal location in reality with the neoclassical theory, Smith (1981) introduces the concept of spatial margin to profitability, which defines the boundary of an area around the optimal location within which a profitable operation can be obtained. At the margin, the total cost is equal to total revenue. However, the concept of a spatial margin to profitability suggests sub-

optimal behaviour. This has led to the behavioural approach to the study of industrial location, which recognizes that in the real world decision makers do not have the complete knowledge ascribed to economic man and they often 'adopt courses of action which are perceived to be satisfactory' (Chapman et al 1987: 19).

The behavioural theory of location goes further than neoclassical theory by dealing with two specific aspects left open by the neoclassical approach. Firstly, decision makers have neither perfect and complete knowledge and information on which to make the optimal location choice, nor perfect ability to use this information. This aspect was dealt with in the so-called behavioural matrix, in which individual firms are placed according to their information and ability to use it. This matrix was originally developed by Pred (cited in Smith 1981: 117). In essence, the matrix shows that the better informed and the more capable a firm is to use its information, the more likely the firm will choose a location at or close to the optimal point. Conversely, with less information and less ability, the likelihood that a firm will locate at an optimal point is small. The main weakness of the behavioural model is that it allows for the possibility that an enterprise, however ill-informed and incapable, may make an optimal location decision (Smith 1981; Lever 1987).

Secondly, it has been argued in the behavioural theory that the choice of location can be considered as a utility maximizing choice, in which profit is only one among several other elements. Thus, the entrepreneur might choose a location far away from the optimal one in profit terms, but may yield the highest personal utility (e.g. in an area with a favourable climate). In this sub-optimal location, the social and environmental factors can outweigh the profit objective. Furthermore, firms may have more than one goal other than the profit maximization. These multi-goals include growth, security, risk minimization, or even oligopolistic strategy (Lever 1985).

The behavioural approach has treated locational choice as a part of the decision-making process within enterprises which comprise pricing decisions, product development decisions, and marketing and production decisions in addition to the location decision. This approach puts firms in the context of interacting with the environment outside and inside the firm. It has provided many insights to locational choice and has challenged many traditional and simple notions of the subject. The behavioural approach to location theory presented above is an attempt to overcome some of the rigid and unrealistic assumptions of neoclassical location theory. The behavioural approach is more realistic

in its recognition of sub-optimal location, multi-goals and the environment in which firms operate.

Although the strength of this approach lies in the insights it provides, it has several weaknesses. Firstly, its power to predict and evaluate the locational behaviour of firms is limited. Secondly, the approach is too general to be of much value in aiding empirical investigations of the location decision. Thirdly the basic question of why firms choose particular locations still remains unanswered (Smith 1981; Wood 1991).

2.3 Structural approach to location theory

According to Smith (1981), the structural approach has arisen as a response to the inability of existing theory to provide a guide for economic development policy and because existing theory fails to explain actual location decisions. The structural approach challenges both the neoclassical and behavioural location theories in the sense that it is a macroeconomic approach and considers disequilibrium as a normal condition which does not comply with either neoclassical or behavioural theories (Storper 1981).

The structural approach to location theory emphasizes the need to understand industrial location within a framework of political economy. Specifically, it has tried to explain the changing geographical distribution of jobs and industries by resorting to the underlying structure of capitalist society, economic and class relations, and conflicting interest between capital and labour. The literature on this approach is too large to review here and a complete review of this approach can be found elsewhere (Smith 1981, Storper 1981 and Lever 1985). However, there are two essential arguments of the structural approach that should be mentioned. The first is that industry creates a specific demand for labour; this demand changes due to macroeconomic fluctuations or due to organizational restructuring. The resultant changes in demand lead to changes in investment patterns, including plant closures, relocations and new plant establishments (Storper 1981). In the second one, the capital-labour relationship is emphasized. In the capitalist mode of production, capital and labour are put together to generate wages for labour and profit for capital, but a growth in one of them is likely to be achieved at the expense of the other. The conflict of interest between the two is even more apparent in large enterprises. Large enterprises often employ their economic and political power to control their workforce. On the opposite side, labour is organized to respond to this control (Lever 1985).

In summary, the development of a theory of location has evolved over time with the behavioural approach being a response to the perceived inadequacies of the neoclassical approach, with the structural approach supplementing the behavioural approach since the latter fails to take into account the effect of macroeconomic and social forces.

3 Conclusion

This appendix has concentrated on two branches of theory, the theory of foreign direct investment (FDI) and the theory of production location. The former explains why firms decide to invest abroad by referring to the advantages inherent in firms ownership. It then explains where (which country) firms invest in by pointing out the location-specific advantages. Finally, it explains why firms choose FDI rather than opting for other alternatives by resorting to the advantages resulting from the internalization of production.

The review of the theory of production location is very useful. It helps to provide an understanding of where firms should locate, particularly in the context of foreign direct investment. After a firm has decided to invest abroad and a certain host country has been chosen, the firm will have to face the question of choosing a specific location. This theory has developed from the early classical contribution by Weber, which has been supplemented and extended several times into the neoclassical theory. The neoclassical theory itself has been supplemented by the behavioural and the structural approaches which are claimed to be more realistic.

Appendix 2 FDI by economic sectors 1988-2006

<i>Sector</i>	Number of projects	Registered Capital	Implemented Capital
<i>Manufacturing</i>	<i>0.68</i>	<i>0.61</i>	<i>0.69</i>
Oil and Gas	0.00	0.06	0.19
Light Industry	0.28	0.16	0.12
Heavy Industry	0.29	0.27	0.24
Food Processing	0.04	0.05	0.07
Construction	0.05	0.06	0.07
<i>Agriculture and Forestry</i>	<i>0.12</i>	<i>0.07</i>	<i>0.07</i>
Agriculture and Forestry	0.11	0.06	0.06
Aquaculture	0.02	0.01	0.01
<i>Services</i>	<i>0.20</i>	<i>0.32</i>	<i>0.24</i>
Post and telecom	0.09	0.03	0.01
Hotel and Tourism	0.03	0.09	0.03
Banking and Financial services	0.02	0.06	0.08
Education and culture	0.01	0.03	0.03
Urban development	0.03	0.02	0.01
Construction of office and apartment	0.00	0.03	0.00
Infrastructure development for industrial zones	0.02	0.06	0.06
Other services	0.00	0.01	0.02
<i>Total</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>

Source: Ministry of Planning and Investment and GSO