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外國直接資對越南的經濟增長的影響

FDI's Impacts on Vietnam's Economic Growth

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ABSTRACT

This thesis focuses on finding a relationship between Foreign Direct Investment and economic growth in Vietnam. Unit root tests, Cointegration test and Toda and Yamamoto non-causality tests were employed in the empirical analysis. Annual time-series data covering the period 1987-2009 was used. With Augmented-Dickey-Fuller (ADF) and Phillip-Perron (PP) Unit root tests, LNFDIR and LNGDPGR variables proved to be integrated of the order of one I(1). Johansen and Juselius Cointegration tests were used to determine the presence or otherwise of a cointegrating vector in the variables. Both Trace and Maximum Eingevalue indicated two cointegrations at 5% level of significance pointing to the fact that the variables have a long-run relationship. To determine the direction of causality among the variable, Toda-Yamamoto (1995) non-causality test was applied. Foreign Direct Investment was found to Granger Cause Economic growth but not vice versa.

Key words: Foreign Direct Investment, Economic Growth.

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ABBREVIATIONS

ADB	Asia Development Bank
ASEAN	Association of Southeast Asian Nations
BOT	Built-Operate-Transfer
BCC	Business Cooperation Contract
DPEs	Domestic Private Enterprises
EVN	Vietnam Electricity Company
FAO	Food and Agricultural Organization
FDI	Foreign Direct Investment
FIEs	Foreign Investment Enterprises
GSO	General Statistic Office of Vietnam
GDP	Gross Domestic Product
GDPGR	Gross Domestic Product Growth Rate
JETRO	Japan External Trade Organization
MPI	Ministry of Planning and Investment
MNEs	Multinational Enterprises
NICs	Newly Industrialized Countries
OLS	Ordinary Least Squares Method
SBV	State Bank of Vietnam
SOCB	State-Owned Commercial Bank
SOEs	State-Owned Enterprises
SUR	Seemingly Unrelated Regression
UNCTAD	United Nations Conference on Trade and Development
VAR	Vector Auto Regression
VCP	Vietnam Communist Party
VEC	Vector Error Correction
WB	World Bank
WTO	World Trade Organization

CHAPTER I: INTRODUCTION

Foreign Direct Investment (FDI) has contributed to remarkable economic growth in a number of developing countries. In general, FDI not only increases the capital stock for the economy but also facilitates technology and knowhow transfer. In other words, FDI can facilitate economic growth (Balasubranyam et al, 1996).

Due to inadequacy resources to finance long-term development in Vietnam, the issue of attracting FDI has been assumed to be an important mission in the strategies being advocated by policy makers from 1986 up to now. The Vietnamese government implemented the reform policy since 1986. Given the low domestic savings in Vietnam before 1986, FDI flows to Vietnam are considered important sources of capital to supplement domestic savings and investment. Since 1987, FDI has averaged about 5 percent of gross domestic product (GDP), accounting for nearly $49 billion in implemented investment (World Bank 2010). This reform policy marked the beginning of Vietnam's fast economic growth. It has resulted in improvement of living standard for Vietnamese people.

With the success of Doi Moi in 1986, the Vietnamese government promotes FDI aggressively trying hard to achieve long-term goal of becoming an industrialized country by 2020. In the early stages, the contribution of FDI to employment growth

was still small but there was a large increase in industrial output. In recent years, FDI inflows not only provide capital but also stimulate export growth. From 1993 onwards, the contribution of the industry sector to GDP is consistently larger than that of the agricultural sector. Therefore, FDI is obviously essential for Vietnam's economic growth.

This study focuses on FDI's impacts on Vietnam's economic growth and tries to examine their long-term relationship by using Toda & Yamamoto Non-Causality test. Thereby, consistent policy proposals can be presented to policy makers. In the following sections of this chapter, we present a brief overview of infrastructure in Vietnam because efficient infrastructure is critical for ensuring well functioning of the economy, as it is an important factor determining the location and success of FDI project. The next section provides a description of FDI inflows and economic growth in Vietnam. Finally, there are the problem statements and study objectives.

1.1 Infrastructure for Development in Vietnam

According to World Bank Growth Commission 2007, Development experience suggests that investing 7 percent of GDP in infrastructure is the right order of magnitude for high and sustained growth. FDI flows have contributed to improving the poor infrastructure in Vietnam.

1.1.1 Physical Infrastructure

Over the last twenty years, the government of Vietnam was able to sustain infrastructure investment at 10 percent of GDP. From 2000 to 2005, the total length of paved roads increased three-fold from 30,000 km to almost 90,000 km. The ratio of rural households connected to electricity grids also increased from 73% to 89% during 2000-2005. However, Vietnam is experiencing more and more infrastructure weaknesses that negatively affect its ability to sustain high economic growth in the long term. Transport and electricity – the two most essential infrastructure activities – appear to be the weakest infrastructure sectors in Vietnam with blackouts and traffic jams occurring more and more frequently. In relation to the maritime transport, the lack of an efficient limited-access highway and freight rail system contributes to the rising costs of inland transports. In *Doing Business 2012*, The World Bank calculated that exporters in Vietnam has to pay USD 580 of domestic costs to ship a 20-foot container from Vietnam, while it only costs Chinese exporters USD 500 and Singaporeans USD 456.

Vietnam has experienced rapid increases in electricity production in the last 20 years. On average, electricity output grew at 14 percent per year during 2001-2007 while GDP grew at 7.7 percent. Nevertheless, electricity supply has still strained to keep up with demand. According to Electricity of Vietnam (EVN), during peak hours,

the capacity shortfall is 1,500-2,000 MW in 2008. As a result, EVN is forced to cut power repeatedly.

According to the latest global competitiveness rankings of the World Economic Forum, infrastructure is nearly the biggest drag on Vietnam's national competitiveness, just after innovation. In addition, The Global Competitiveness Report points out that among various infrastructure sectors, Vietnam is ranked lowest in the quality of fixed telephone lines, mobile telephone lines, air transport infrastructure and roads.

Table 1: International Ranking of Infrastructure for Vietnam

Criteria	International Ranking/ 139
Quality of overall infrastructure	103
Quality of roads	110
Quality of railroad infrastructure	84
Quality of port infrastructure	95
Quality of air transport infrastructure	111
Quality of electricity supply	106
Fixed telephone lines	131
Mobile telephone subscriptions	124
Country competitiveness Index Rank	59

Source: World Economic Forum, Global Competitiveness Report 2010-2011

Vietnam is now entering a stage of development that requires strategic investment in transport infrastructure such as expressways, railways, seaports, and airports, and in energy with an efficient mixture of hydro, coal, and gas power plants. The government often talks about the single biggest constraint which is money.

Indeed, the efficiency factor is more important. The planning and execution of large-scale infrastructure projects is very problematic in terms of project selection, investment coordination and management. During 1997-2007 periods, Vietnam needs five units of capital to generate one unit of growth while other Asian economies (Korea, Taiwan) needed only 2.5 – 3.5 during their rapid growth period (Nguyen et al, 2008).

FDI flows have contributed to improving the poor infrastructure in Vietnam by establishing projects in the areas of power and water supply, and road and port development. Between 1988 and 1999, FDI was used to finance six infrastructure development projects with a total investment capital of USD 1,321.8 million (World Bank 1998). FDI also financed the development of several infrastructure projects in Export Processing Zone and Industrial Zones. Such important investments have contributed to attracting around USD 8 billion of committed FDI to those zones (Pham, 2003).

1.1.2 Social Infrastructure

In this study, physical infrastructure refers to the large physical networks necessary for the function of a modern industrial nation, whereas social infrastructure refers to all the institutions which are required to maintain the economic, health, and cultural and social standards of a country, such as the financial system, the education

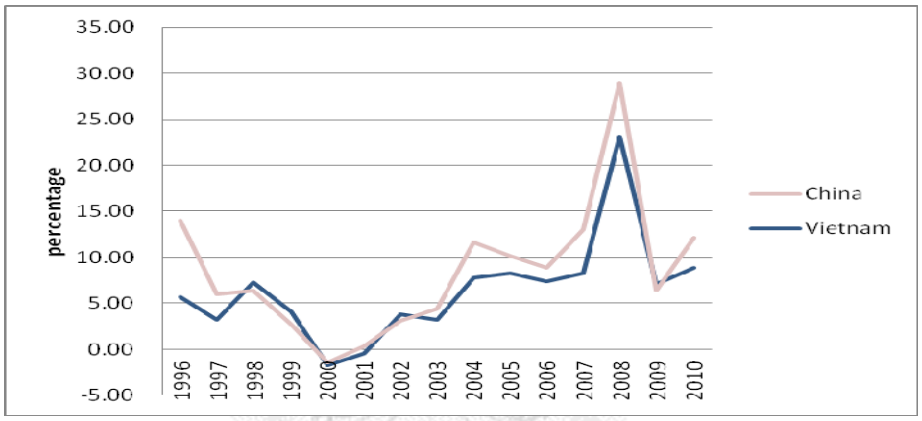
system, the health care system, the system of government, and law enforcement. For sustainable development, social infrastructure and physical infrastructure are both essential to promote economic growth.

The institutional environment is determined by the legal and administrative framework within which individuals, firms, and governments interact to generate income and wealth in the economy. Under the 1992 constitution, the Vietnam Communist Part (VCP) is the dominant political force and the National Assembly is the leading representative institution. However, current shortcomings in developing the legal and judicial system are: the lack of a clear law development strategy; and inadequate institutional framework for effective implementation and enforcement of the law; and the lack of a coordination strategy and action plans. Many administrative procedures are cumbersome and excessively regulated, creating opportunities for abuse of power and corruption by state officials, and the quality of services provided does not yet meet the expectations of people and business.

Vietnam's macroeconomic instability has significantly weakened the country's economic competitiveness and performance these years. It characterized by high inflation rate, large budget and trade deficit and unreliable local currency. Relative to its Asian peers, Vietnam has performed poorly on the key macroeconomic indicators in recent years, especially over the past three years, during which the 2008-2009

global financial crisis. The Vietnamese inflation rate was 13% averaged for 2008-2010, while this respective figure is 2.83% for China, 2.62% for Thailand; 5.45% for the Philippines, and 6.93% for Indonesia.

Figure 1: Inflation Rate's Comparison between Vietnam and China



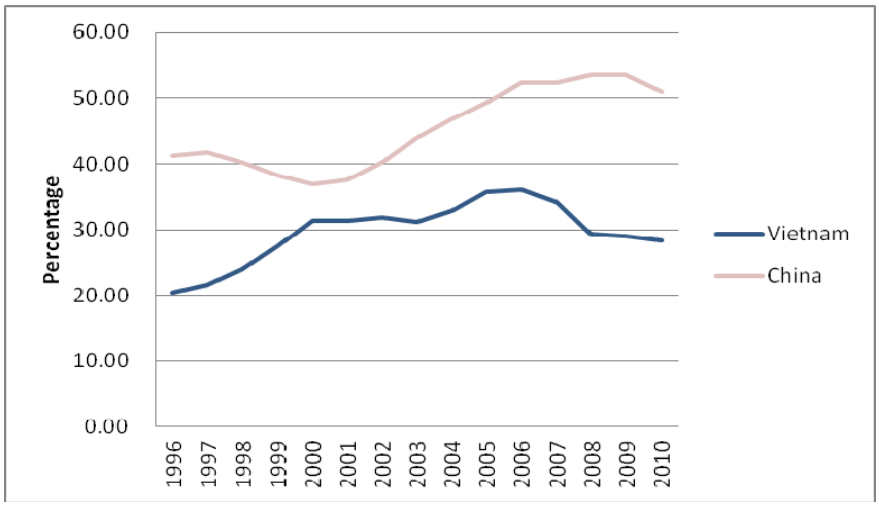
Source: World Indicator Website

On the government budget balance (as a share of GDP), the averages for 2008-2009 and for 2010, are -7.4 percent and -7.8 percent for Vietnam, -1.3 percent and -2.5 percent for China, -2.8 percent and -4 percent for Thailand; -2.4 percent and -2.8 percent for Philippines.

On the Gross savings rate (as a share of GDP), the average for 2008-2010 is 28.9% for Vietnam, while this respective figure is 52.68% for China, 30.74% for Thailand; 25.96% for the Philippines, and 29.83% for Indonesia.

In order to enhance the soundness of its macroeconomic conditions, it is imperative for Vietnam to urgently and effectively address to the root the deficiency in its fundamental development concepts and efforts to build good governance.

Figure 2: Gross Savings Rate's Comparison between Vietnam and China



Source: World Indicator Website

Financial market development: Vietnam has experienced a rapid financial deepening in recent years without suffering any major turbulence, not even during the East Asian crisis. There has been a sustained monetization of economic transactions, a parallel expansion of credit, a rapid growth of stock market capitalization, a gradual emergence of the bond market and a boom in insurance. This progress is all the more remarkable considering that barely more than a decade ago Vietnam's financial sector was simply a "window" to channel resources to SOEs. However, important weaknesses remain, including a still rudimentary approach to monetary policy, a poor quality of banking credit and insufficient surveillance of the stock market.

Human capital: According to Human Development Index 2011, Vietnam scored well in the health component, which is represented by life expectancy, compared to its Asian peers. However, Vietnam needs to do more to improve the education

component where it continues to lag behind many of its Asians peers. For instance, the mean years of schooling is 5.5 and the expected years of schooling is 10.4 for Vietnam, while these figures, respectively, are 5.8 and 13.2 for Indonesia.

Table 2: Human Development Index and Its Components in 2011

	HDI rank	**HDI index** *Value*	**Life expectancy at birth** *(years)*	**Mean years of schooling** *(years)*	**Expected years of schooling** *(years)*	**Gross National Income (GNI) per capita** *PPP 2005$*	**GNI per capita rank minus HDI rank**	**Non income HDI** *Value*
China	101	0.687	73.5	7.5	11.6	7,476	-7	0.725
Thailand	103	0.682	74.1	6.6	12.3	7,694	-14	0.714
Philippines	112	0.644	68.7	8.9	11.9	3,478	11	0.725
Indonesia	124	0.617	69.4	5.8	13.2	3,716	-2	0.674
Viet Nam	**128**	**0.593**	**75.2**	**5.5**	**10.4**	**2,805**	**8**	**0.662**
Lao PDR	138	0.524	67.5	4.6	9.2	2,242	4	0.569
Cambodia	139	0.523	63.1	5.8	9.8	1,848	11	0.584

Source: United Nations, 2011

The entire higher education system is facing several crises, such as outdated curricula, a lecturer-centered method of teaching and learning, a lack of linkage between teaching and research activities, and a large discord between theory and practical training, that leads to a large number of graduates being unable to find a job, while skills shortages drive inflation to double-digit levels. Aside from degrees offered by foreign universities, qualifications from Vietnamese universities are not recognized worldwide. The below table will show the international ranking of social infrastructure for Vietnam in the Global Competitiveness report 2011.

Table 3: International Ranking of Social Infrastructure for Vietnam

Criteria	International Ranking/ 139
Burden of government spending	120
Efficiency of legal framework in settling disputes	61
Transparency of government policy making	73
Government budget balance	126
Inflation	105
Government debt	95
Availability of financial services	87
Ease of access to loans	71
Quality of the educational system	61

Source: World Economic Forum, Global Competitiveness Report 2010-2011

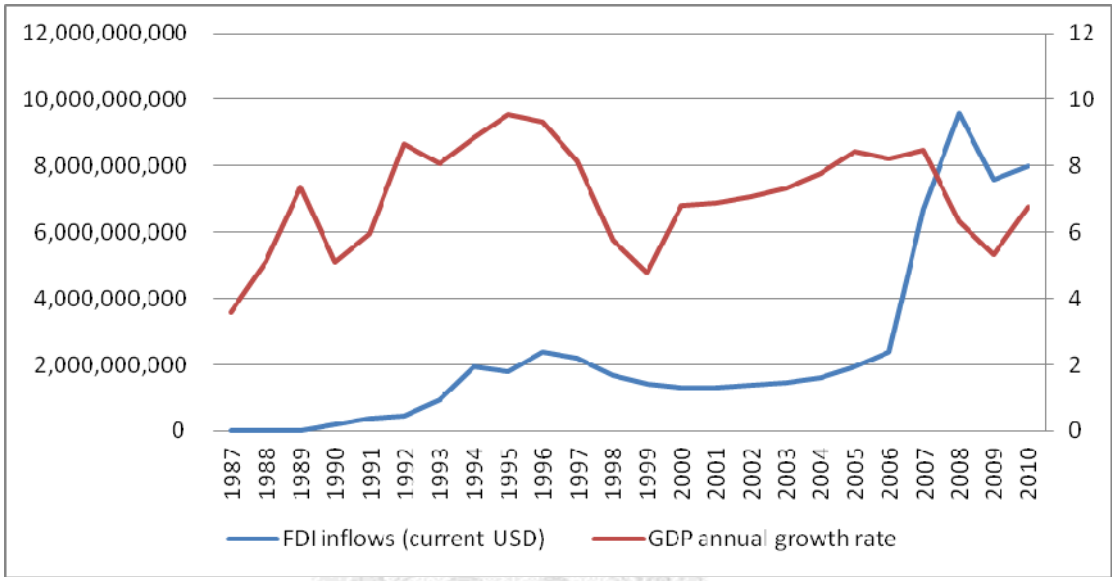
1.2 Economic Growth and Foreign Direct Investment in Vietnam

1.2.1 Trends in FDI Inflows and GDP Growth (1987-2010)

After unification in 1975, Viet Nam implemented two five-year plans (1976-1980 and 1981-1985) to rebuild and develop the economy. This ten year period was characterized by slow economic growth despite some efforts to solve problems arising from the old economic mechanism such as: (i) *agricultural reform*: shifting from a cooperative management system based on work-days to an output contract system; (ii) *reform in prices, wages and money in 1985*: raising prices in the public sector to cope with the market price, increased wages and monetary reform. However, after this reform, the inflation rate in 1986 was 775 per cent so that further changes to renovate the economy were clearly needed: *doi moi* began. The *doi moi* period, since 1986 to date, has had a positive result: during 1986-1990 real GDP growth was on average 3.9

per cent. From 1987, Vietnam started receiving FDI inflow. The historical trend of FDI inflows and GDP growth in Vietnam are shown in the below figure.

Figure 3: Trends in FDI Inflows and GDP Growth (1987-2010)



Source: World Development Indicator, World Bank database.

The five-year plan 1991-1995: Vietnam made comprehensive and radical economic reform efforts on agriculture, foreign trade, foreign investment, finance, SMEs and private sector development, gearing toward a market-driven industrialized and modernized economy. The success of economic reforms has translated into fast economic growth which helped Vietnam get out of the economic crisis by the end of 1992. The economic growth rate averaged at 8.19% per annum during the period 1991-1995.

Table 4: GDP Growth Rates by Economic Sectors and Ownership Forms, 1994 Price

	1991-1995	1996-2000	2001-2005	2006-2009
GDP (% per annum, constant price 1994)	8.19	6.96	7.51	7.05
By economic sectors				
Agriculture-Forestry-Fishery	4.1	4.42	3.38	3.33
Industry-Construction	12.02	10.63	10.25	8.06
Manufacturing	10.35	11.26	11.65	9.61
Services	8.6	5.72	6.97	7.74
By ownership				
State ownership	9.31	7.36	7.46	4.14
Non-state sector	5.05	4.07	6.98	8.15
FDI sector	14.99	17.65	9.93	11.75

Source: Authors' calculations from GSO data.

By ownership, the value-added of the state economic sector attained a high growth rate, reaching an increase of 9.31% per annum compared to an increase of 5.05% per annum of the non-state economic sector. This can be partly explained by the fact that during the period 1991-1995, the non-state sector was still very modest and mainly engaged in the agriculture-forestry-fishery sector. The FDI sector started to emerge with a high growth rate of its value-added of 14.99% in this period, seeing that this sector before that time contributed almost nothing to GDP. From 1987 to 1995, the FDI flow was blurred and very small amount.

The five-year plan 1996-2000: This period Vietnam's economy was severely affected by the Asian financial – monetary crisis in 1997-1998 with a noticeable deceleration of GDP and export growth. GDP growth rates dropped continually, from 9.34% in 1996 to 8.15% in 1997, 5.76% in 1998 and 4.77% in 1999. In 2000,

nonetheless, GDP growth rate went up by 6.79% compared to 1999. For the period of 1996-2000 as a whole, GDP went up on average by 6.96% per annum. The non-state sector attained a slow increase of growth rate of 4.97% per annum, much smaller than that of the national level. On the contrary, the FDI sector experienced a double-digit growth rate of 17.65% per annum on average despite the fact that the FDI inflow was decreased gradually from 1996 to 2000 because of financial crisis. Compared to the non-state sector or the whole economy, the state-sector exhibited a higher value-added growth rate, averaging 7.36% per annum; this figure, however, was just equal to a half of the growth rate of the foreign-invested sector.

The five-year plan 2001-2005: This was a period of drastic economic reforms with many policies to promote SOEs reform, private sector development, investment and trade liberalization as well as deeper integration into the world economy. Vietnam signed the bilateral trade agreement with the United States of America in 2000, which took effect in 2001. The country also engaged in various regional integration agreements such as ASEAN - China Free Trade Area (ACFTA) in 2002. As above-mentioned, the most important turning point of reforms in this period was the promulgation and implementation of the Enterprise Law in 2000, enforcing the right of freedom to do business as provided for in the Constitution in 1992. Accordingly, all individuals have the right to conduct all business activities not

prohibited by law. Then, the Investment Law was approved by the National Assembly in 2005 and marked a major step toward improving the investment environment and creating a level playing field for domestic and foreign investors. The Vietnam's economy attained a higher growth rate in this period compared to the period 1996-2000, averaging 7.51% per annum. The values added of the State and FDI sectors grew by 7.46% and 9.93% per annum, respectively. The FDI inflow in this period increased gradually. The FDI inflow in 2006 was doubled of the one in 2000. It is noted that the non-State sector experienced a much higher growth rate compared to the previous period with an average growth of 6.98% per annum.

The five-year plan 2006-2009: Being a full member of WTO in January 2007 reflected the wider and deeper integration of Vietnam's economy into the world economy. GDP grew relatively fast in both 2006 and 2007 by 8.23% and 8.46% per annum, respectively. In 2008 and 2009, however, the economy was affected by the global economic crisis, so GDP growth rates were lower than those in preceding years, dropping to 6.18% and 5.32% per annum, respectively. The average growth rate of the State-sector only reached 4.14% per annum on average, showing a reduction from the preceding period; this figure was just equal to one half and one-third of those in the non-State and FDI sectors, which grew by an average of 8.15% and 11.75% per annum, respectively. Vietnam entered to WTO in 2007 that was the big force and

reason for a massive FDI inflow into Vietnam in 2008, 9.58 billions. The foreign investors hope that Vietnam can take good advantages when it became a member of WTO. Free trade will promote domestic production in Vietnam especially agriculture and industry.

After the Asian financial and monetary crises, countries in the region have considerably; Vietnam has also changed its FDI policies dramatically. However, there still exist numerous claims from foreign investors about the lack of transparency, consistency, and effectiveness of legal enforcement in Vietnam's law and regulations, despite of the positive changes. These factors increase transaction cost for investors and make Vietnam's investment environment become less attractive than previously, and less attractive than some countries in the region, especially China.

1.2.2 The Role of FDI

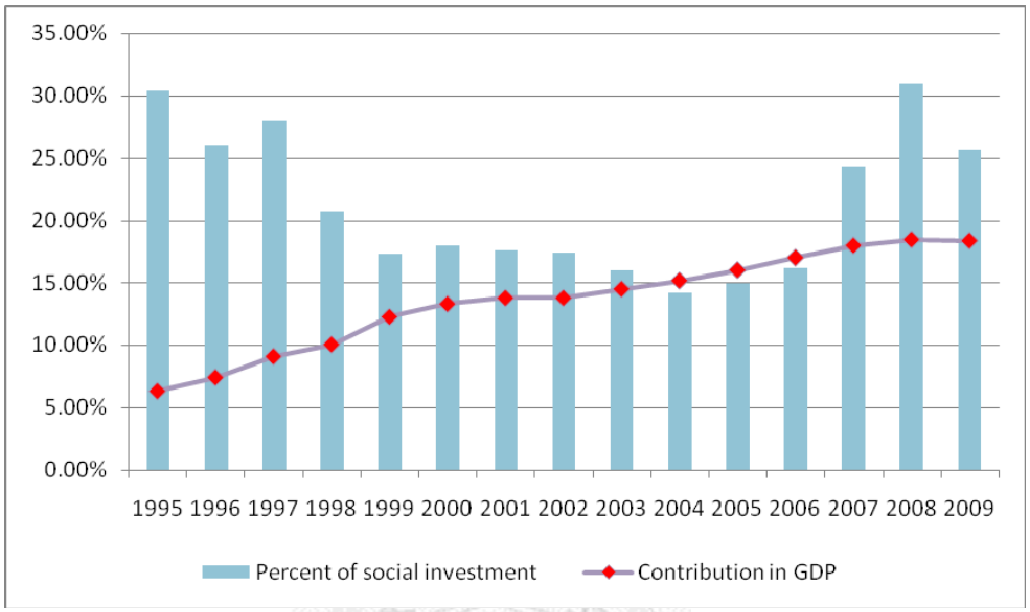
The foreign-invested sector is consolidating its important role in Vietnam's Economy. FDI has been an important supplementary source of funds for gross national investment and improved the balance of payment for the past years. According to recent studies, such as Freeman (2000), MPI (2003), Nguyen Mai (2004), FDI sector is having an increasing share in GDP. This sector also helps to strengthen production capacity and technological innovation in a number of industries,

international market penetration (in particular, increasing export turnover), raising revenues for the States budget and generating employment, etc. In addition, FDI enterprises enable technology transfer and their pressures required domestic firms to renovate their technologies, and to raise production efficiency. Managerial and working skills in FDI projects are also improved, which is a positive and effective channel for spillover effects.

FDI also contributes to stable financing of the current account balance. Vietnam depends on imports for capital goods like machinery and parts, as well as gasoline and petroleum products, and typically runs a current account deficit. However, FDI long-term capital comprises over half of the capital balance, which covers the current account deficit. In addition, Vietnam pursued Economic Renovation (Doi Moi) program from a very low starting point. Therefore, FDI is an important supplement to domestic capital, so as to meet domestic investment demand. As depicted in Figure 4, the share of FDI in national investment has fluctuated considerably, because of up and down changes in FDI inflows on the one hand and changes in investment by domestic investor on the other hand. In the period 1994-1995, the share of FDI in gross national investment hit a record high level of 30 to 31 percent. After that, it gradually decreased and in 2004, implemented FDI only accounted for 14.2% of gross national investment (Figure 4). Then, from 2005 to 2009, it increased again and hit the peak of

30.9% in 2008.

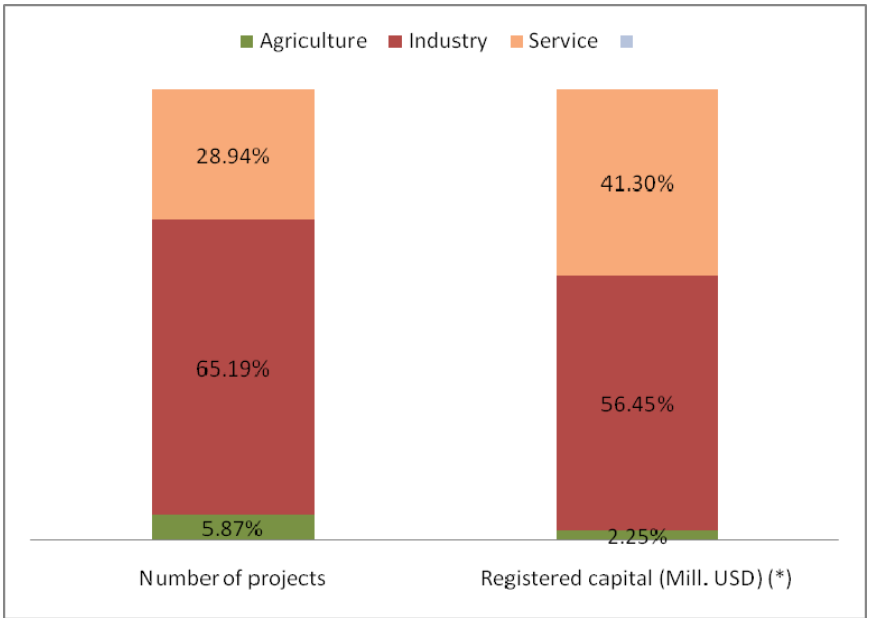
Figure 4: Shares of Implemented FDI in Gross National Investment and FDI Sector in GDP (at Current Price)



Source: GSO website (http://www.gso.gov.vn/default_en.aspx?tabid=471&idmid=3)

The share of FDI sector in GDP has been increasing over the last decade. In 2009, FDI sector accounted for 18.43% of GDP, higher than that of about 6.3% in 1995. In 2010, FIEs accounted for 54 percent ($38 billion) of Vietnamese exports, 39 percent of industrial output (including oil production), and 23 percent (1.8 million) of the nation's business sector employment, which excludes household enterprises and agricultural employment. Besides, foreign-invested sector always has the most rapid growth, making in the most economically vibrant sector so far. The growth rate of this sector is always greater than the country average level.

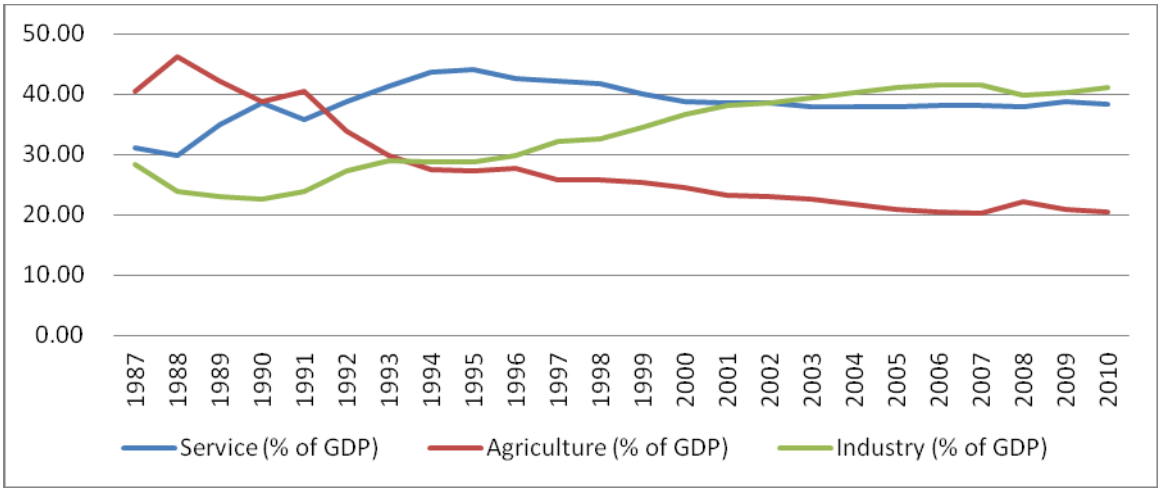
Figure 5: Foreign Direct Investment Projects Licensed in Period 1988-2009 by Kind of Economic Activity



Source: GSO website (http://www.gso.gov.vn/default_en.aspx?tabid=471&idmid=3)

For the use of FDI, FDI projects are mainly implemented in industrial sector, which considerably contributes to shifting economic structure toward industrialization. That's the reason why the Vietnamese government promoted FDI aggressively ahead of long-term goal of becoming an industrialized country by 2020. By the end of 2009, FDI in industrial sector accounts for 65.19% of projects, 56.45% of total registered capital. Meanwhile, FDI in agriculture has been quite modest, in terms of number of projects, registered and implemented capital. The below figure shows a transition in Vietnamese economy; from 1993 onwards, the contribution of the industry sector to GDP is consistently larger than that of the agricultural sector.

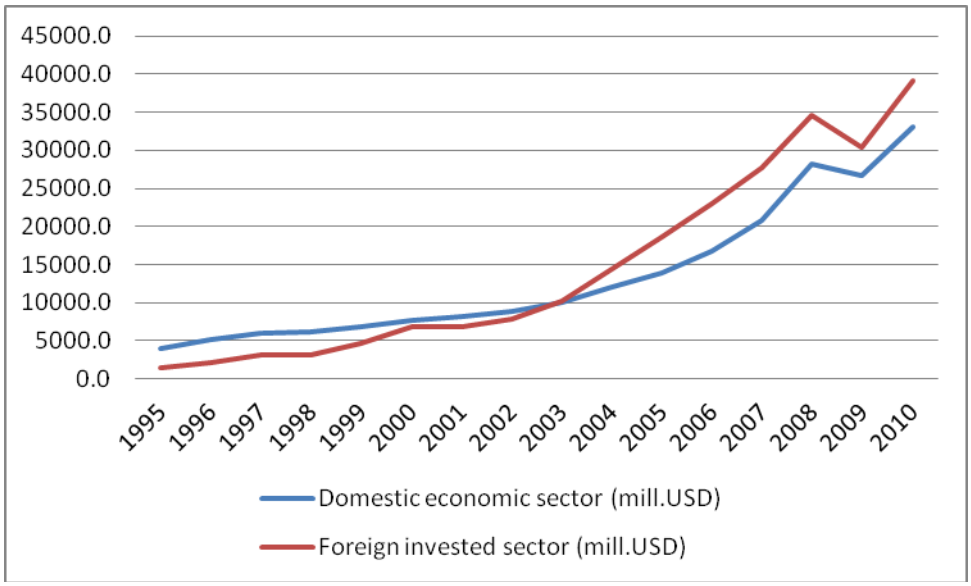
Figure 6: Vietnam's Economic Structure from 1987 to 2010



Source: World Development Indicator, World Bank Database.

FDI created new industries and increased significantly the output of existing industries. In 1998, for example, FIEs produced 100 percent of the output of crude oil, automobiles and monosodium glutamate, 67 percent of television sets, 44.8 percent of glass products, 42.9 percent of steel, and 40.7 percent of garments (Pham, 2003). A notable point is that, while FDI projects concentrate on mining and quarrying as well as import-substitution industries in the 1990s, the number of FDI in processing and export-oriented industries has risen up rapidly since 2000. This is a reason to explain the increase in Vietnam's total export turnover in recent years (MPI, 2003). In the below figure, we can see clearly that FDI sector increases their export value over years. Since 2003, their export value has exceeded the domestic sector's one.

Figure 7: Export of Goods by Economic Sectors (1995-2010)



Source: GSO website (http://www.gso.gov.vn/default_en.aspx?tabid=471&idmid=3)

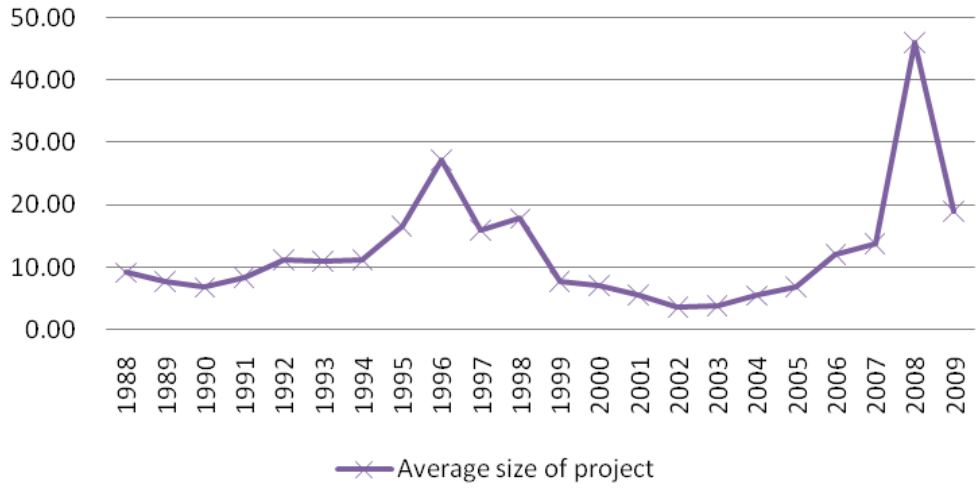
1.2.3 FDI Projects in Vietnam

In 2010, Vietnam attracted $18.6 billion and 969 projects in licensed investment (General Statistical Office 2010). As a share of GDP, Vietnam is the third largest recipient of FDI in the Association of Southeast Asian Nations (ASEAN) region.

Capital size per project: FDI projects in Vietnam are generally of small and medium scales. The average capital size in the period 1988-2009 was only USD 12.56 million. A noteworthy point is that, after reaching a peak of about USD27.32 million in 1996, the capital size per project has been reduced year per year down to about USD5.66 million in 2000 and USD3.71 million in 2002, before rising back to USD7.05 million in 2005. It reached another peak of about USD46.07 million in

2008.

Figure 8: Average Size of FDI Project from 1988 to 2009



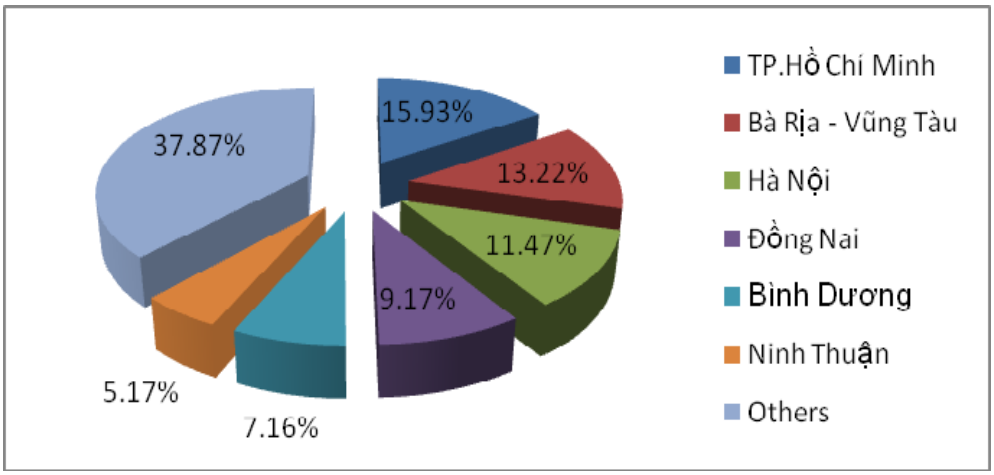
Source: Calculated by data obtained from GSO website

Form of ownership: Due to numerous reasons including the restriction of establishing wholly foreign enterprises, till mid 1990s, the FDI projects registered in Vietnam mainly took the form of joint venture between State-Owned Enterprises (SOEs) and foreign investors. By the end of 1998, joint venture enterprises have accounted for 59% of total number of projects and 69% of total registered capital. In 1997, the above restriction was removed, which has considerably affected the composition of FDI projects by forms of ownership. Since then, the share of joint ventures in total registered capital has fallen to 42.5 % for current time and 45.5% for wholly foreign enterprise. BOT and business cooperation contract account for the remaining shares. In addition, the number of joint ventures between foreign investors and non-SOE firms also increases dramatically. Recently, the major form of FDI

investment is 100% foreign owned, following is joint venture. Specially, from 2006, 100% foreign owned are significantly larger than joint venture so that, in terms of capital invested, the bulk is still in the form of the former. The four remaining forms of FDI investment (BCC, joint stock, BOT–BTO–BT and Parent – affiliates) share a modest number of projects.

Investment location: Up to now, FDI projects have been present in 63 cities and provinces of Vietnam. However, the composition of FDI projects by region has changed very slowly. The majority of FDI projects are located in urban areas and industrial zone, with favorable infrastructures, sizeable and skilled labor force. During the 1988-2009 periods, Ho Chi Minh, Hanoi, Dong Nai, Ba Ria – Vung Tau, Ninh Thuan and Binh Duong, attracted USD120.8 billion in total, accounting for 62.13 % of total registered capital, and 70.74% of FDI projects in Vietnam. The implemented/ registered capital ratio in these provinces reached 51.4%, which was higher than the country average. The other provinces just accounted for 37.87 percent of total registered capital of FDI. However, many provinces have actively and positively improved their investment environment, and some have been successful, such as those in the neighboring areas of Hanoi and Ho Chi Minh cities.

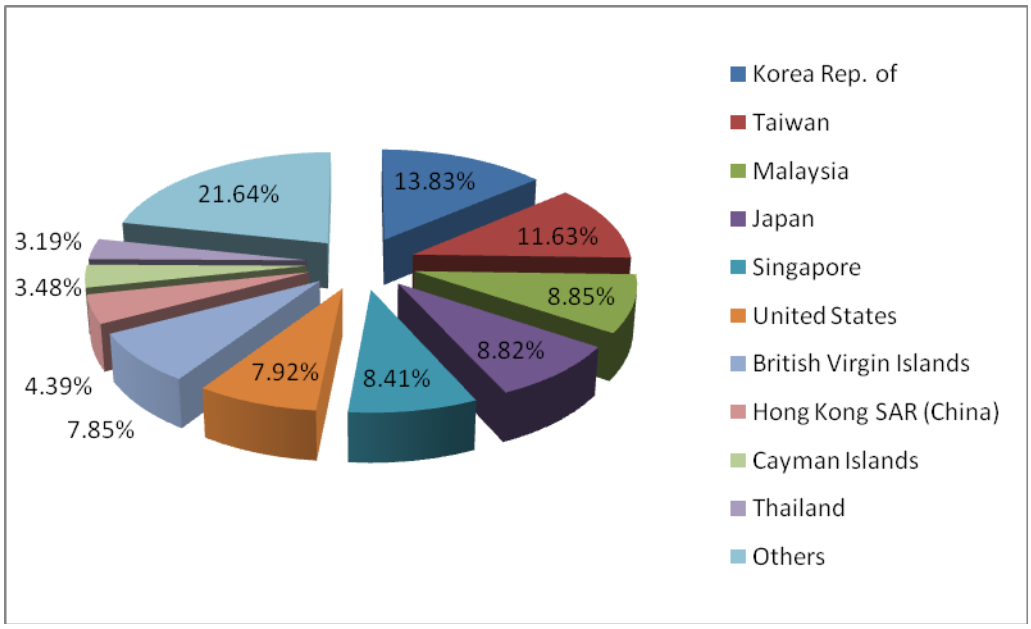
Figure 9: FDI Distribution by Region from 1988 to 2009



Source: GSO website (http://www.gso.gov.vn/default_en.aspx?tabid=471&idmid=3)

FDI inflow by country: So far there have been 41 countries have FDI projects established in Vietnam, of which Korea, Taiwan, Malaysia, Japan, Singapore are major investors, with total shares of 58.31% of projects and 51.53% of total registered capital. There has virtually been no change in the composition of FDI by source country. Asian countries are still dominant in terms of project and registered capital, while European partners are only modest. Investment from US, which has risen considerably after the signing of Vietnam- US Bilateral Trade Agreement (2001), only make up 4.68% of projects and 7.92% of total registered capital.

Figure 10: FDI Projects Licensed in Period 1988-2009 by Top Ten Counterparts



Source: GSO website (http://www.gso.gov.vn/default_en.aspx?tabid=471&idmid=3)

1.3 Problem Statements

In nearly 25 years of *Doi Moi*, Vietnam has made a number of amazing socio-economic achievements. For the past decade, Vietnam has been among the rapidly growing economies, with sharp poverty reduction, in the world. The foreign-invested sector has been recognized as an official part of the economy with increasing contribution to GDP, which was estimated to be roughly 17.95% during 2006-2009 periods. Besides, this sector also creates more employment, increases export turnover, helps to shift domestic economic structure, and raises revenue to the State Budget. Vietnamese government believes that FDI will have a strong positive impact on economic growth. Therefore, they seem to accept the tradeoff between

economic growth and whatever cost it may take. Many incentives are provided to FDI investors generously. Nevertheless, does FDI really have a positive long-term impact on economic growth? Is the FDI-led-growth hypothesis true for Vietnam? These questions lead me to this topic. To test this hypothesis, I applied Toda and Yamamoto Non- Causality tests as my methodology. The properties of data will be investigated by Unit root tests and Cointegration test.

The above approach is macroeconomic perspective. It is not new in the literature review on FDI and economic growth. Many panel data, time-series data analyses examined the level of contribution of FDI to macroeconomic growth. Most empirical studies analyzed a large number of countries from across Latin America, Asia, and Africa. The empirical evidence of the level of contribution of FDI to economic growth varies. Carkovic and Levine (2002) showed that no significant relationship exists between the level of FDI inflow and GDP growth rate while Blomsrtom et al (1992) suggested a causal link between FDI and economic growth.

I hope that my thesis provides the assessment of the relations and causality between FDI and economic growth to provide critical value for government policy implementation.

1.4 Study Objectives

This study focuses on FDI's impacts on Vietnam's economic growth and tries to examine their long-term relationship by using Toda and Yamamoto Non-Causality tests. Thereby, consistent policies and solutions can be proposed to policy maker. The study tries to answer the following questions such as (a) What is the current state of FDI and its use in Vietnam? (b) Does there exists a long-term relationship between FDI and economic growth of Vietnam ? and does FDI strongly lead to economic growth in Vietnam? and (c) What are the policy implications?

To answer these questions, the major research goals are:

(i) To investigate the current state of FDI in Vietnam

(ii) To do the empirical study to test FDI's impact on Vietnam's economic growth with time series data for the period 1987-2009.

(iii) To suggest the sound solutions.

The outline of this thesis is as follows: Chapter II is the literature review of FDI and economic growth. Chapter III presents the methodology. Chapter IV provides the quantitative analysis of FDI's impact on economic growth. Chapter V summarizes the main findings of the thesis and then draws out some conclusions and policy recommendations.

CHAPTER II: LITERATURE REVIEW

FDI is thought to be growth-enhancing mainly through the capital, technology and knowhow that it brings into the recipient country. By transferring knowledge, FDI will increase the existing stock of knowledge in the host country through labor training, transfer of skills, and the transfer of new managerial and organizational practice. FDI will also promote the use of more advance technologies by domestic firms through capital accumulation in the domestic country (De Mello, 1997, 1999). Finally, FDI is thought to open up export markets and to promote domestic investments through the technological spillovers and the resulting productivity increase.

In theory there are several potential ways in which FDI can promote economic growth. For example, Solow-type standard neoclassical growth models suggest that FDI increases the capital stock and thus growth in the host economy by financing capital formation (Brems, 1970). Then, in neoclassical growth models with diminishing returns to capital, FDI has only a "short-run" growth effect as countries move towards a new steady state. Accordingly, the impact of FDI on growth is identical to that of domestic investment. In contrast, in endogenous growth models, FDI is generally assumed to be more productive than domestic investment, since FDI encourages the incorporation of new technologies in the production function of the host economy (Borensztein et al., 1998). In this view,

FDI-related technological spillovers offset the effects of diminishing returns to capital and keep the economy on a long-term growth path. Moreover, endogenous growth models imply that FDI can promote long-run growth by augmenting the existing stock of knowledge in the host economy through labor training and skill acquisition, on the one hand, and through the introduction of alternative management practices and organizational arrangements on the other (De Mello, 1997). Thus, through capital accumulation and knowledge spillovers, FDI may play an important role for economic growth.

2.1 Literature Review on "FDI and Economic Growth"

2.1.1 Previous Researches in the World

With increasing attention to economic growth and development, there is a growing group of empirical and theoretical literature that analyzes the impact of FDI on economic growth. Many empirical studies present evidence proving a positive association between these two variables through diverse econometric analysis methodologies. Using a sample of developing countries from Africa, Asia, and Latin America, these studies analyze how and to what degree FDI has an impact on economic growth.

There is an overall agreement that FDI has a positive effect on economic growth,

even though there are some discrepancies about the level of significance of FDI in promoting economic growth by regions and countries in empirical studies. These empirical studies are based on a theoretical framework of a neo-classical growth theory model or an endogenous growth theory model (Weinhold and Nair-Reichert, 2001). However, the complexity in causality of FDI and economic growth, as well as heterogeneity in the significant level of impact of FDI on economic growth still creates conflicting arguments and evidence.

Balasubramanyam et al (1996) claim that the new growth theory suggested by the Romer-Lucas model implies a critical role of FDI in economic growth and emphasizes positive impacts of FDI for stimulating economic growth as follows:

"FDI has long been recognized as a major source of technology and knowhow to developing counties. Indeed, it is the ability of FDI to transfer not only production know-how but also managerial skills that distinguishes it from all other forms of investment, including portfolio capital and aid. Externalities, or spill-over effects, have also been recognized as a major benefit accruing to host countries from FDI."

In sum, they consider FDI as a critical source that stimulates enhancement of human capital and the transfer of new technology. However, in order to create these positive outcomes from FDI in host countries, Balasubramanyam et al (1996) argue that an efficient and conducive economic environment of a recipient country for

economic activities is required. They claim that countries with an export-promoting policy that increases trade openness have a more productive and effective impact from the inflow of FDI on economic growth than countries with an import-substitution policy.

Borensztein et al (1998) examine the correlations between FDI, human capital, and economic growth. They state that the level of human capital in a host country is an important factor in determining the effectiveness of FDI on economic growth. They also state that FDI strongly interacts with human capital in a host country, whereas domestic investment has little interaction with human capital. Through the empirical investigation of 69 developing countries for a period of two decades, 1970-1979 and 1980-1989, using seemingly unrelated regression techniques (SUR), they present two significant characteristics of FDI on economic growth. FDI creates capital spillover effects by increasing domestic investment, which contributes to capital accumulation for economic growth. Another important characteristic of FDI is its higher productivity and efficiency associated with the level of human capital compared to domestic investment (Borensztein et al, 1998). The importance of human capital for economic growth has been emphasized in theoretical and empirical literature. Blomsrtöm et al (1992) also find that the degree of educational attainment is significantly related to income growth from their study of 78 developing countries

and 23 developed countries for the time period of 1960-1985. They claim that the level of enrollment in secondary education and participation rate is the most significant variable that is positively related to economic growth.

In order to measure the magnitude of the impact of FDI on income growth, Blomsrtöm et al (1992) divide 78 developing countries into two subgroups: higher-income developing countries and lower-income developing countries. From this categorization of developing countries based on income level, they find that the level of influence of FDI on income growth depends on the initial level of development of a host country. They suggest that "a certain threshold level of development is needed if the host countries are to absorb new technology from investment by foreign firms". They also perform the causality test in order to examine the direction of the causal link between FDI and economic growth. Their findings suggest a causal relationship from FDI to economic growth exists. FDI plays an important role for technology transfer to domestically owned firms. "Foreign direct investment by multinational corporations (MNCs) is often suggested as a vehicle for the international diffusion of technology" (Blomsrtöm et al, 1992). The effectiveness and magnitude of technology diffusion from MNCs on the host country economy can be measured by analyzing the level of adaptation of new technology in domestic firms' production.

Regarding causality of FDI and economic growth, it is an ongoing debated issue. Hansen and Rand (2006) analyze the causal links between FDI and GDP and the causality of these two variables by looking at a sample of 31 developing countries in Asia, Latin America, and Africa for the period of 1970-2000. They conclude that "When allowing for country specific heterogeneity of all parameters, a strong causal link from FDI to GDP exists" (Hansen and Rand, 2006). Similar to the literature discussed earlier, their empirical research points out that FDI promotes gross capital accumulation as well as that a higher ratio of FDI in gross capital formation creates a positive effect on GDP growth.

However, Hansen and Rand (2006) suggest that there is no variance of the impact of FDI on GDP: "on average, FDI has a significant long run impact on GDP irrespectively of the level of development" (Hansen and Rand, 2006). According to their findings, the impact of FDI does not vary across regions including Africa, Asia, and Latin America. This conclusion completely contrasts the results obtained from the regression analysis by Blomsrtöm et al (1992), which was previously mentioned.

As discussed, there is an inconsistent causality between FDI and economic growth. Whereas previous empirical studies support the conventional view of the role of FDI as a critical factor for economic growth, Carkovic and Levine (2002) argue that there is no statistical evidence for this positive view on FDI for economic growth. Through

the combination of the microeconomic approach analysis of FDI on productivity growth which measures the total factor productivity (TFP), and macroeconomic approach analysis of FDI on GDP growth, they conclude that FDI does not have a positive influence on TFP or GDP. They argue that FDI cannot be viewed as an independent variable for economic growth while disregarding other economic growth determinant factors. Carkovic and Levine (2002) claim that "previous macroeconomic studies do not fully control for endogeneity, country-specific effects, and the inclusion of lagged dependent variables in the growth regression". Thus, these uncontrolled factors result in inaccuracy in the statistical tests. By correcting the factors that used to be uncontrolled in other studies, they perform the simple ordinary least squares (OLS) regressions and dynamic panel procedure with data averaged over five–year periods on 72 countries over the years 1960-95. Carkovic and Levine (2002) conclude that "while FDI flows may go hand-in-hand with economic success, they do not tend to exert an independent growth effect". This finding disputes generally accepted views on the positive influence of FDI on economic growth.

Choe (2003) also examines the causality of FDI and Gross Domestic Investment (GDI) and economic growth by applying the panel VAR model. He argues that GDI rates and FDI inflows play catalyst roles for economic growth through capital accumulation, which is necessary for long-run growth. He analyzes GDI rates and

FDI inflows in terms of their relationship to economic growth. In his empirical study, he tests Granger causality between FDI inflow and GDI rates and GDP growth. From a sample of 80 countries comprising high income OECD countries and developing countries over the period of 1971 to 1995, he concludes that overall causality of FDI and GDI is bi-directional. However, more significant effects are observed from economic growth to FDI rather than from FDI to economic growth.

In sum, the correlation and causality of FDI and economic growth are heterogeneous across countries, and an application of different econometrics methodologies creates variation in test results. In addition, there are still many other variables that can affect the results of empirical studies due to country specification. Therefore, it is critical to understand these variations when examining the relationship and causality between FDI and economic growth.

The below table summarizes the main findings of the literature reviewed.

Table 5: Summary of Literature on FDI-economic Growth Relationship

Author	Type of Data	Countries and Time period	Empirical Approach	Results
De Mello, 1999	Panel data and time series	32 developed and developing countries 1970-1990	Stationarity tests	Only weak evidence for FDI effects on economic growth
Weinhold and Nair-Reichert, 2001	Panel data	24 developing countries 1971-1995	Mixed fixed and random coefficient approach	FDI on average has a significant impact on growth but the relationship is heterogeneous across countries
Balasubramanyam, et al (1996)	Cross-section	46 developing countries 1970-1985	OLS regressions	FDI has positive effect only for export promoting countries
Borensztein et al (1998)	Cross-section	69 developing countries 1970-1989	Regression estimations using SUR technique	FDI has positive effect but its magnitude depends on human capital in host country
Blomsrtöm et al (1992)	Cross-section and panel data	78 developing countries 1960-85	OLS Regressions	FDI has positive effect on growth for only higher income developing countries
Hansen and Rand (2006)	Cross-section and Panel data	31 developing countries 1970-2000	Analysis of causality between FDI ratio and GDP using Granger causality test (indirect approach)	FDI promotes gross capital accumulation as well as that a higher ratio of FDI in gross capital formation creates a positive effect on GDP growth.
Carkovic and Levine (2002)	Cross-section and panel data	72 developed and developing countries	Regression analysis using OLS as well as GMM	FDI inflows do not exert a robust, independent influence on economic growth
Choe (2003)	Panel data and time series	80 developed and developing countries, 1971-1995	Analysis of causality between FDI and economic growth using Granger causality test of Holtz-Eakin	FDI Granger causes economic growth and vice versa but the effects are more common from growth to FDI

Source: Author reviewed and summarized from previous studies

2.1.2 Empirical Studies on FDI and Economic Growth for Vietnam

In Vietnam, despite of the vast literature on FDI, in-depth research on the relationship between FDI and economic growth, especially using quantitative methods, are still limited in number. Among them is Le (2002), which used the time series data for period 1988-2002. He 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 (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, labor 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 labor turnover leading to spillover of technology from FDI firms to domestic enterprises.

Phan and Ramstetter (2006) focus their study on the period 1995-2003. Similarly to Nguyen (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. 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 (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 Two-Stage Least Squares, Three-Stage Least Squares and Generalized Method of Moments 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 (2007) examine the impact of FDI on economic growth for both China

and Vietnam. Different from previous studies on Vietnam, Vu et al (2007) used sectoral-level panel data instead of provincial level data. They adopted the endogenous growth model and modeled the influence of FDI on GDP through labor productivity channel by allowing the coefficient of labor to vary over time. In their empirical specification, however, FDI enters the model to affect growth directly and through its interaction with labor. Their results indicate that FDI has a significant and positive effect on economic growth through labor productivity.

Saji and Nguyen (2010) used a recently released panel dataset that covers 61 provinces of Vietnam from 1996–2005 to examine the link between foreign direct investment and economic growth. Their analysis, which was based on a simultaneous equations model, revealed that in overall terms a mutually reinforcing two-way linkage between FDI and economic growth existed in Vietnam. However, this was not the case for each and every region of Vietnam. Finally, they suggested that the impact of foreign direct investment on economic growth in Vietnam will be larger if more resources are invested in education and training, financial market development and in reducing the technology gap between the foreign and local firms.

The below table summarizes the main findings of the literature reviewed.

Table 6: Summary of Literature on FDI - Economic Growth for Vietnam

Author	Type of Data	Countries and Time period	Empirical Approach	Results
Le (2002)	Time series data	Vietnam 1988-2002	Growth accounting techniques and regression method	FDI contributes significantly to economic growth and stimulate domestic investment
Nguyen (2002)	Panel data	61 provinces 1996-2000	Pooled regression with endogenous growth model	FDI exerts positive impacts on the economic growth rates across provinces.
Phan and Ramstetter (2006)	Time series data	Average values of 61 provinces 1995-2003	Endogenous growth model	FDI is positively related to economic growth. When they include FDI in their growth regression, they found evidence of convergence of per capita growth among provinces in the country.
Nguyen (2006)	Provincial level data	61 provinces 1996-2003	2LS, 3LS and GMM	FDI is found to be statistically significant, an important determinants of economic growth.
Vu et al. (2006)	Sectoral-level panel data	China and Vietnam 1985-2004	Endogenous growth model	FDI had a positive effect directly and indirectly with its interaction with labor on growth in the industrial sector. Other sectors gained very little growth benefit from sector specific FDI
Saji and Nguyen (2010)	Panel data	61 provinces 1996-2005	GMM model	Overall, Two-way linkage between FDI and economic growth exists in Vietnam.

Source: Author reviewed and summarized from previous studies

2.2 Key Reference Studies

My thesis is based on two key empirical studies as follows: Konya and Singh (2006); Frimpong and Oteng-Abayie (2008).

Frimpong and Oteng-Abayie (2008) examined the bivariate causality between FDI inflows and Economic Growth in Ghana by using Toda-Yamamoto (1995) Granger Non-Causality test. The real GDP growth and foreign direct investment net inflows as percent of GDP (FDI ratio) data for the period 1970-2002 were collected from World Bank Database. The entire data was divided into two sub periods of pre-SAP (1970-1983) and post-SAP (1984-2002). These data entered the VAR model under natural logarithm form. Before conducting the Non-Causality test, the Unit root test, Cointegration test were performed. This study found no causality between FDI and growth for the total sample period and the pre-SAP period. FDI however Granger caused GDP growth during the post-SAP period.

Similar to the above study, Konya and Singh (2006) also applied the Toda Yamamoto (1995) Granger non-causality test in their research. They called it *direct approach* of Granger causality test. In addition, another method also was used. It was referred as the indirect approach by which the causality was tested with standard Wald tests within VAR (in levels and/or in first-differences) or VEC model. Their objective was to address the export/import-led growth and growth-driven export/import

hypotheses for India. Variables were the natural logarithms of exports, imports, and nominal GDP from 1951 to 2004. The results showed that exports and imports Granger-cause GDP, both individually and jointly, lending support to the export/import led growth hypotheses.

CHAPTER III: METHODOLOGY

As mentioned in the Introduction, this thesis aims to examine the relationship between FDI and economic growth in Vietnam using the natural logarithms of GDP growth rate, FDI ratio during 1987-2009 periods (23 observations). The direct approach suggested by Toda and Yamamoto (1995) was applied in an appropriately augmented level VAR model.

3.1 Data Collection Method

FDI net inflows as percent of GDP (FDI ratio) and GDP growth were taken from the World Bank's World Development Indicators. Annual time series data covering the period 1987-2009 was available.

With a tight time constraint, I only used secondary data for my thesis. The primary data was not an option here because it could cost money and time.

The data is shown in the table below:

Table 7: FDI Ratio and GDP Growth Rate of Vietnam from 1987 to 2009

Year	FDI ratio	GDP annual growth rate
1987	0.03	3.58
1988	0.03	5.14
1989	0.06	7.36
1990	2.78	5.1
1991	3.9	5.96
1992	4.8	8.65
1993	7.03	8.07
1994	11.94	8.84
1995	8.59	9.54
1996	9.71	9.34
1997	8.27	8.15
1998	6.14	5.76
1999	4.92	4.77
2000	4.16	6.79
2001	3.98	6.89
2002	3.99	7.08
2003	3.73	7.34
2004	3.55	7.79
2005	3.73	8.44
2006	4.02	8.23
2007	9.79	8.46
2008	11.79	6.31
2009	8.44	5.32

Source: World Development Indicator, World Bank Database

http://data.worldbank.org/data-catalog

3.2 Methodology

Nowadays, economists are more interested in using time-series analysis to study the dynamics between FDI and economic growth among countries because of the dynamic effect of the series. For example, the results of time-series analysis depend

substantially on condition of the analyzed countries, the period chosen, and the econometric method used.

In this paper, four common steps of time-series analysis were followed to test for the relationship between FDI and economic growth. *The four steps approached in time-series studies were: (1) Unit roots test (stationarity test), (2) models specification and the lag order of integration, (3) cointegration test, and (4) Causality test* (Gujarati, 2003).

This study has been carried out to find out the linkage between Foreign Direct Investment (FDI) and economic growth in terms of Gross Domestic Product (GDP) for Vietnam over the period 1987-2009. All the tests in this thesis were performed by Eview 5.0 with two variables:

- LNGDPGR: Natural logarithms of GDP growth rate.
- LNFDIR: Natural logarithms of FDI ratio.

In order to perform Toda and Yamamoto Non-causality test, we need to know the optimal lag length in the original VAR system and the maximal order of integration of the variables in the VAR system. However, according to Toda and Yamamoto (1995), their procedure does not substitute the conventional unit roots and cointegration properties pretesting in time series analysis. They are considered as complementary to each other.

Therefore, this empirical study includes following steps:

1. Perform **Unit root tests** with the time-series data of these two variables (ADF test and PP test) for verifying whether our data is *stationary* or not, finding out their *integration order*.
2. Find the optimal *lag length* of VAR model by using **information criteria**
3. Conduct **Cointegration tests** just to find out whether the two variables are bound together in the long run.
4. Perform **Toda and Yamamo Non-Causality test**.

The details of the above tests is described as following

3.2.1 Unit Root Tests

Although a conventional model should be estimated using a system estimator or singe equation approach, it is important to consider the underlying properties of the processes that generate time-series variables because the presence of unit roots in the series normally behave with stochastic trends. *If a series contains a unit root or is non-stationary, then the problem of spurious regression may occur, unless it is combined with other non-stationary series' to form a conintegrated stationary relationship.* Essentially, the unit root test account for stationarity of the series. The two most commonly used unit roots tests in the literature – *the Augmented*

Dickey-Fuller test (ADF) and the Phillips-Perron (PP) – test were employed in this study.

The ADF test was conducted by "augmenting" three equations and adding the lagged values of the dependent variable (ΔYt). The first equation was a pure random walk equation, the second equation was a random walk with drift or intercept, and the last equation was a random walk with drift around stochastic trend. The test either failed to reject null hypothesis for selected series, then series contains unit roots, or it implied that the series in levels were non-stationary and must be modeled in first differences (I(1)), or were stationary. Otherwise, if calculated t-statistics were greater than critical values then the series were stationary and must be modeled in level (I(0)).

In statistics and econometrics, an **augmented Dickey–Fuller test (ADF)** is a test for a unit root in a time series sample. It is an augmented version of the Dickey–Fuller test for a larger and more complicated set of time series models. The augmented Dickey–Fuller (ADF) statistic, used in the test, is a negative number. The more negative it is, the stronger the rejection of the hypothesis that there is a unit roots at some level of confidence.

The testing procedure for the ADF test is the same as for the Dickey–Fuller test but it is applied to the model

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \cdots + \delta_{p-1} \Delta y_{t-p+1} + \epsilon_t \quad (1)$$

where α is a constant, β the coefficient on a time trend and *p* the lag order of the autoregressive process. If α = 0 and β = 0, it is a pure **random-walk** model ("without constant and trend"). If β = 0, it is a **random-walk-with-a-drift** model ("with constant"). If α and β are different with zero, we have a **random-walk model with drift and trend** ("with constant and trend").

By including lags of the order *p* (greek for 'rho') the ADF formulation allows for higher-order autoregressive processes. This means that the lag length *p* has to be determined when applying the test. One possible approach is to test down from high orders and examine the t-values on coefficients. An alternative approach is to examine information criteria such as the Akaike information criterion, Bayesian information criterion or the Hannan-Quinn information criterion. In this study, we use the information criterion do determine the lag length *p.*

The unit root test is then carried out under the null hypothesis γ = 0 *(unit root exists, no stationary)* against the alternative hypothesis of γ < 0 *(unit root does not exist, stationary).* Once a value for the test statistic is computed, it can be compared to the relevant critical value. If the test statistic is less than the critical value, then the null hypothesis of γ = 0 is rejected and no unit root is present. If the test statistics is greater than the critical value, then the null hypothesis is accepted and unit root exists.

Phillip and Perron (1988) generalized and modified DF test procedure. PP test used nonparametric statistical methods for serial correlation in the error term without adding lagged difference terms. On the other hand, the DF test accounted for possible serial correlation in the error term by adding the lagged difference term of the regression (Gujarati, 2003). Both the PP test and ADF test used similar critical values.

3.2.2 Lag Length Selection

A critical factor in the specification of appropriated VAR models is the selection of the lag length. There are several criteria recommended for the most appropriate VAR model (Yang, 2002). Some of the criteria are the likelihood ratio test (LR), final prediction error (FPE), the Akaike information criterion (AIC), the Schwarz information criterion (SC), and the Hanan-Quin information criterion (HQ). *In all alternatives, the model that best fits the data is the one that minimizes the overall sum of squared residuals or maximizes the likelihood ratio.*

Therefore, SIC was used for this study. Accordingly, a bivariate VAR models were developed – VAR models with only two endogenous variables (LNFDIR and LNGDPGR).

3.2.3 Johansen Cointegration Test

Cointegration consists of matching the degree of nonstationsarity of the variables in an equation in a way that makes the error term (and residuals) of the equation stationary and rids the equation of any spurious regression results. Even though individual variables might be nonstationary, it is possible for linear combinations of nonstationary variables to be stationary, or cointegrated. If a long-run equilibrium relationship exists between a set of variables, those variables are said to be cointegrated. If the variables are cointegrated, then we can avoid spurious regressions even though the dependent variable and at least one independent variable are nonstationary.

Engle and Granger (1987) developed the conintegration test method to overcome non-stationary time-series due to unit roots inherent problem. They found that a linear combination of two or more non-stationary series may be stationary, so that, if this stationary linear combination exists then the non-stationary time-series are said to be cointegrated. Thus, the stationary linear combination may be interpreted as a long-run equilibrium relationship among the variables.

This study implemented Johansen's cointegrateion procedure to test for the possibility of at least on cointegrating relationship between LNGDPGR and LNFDIR in bivarite model developed for Vietnam including the Trace and Maximum Eigen

value tests.

The trace test attempts to determine the number of cointegrating vectors between the variables by testing the null hypothesis that r=0 against the alternative that r>0 or r<1 where r is equal with the number of cointegrating vectors. The maximum eigenvalue tests the null hypothesis that the number of cointegrating vectors is equal to r against the alternative of r+1 cointegrating vectors. Thus, if the value of the test statistic is greater than the critical values, the null hypothesis of zero cointegrating vectors is rejected.

3.2.4 Toda and Yamamoto Non-causality Test

In recent researches, there are two approaches for Granger causality test: indirect and direst one. The indirect approaches assumes that the variables are stationary or can be made so by differencing, and causality is tested with standards Wald tests within VAR (in levels and/ or in first-differences) or VEC models. The second approaches suggested by Toda and Yamamoto (1995), referred to as the direct approach requires less pretesting and is applied in a appropriately augmented level VAR model.

In this study, **Toda and Yamamoto (1995) Non-causality test** was chosen due to (as noted by Shirazi and Manap, 2005) following reasons: “a) the standard Granger

(1969) causality test for inferring leads and lags among integrated variables is likely to give spurious regression results and F-test becomes invalid unless the variables are cointegrated, b) the error correction model (Engle and Granger 1987) and the VAR error correction model (Johansen and Juselius 1990) as alternatives for testing of non causality between time series are cumbersome."

Toda and Yamamoto causality test involves estimation of an augmented VAR (k+dmax) model where k is the optimal lag length in the original VAR system, and dmax is the maximal order of integration of the variables in the VAR system. The procedure employs a modified Wald (MWald) test for restrictions on the parameters of a VAR (k), where k is the lag length in the model. The MWald statistic has an asymptotic chi square distribution when the augmented VAR (k+dmax) is estimated. According to Rambaldi and Doran (1996) MWald tests for testing Granger Non-Causality increases efficiency when *Seemingly Unrelated Regression (SUR) models* are employed in the estimation.

Following Seabra and Flach (2005), the T-Y Granger Non-Causality test is implemented in this study by estimating the following bivariate VAR system using SUR technique:

$$LNGDPGR_t = \alpha 1 + \sum_{j=1}^{k+d} B_{1j} LNGDPGR_{t-j} + \sum_{j=1}^{k+d} \delta_{1j} LNFDIR_{t-j} + u_{1t} \quad (2)$$

$$LNFDIR_t = \alpha 2 + \sum_{j=1}^{k+d} B_{2j} LNGDPGR_{t-j} + \sum_{j=1}^{k+d} \delta_{2j} LNFDIR_{t-j} + u_{2t} \quad (3)$$

Where $LNGDPGR_{t-j}$ is the j^{th} lagged variable of $LNGDPGR_t$. $LNFDIR_{t-j}$ is the j^{th} lagged variable of $LNFDIR_t$. α_1 and α_2 are error terms that are assumed to be white noise, u_{1t} and u_{2t} are zero average and stable variance. k is optimal lag length, d is the maximal order of integration of the variables in the system.

From equation (2), "FDIR does not Granger cause GDPGR" if H0: $\delta_{1j}= 0$ against H1: $\delta_{1j}\neq 0$, where $i \leq k$. Similarly, from equation (3), "GDPGR does not Granger cause FDIR" if, H0: $B_{2j} = 0$ against H1: $B_{2j}\neq 0$ where $i \leq k$. The extra (dmax) lags are not restricted in all cases. According to Toda and Yamamoto (1995), this will ensure that the asymptotic critical values can be applied when we test for causality between integrated variables.

CHAPTER IV: EMPIRICAL STUDY OF FDI AND ECONOMIC GROWTH: A CASE STUDY OF VIETNAM

This chapter presents the results of *FDI-led-growth hypothesis for Vietnam* for the period 1986-2009. It consists of three sections: Section 4.1 describes the summary statistics of LNFDI and LNGDPGR during the analyzed periods; Section 4.2 portrays the results of the econometric analysis (Unit roots, Lag selection and Toda and Yamamoto Non-Causality Test) used to test connecting linkages between economic growth and Foreign Direct Investment.

4.1 Descriptive Statistics Analysis

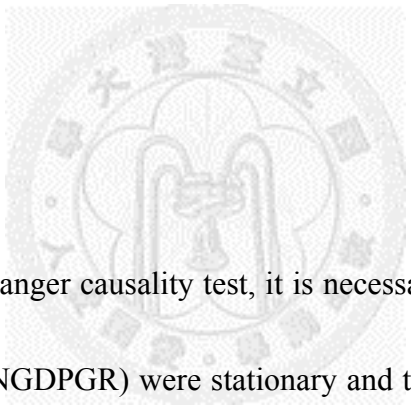
In this thesis, my analysis focuses on two variables: LNGDPGR and LNFDI. Their descriptive statistics were presented as the following table:

Table 8: Summary Statistics

	LNGDPGR	LNFDIR
Mean	7.083043	1.081015
Median	7.34	1.425515
Maximum	9.54	2.479894
Minimum	3.58	-3.50656
Std. Dev.	1.60469	1.780344
Observations	23	23

Source: calculated by author based on the data obtained from World Bank Database

The data on FDI inflows have been inconsistently published among different organizations. There is a significant difference between the data published by Vietnamese government agencies and the data from international organizations. The difference stems from the method of measuring FDI, and the capability of the statistical agency in identifying FDI. Sometimes, the data issued by Vietnamese government agencies has mistakes and not so reliable. For this reason, I chose the data of FDI and GDP from World Development Indicator for my empirical study.



4.2 Statistical Analysis

4.2.1 Unit Root Tests

Before applying the Granger causality test, it is necessary to to test if the relevant variables (LNFDIR and LNGDPGR) were stationary and to determine their orders of integration. The Augmented Dickey Fuller (ADF) and Phillips – Perron (PP) tests was conducted to examine the existence of unit root in each time series. The results of both ADF and PP tests are reported in the tables below:

Table 9: Unit Root Test for Variables under Study Using PP Test

Variable	**Model**	**Level**	**Critical value at 5%**	**First difference**	**Critical value at 5%**	**Integration Order**
LNFDIR	Without constant and trend	-1.604475	**-1.957204**	-3.414425**	**-1.958088**	1
	With constant	-3.724687**	**-3.004861**	-3.582941**	**-3.012363**	0
	With constant and trend	-2.616785	**-3.632896**	-4.077591**	**-3.644963**	1
LNGDPGR	*Without constant and trend*	-0.223679	**-1.956406**	-4.088607**	**-1.957204**	1
	With constant	-2.759198	**-2.998064**	-3.969908**	**-3.004861**	1
	With constant and trend	-2.03053	**-3.622033**	-4.383603**	**-3.632896**	1

Notes: ** indicate significance at 5% levels respectively. Eviews 5.0 was used for all computations.

Table 10: Unit Root Test for Variables under Study Using ADF Test

Variable	Model	Level	Critical value at 5%	First difference	Critical value at 5%	Integration Order
LNFDIR	Without constant and trend	-1.509886	**-1.957204**	-3.414425**	**-1.958088**	1
	With constant	-4.397096**	**-3.012363**	-3.582941**	**-3.012363**	0
	With constant and trend	-3.684989**	**-3.644963**	-3.728414**	**-3.690814**	0
LNGDPGR	*Without constant and trend*	-0.218935	**-1.956406**	-4.126633**	**-1.957204**	*1*
	With constant	-1.942544	**-3.020686**	-4.028224**	**-3.004861**	*1*
	With constant and trend	-1.730758	**-3.658446**	-4.358709**	**-3.632896**	*1*

Notes: ** indicate significance 5% levels respectively. Eviews 5.0 was used for all computations, using SC criteria and lag length = 4.

The above results show that all the variables were not stationary in levels. This can be seen by comparing the observed values of both ADF and PP with the critical

values at 5% level of significance. Therefore, the null hypothesis was accepted and it was sufficient to confirm the presence of unit root in the variables in levels. Following this, all the variables were differenced once and both the ADF and PP test were conducted on them. Then, it found that all the variables were stationary. *This implies that LNFDIR and LNGDPGR were very likely integrated of order one*.

4.2.2 Lag Order Selection

The optimal lag length is important to identify the true dynamics of the model. To determine optimal lag length of VAR system, the sequential modified LR test statistic (LR), Final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SC), and Hannan-Quinn information criterion (HQ) lag selection criteria were applied. The result is reported in the following table. All the information criteria except AIC showed that the optimal lag order should be 1. Judith et al (2003) suggested that the Schwarz criterion for lag order determination is preferable for samples less than 100 observations to preserve some degrees of freedom for the estimations. Therefore, this paper considers the optimal lag length for VAR model to be 1.

Table 11: Lags under Different Criteria for VAR Model

Lag	LR	FPE	AIC	SC	HQ
0	NA	0.378031	4.702745	4.801675	4.716386
1	**23.66970***	**0.122424***	3.56921	**3.866000***	**3.610133***
2	4.673365	0.136475	3.654165	4.148816	3.72237
3	2.828336	0.174146	3.841488	4.533999	3.936976
4	6.880344	0.14127	**3.521449***	4.411821	3.64422
5	2.268441	0.194836	3.641831	4.730063	3.791883

Note: * indicates lag order selected by the criterion; LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion

4.2.3 Cointegration Test

Having confirmed the stationary of the variables at I(1), we proceed to examine the presence of cointegration among the variables. When a cointegration relationship is present, it means that FDI and GDPGR share a common trend and long-run equilibrium as suggested theoretically.

Trace and Maximum Eigenvalue tests were applied to determine the rank of cointegration. If Trace statistics/ Max statistics are larger than critical value, then the null hypothesis is rejected, and failed to reject null hypothesis if otherwise. The result is shown by the following table.

Table 12: Johansen-Juselius Likelihood Cointegration Tests

Hypothesis	Alternative	Trace statistics	Critical value 5%	Max statistics	Critical Value 5%
r=0	r=1	25.64318**	**15.49471**	15.90237**	**14.2646**
r≤ 1	r=2	9.740808**	**3.841466**	9.740808**	**3.841466**

Notes: ** indicate significance at 5% level and r denotes number of cointegrating vectors. Eviews 5.0 was used for all computations. The assumption of deterministic trend of data is: linear deterministic trend in data with intercept (no trend) in CE and test VAR (the third option in Eviews).

For Trace test, the trace statistics was 25.64318 at r = 0 and 9.740808 at r = 1. They were both larger than critical value at 5%. Therefore, it indicated two conintegrations between LNGDPGR and LNFDIR.

For Maximum Eigenvalue test, the max-eigen statistic was 15.90237 at r = 0 and 9.740808 at r = 1. They were both larger than critical value at 5%. Therefore, it indicated two conintegrations between LNGDPGR and LNFDIR.

It appears that there is a long-run relationship between LNFDI and LNGDPGR. Recall that although cointegration between two variables does not specify the direction of a causal relation, if any, between the variables, Econometrics theory guarantees that there is always Granger Causality in at least one direction.

4.2.4 Toda and Yamamoto Non-Causality Test

Toda and Yamamoto Non-Causality test was employed in this study by estimating the bivariate VAR model using the SUR system. It avoids the problems outlined

above by ignoring any possible nonstationarity or cointegration between series when testing for causality, and fitting a standard VAR in the *levels* of the variables (rather than first differences, as is the case with the Granger and Sims causality tests), thereby minimizing the risks associated with possibly wrongly identifying the orders of integration of the series, or the presence of cointegration, and minimizes the distortion of the tests' sizes as a result of pre-testing (Giles,1997; and Mavrotas and Kelly, 2001).

Using the established maximal order of integration (dmax=1) from the above unit root tests and the selected VAR length (k=1) from the above lag order selection, the following augmented VAR (2) model was estimated using the SUR technique:

$$LNGDPGR_t = \alpha 1 + \sum_{j=1}^{k} B_{1j} LNGDPGR_{t-j} + \sum_{j=1}^{k} \delta_{1j} LNFDIR_{t-j} + u_{1t} \quad (4)$$

$$LNFDIR_t = \alpha 2 + \sum_{j=1}^{k} B_{2j} LNGDPGR_{t-j} + \sum_{j=1}^{k} \delta_{2j} LNFDIR_{t-j} + u_{2t} \quad (5)$$

Finally, I conducted the Toda and Yamamoto Non-Causality test using a modified Wald (MWald) test to verify if the coefficients of the lagged variables are significantly different from zero in the respective equation (4) and (5). The result of this test is presented in the table below:

Table 13: Toda and Yamamoto Non-Causality Test's Results

Null Hypothesis	Lag (k)	k+dmax	MWald (X^2stat)	P-values	Direction of Causality
LNFDIR does not Granger cause LNGDPGR	1	1 + 1 = 2	6.433687**	0.0401	*LNFDIR* → *LNGDPGR*
LNGDPGR does not Granger cause LNFDIR	1	1 + 1 = 2	2.215402	0.3303	*LNGDPGR* ↛ *LNFDIR*

Note: The (k+dmax) denotes VAR order. The lag length selection was based on LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schawarz information criterion, HQ: Hannan-Quinn information criterion. ** denotes 5% significance level. "→" denotes one-way causality. EViews 5.0 was used for all computations.

The above results can be summarized as follows. First of all, it suggests that the null hypothesis of 'Granger Non-Causality from LNFDIR to LNGDPGR' can be rejected at the 5% significance level. This indicates the causality from LNFDIR to LNGDPGR. Second, the null hypothesis of 'Granger Non-Causality from LNGDPGR to LNFDIR' cannot be rejected at the 5% significance level. Therefore, a unidirectional causality runs from LNFDI to LNGDPGR, but not vice versa. This supports our theoretical framework in chapter II *"FDI led growth"*.

Following Shan *et al (1997)*, I also estimated the model and tested for causality using other lag orders. The causality test results were significantly the same. According to Pindyck and Rubinfeld (1991), it is best to run the test for a few different lag structures to make sure that the results are not sensitive to the choice of the lag length. *Thus, I may conclude that there is unidirectional causality from LNFDI*

to LNGDPGR in Vietnam for the investigated period, but not vice versa.

In sum, the Unit Root Test suggested that data were non-stationary in their levels and integrated at order one. Then, the information criteria suggest the lag order for VAR model is one. Johansen Cointegration test showed a long-run equilibrium relationship among LNFDIR and LNGDPGR. Finally, Toda and Yamamoto (1995) Non-Causality test implied that Foreign Direct Investment Granger causes economic growth. Therefore, from above analysis, we may conclude that FDI-led-growth hypothesis is acceptable for Vietnam.

CHAPTER V: CONCLUSION AND POLICY RECOMMENDATION

The analysis in above chapters allows me to draw some conclusions and policy recommendations with reservations due to the limits of this study in this final chapter.

5.1 Conclusions and Policy Recommendations

Since the promulgation of Law on Foreign Investment, Vietnam has achieved quite impressive performance in attracting FDI inflows. Together with the magnificent GDP growth, FDI accounts for an increasing share in GDP. This is supposed to result from reform policies that Vietnam has pursued for the past years, while suggesting the interrelationship between FDI and economic growth. In this thesis, I undertook some quantitative analyses in order to check whether FDI and economic growth in Vietnam have a causality relationship in long term or not. If yes, how strong it is? What is the direction of causality between them? To answer this question, I used time series data and several econometric methods related to Granger causality test.

Through Toda & Yamamoto (1995) Non-Causality test, we can see that there is a statistically significant causal link from FDI to economic growth in Vietnam, but not

vice versa. It explained why Vietnamese government tries to promote and attract FDI with the "FDI-led-growth" hope. From this result, my thesis supports the idea that FDI inflow can promote GDP growth. FDI guarantee long-run positive impact on economic growth. Vietnamese government should continue to create a good environment to attract FDI inflows. However, it is crucial to reassess government economic growth policy in Vietnam that heavily focuses on attracting FDI alone without improving much about the infrastructure, institution and other conditions in order to better absorb FDI.

The achievement of economic growth requires more than simply saving and investment in physical capital and then sitting back to wait for the fruits of exogenous and automatic technological progress (Gordon, 2009). From Chapter 1, we know that Vietnam has some characteristics as follows: The overall quality of physical infrastructure is low, about 103th/139 in Global Competitiveness Report. Transport and electricity are the weakest with blackout and traffic jams occurring frequently. This will increase the transaction cost in Vietnam for investors. HDI index is low because of education quality. In general, labors have low skill and low productivity. It's hard to get technical change in Vietnam.

In the poor countries like Vietnam, Governments can encourage growth by promoting education, by building political capital that minimizes diversion (including

theft, corruption), and by developing infrastructure capital. Only by doing that, Vietnam can gain more from FDI and FDI can support long-run economic growth. However, it's important to better manage and invest in public projects. Over the last twenty years, the government of Vietnam sustained infrastructure investment at 10 percent of GDP. In fact, the planning and execution of large-scale infrastructure projects are very problematic in terms of project selection and management. Therefore, the quality of infrastructure is still low now. Corruption and weak institutions also are obstacles for Vietnam to better manage FDI projects and lead it to the right track. While FDI have many positive effects which we can realize easily, it also has some intangible negative effects needed to be restricted.

For FDI-related policies, Vietnam now needs to have a new way of thinking in attracting FDI. In the modern times, quality of FDI projects not the number of projects should be the top priority. Government should pay more attention to environmental cost in order to exchange with some FDI projects. For some environmental damages, we cannot see its consequences right now and cannot calculate its cost. Our next generation will suffer from our decision today.

Recently, Vedan's environmental crime was revealed. The Vedan Vietnam Limited Joint Stock Company, a wholly Taiwanese-invested firm, was established under an investment licence granted by the Ministry of Planning and Investment in August

1991. Vedan used a two-way pumping system to discharge untreated waste water into the Thi Vai River. In the past, inspectors of the Ministry of Natural Resources and the Environment found Vedan polluting the environment and this firm was fined. Dong Nai fined Vedan three times, totaling more than VND20 million ($1,300). In mid 2006, the Environmental Protection Agency under the Ministry of Natural Resources and the Environment found Vedan directly discharging waste water into the Thi Vai River through three pipes. Vedan was fined but it repeated its crime. Minister of Natural Resources and Environment, Pham Khoi Nguyen said "Of the more than 100 industrial zones, up to 80% are violating regulations on the environment. Along the Thi Vai River, not only Vedan is discharging toxic waste water into the river. I don't know whether there is a handshake between the local authorities and businesses or not, but there is a trend that locations only focus on economic development and ignore the environment." According to this, we can see that local authorities give a green signal to FDI investors to invest in their areas. Thus, they can receive "under table money" to ignore environmental problems. It only shows the bad management of FDI projects and the serious situation of corruption in Vietnam.

At this time, Vietnam doesn't have any concept about Green GDP and how to calculate it. It would be better if Vietnam can apply this concept. Our neighbor, China

launched a project, known as “Green GDP” in 2004. It was an effort to create an environmental yardstick for evaluating the performance of every official in China. It recalculated gross domestic product to reflect the cost of pollution. As an experiment in national accounting, the Green GDP effort collapsed in failure in 2007, when it became clear that the adjustment for environmental damage had reduced the growth rate to politically unacceptable levels, nearly zero in some provinces. In the face of mounting evidence that environmental damage and resource depletion was far more costly than anticipated, the government withdrew its support for the Green GDP methodology and suppressed the 2005 report, this had been due out in March, 2007 (Kahn et al, 2007). Independent estimates of the cost to China of environmental degradation and resource depletion have for the last decade ranged from 8 to 12 percentage point of GDP growth. These estimates support the idea that, by this measures at least, the growth of the Chinese economy is close to zero (Elizabeth, 2007). China and Vietnam have many similar characteristics. If the growth of the Chinese economy is close to zero due to cost of environmental degradation, how about the growth of the Vietnamese economy?

Government should increase their attention to the overall of growth (and the quality of growth) as an important determinant of FDI along with the quality of infrastructure, human capital, institutions, governance, and legal framework in

Vietnam. It is not easy task for the government of Vietnam. However, in order to pursue the sustainable development, Vietnam doesn't have any other way.

5.2 Limitations and Suggestions for Future Research

This topic is not new in Vietnam. Many studies were done with the same purpose of investigating relationship between FDI and economic growth but with different aspects and methods. For each one, they require different kinds of data which are not easy to get. With this thesis, I only choose a bivariate model with time series data to solve the problem. This may be incomplete in a sense of economic system. For the future researches, it will be better to add other variables to this VAR model like: export, domestic consumption, domestic investment…

Including previous studies and mine, we all cannot look into the whole picture, what are the causes of economic growth in Vietnam. In this paper, I only take FDI into account but without complete data set, we cannot examine other impacts. Beside FDI, Trade and National Saving or other factors may have bigger impacts on our economic growth. Therefore, in the future, we hope that other authors can fulfill this work and provide good directions for our government.

Although this study has some limitations, it gives a further confirmation for the positive relationship between FDI and economic growth in Vietnam by the new set of data and the new method.

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