Impacts of Foreign Direct Investment on Economic growth in Vietnam

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Abstract

This research determines the impact of foreign direct investment (FDI) on the economic growth of Vietnam (economic) over the period 1990 to 2020 after the political and economic reforms (Doi Moi) in 1986. The study uses the VAR model through unit root test, Granger causality, impulse response, and variance decompositions to achieve the goal of finding the impacts of FDI on economic growth. The study finds that the impact of FDI on economic growth in the short-term and harms the growth for the long-term. Despite the increase of FDI capital over the years and its potential, the effectiveness of FDI is still limited. In this context, this study is written in parallel to provide a systematic study on the determinants of FDI and its potential impacts on the economy of Vietnam.

1. Introduction

The Doi Moi policy in 1986 transformed the market economy, promoting the development of all economic sectors, especially the private sector, and the foreign-invested sectors. According to the Minister of the Ministry of Planning and Investment Portal, the promulgation of the Law Foreign Investment in Vietnam in 1987 created the miracle of FDI, an important contributing factor to Vietnam's economic growth (WorldBank, 2021). The flow of FDI into Vietnam is widely believed to benefit the economy in terms of investment capital, technology transfer, management skills, and job creation. FDI inflow leads to form some key industries of the economy, such as telecommunications, oil and gas, electronics, and information technology, a foundation for long-term growth as well as accelerating the modernization and industrialization of the country. In addition, FDI has contributed to shifting the agricultural structure, raising the value of the agricultural product for export, and creating several new production methods which have improved poor and outdated farming practices and infrastructures in some areas. Accordingly, there have been several papers on the impacts of FDI on economic growth, poverty reduction, and industrial upgrading (Anwar and Nguyen, 2010; Hoang, Wiboonchutikula and Tubtimtong, 2010; Do et al., 2021). However, a trade-off for the enormous amount of foreign funds and the growth opportunities in the economic- society issues such as environmental pollution, unemployment, the domination of foreign enterprises, the localization is low... The reason behind those consequences is the spillover effect is lower than expected and Vietnamese enterprises are still limited in participating in the global supply chain (Anwar

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and Nguyen, 2010). Besides, attracting FDI has been the main occurred policy since the first Law on Foreign Investment in Vietnam in 1987 was issued, thus, the application of the policy is ineffective. Many FDI projects are not suitable for developing planning, technology transfer, and management experience's results are not as expected. As a result, the contribution to the state budget is inadequate. Moreover, the antiquated infrastructure leads to the number of investments from developed countries still low and cannot reach its highest potential.

In this context, this study 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 investigate the impact of FDI inflows on the economic growth of Vietnam after transforming into a market-oriented economy. The study also investigated the performance of Vietnam's economic since the first issued Law on Foreign Investment and at the same time provided some useful suggestions for policymakers to make effective policies about FDI and economic growth. The objective will be achieved by analysing the economic performance of Vietnam since Doi Moi through qualitative and quantitative, identifying whether FDI directly or indirectly contributes to the economic development of Vietnam.

2. Literature review

2.1. Theories about economic growth

To measure the economic status of a country, the *productivity* of one country is a key determinant (Mankiw, 2011). So, economic growth is an increase in productivity or the increased quantity of goods and services, compared from one period of time to another. Traditionally, aggregate economic growth is measured in terms of Gross Domestic Product (GDP) since it measures total income earned by everyone and an item of total expenditure on the output of goods and services in the economy. Moreover, physical capital per worker, human capital, natural resources, and technological knowledge are factors that contributed to economic growth.

The first theory of economic growth is the Neoclassical Growth Theory (or exogenous-growth theory) which first introduced by Robert Solow and Trevor Swan in 1956. The theory states that economic growth is the result of three factors labor, capital, and technology. A standard Solow model predicts that in the long run, economics converge to their steady-state equilibrium and permanent growth as the increase of labor productivity and output capabilities of labor through the technological process. The accumulation of physical capital cannot account for either the vast growth over time in output per person and the accumulation of capital that creates growth in the long run only to the extent that it embodies improved technology (Solow, 1956).

Therefore, the production function of neoclassical growth theory is used to measure the growth and equilibrium of an economy.

$$Y(t) = F(K(t), A(t)L(t))$$

Where: Y output
K capital
L labor
A time or the rate of technological progress which changes over time

According to the exogenous growth model, FDI increases the capital in the host country and that would affect economic growth. Barro and Sala-I-Martin (1995) find that the is a relationship between capital accumulation and output. Moreover, FDI might introduce the new technology which enhances the labor's capability and capital labors, this would then lead further to more consistent returns on investment (De Jager, 2004). The FDI has been proved that stimulating economic growth through augmenting domestic investment (Herzer, Klasen and Nowak-Lehmann D, 2008).

The second economic growth theories is the endogenous growth theory. Endogenous growth theory holds that economic growth is primarily the result of endogenous and not external forces, which is inadequate in explaining the determinants of long-term growth (Barro and Sala-i-

Martin, 2004). Endogenous growth theory holds that investment in human capital, innovation, and knowledge are significant contributors to economic growth. The theory also focuses on positive externalities and spillover effects of a knowledge-based economy which will lead to economic development (Romer, 1994).
In open economies, according to Prior endogenous growth models, the long-run rate of economic growth is impacted by three comprehensive channels. The first channel is trading, the innovation as well as R&D investment increase thanks to the increase in the size of the market. Secondly, economic openness leads to information exchange and raises the productivity of researchers and the field of knowledge spillovers. Finally, there is trade openness (Khder Aga, 2014). Hence, FDI is assumed more effectively than domestic investment as the shift of human capital, management, and technology spillovers (Romer, 1994; Barro and Sala-i-Martin, 2004; De Jager, 2004). As the result, foreign investment can increase the productivity of the host economy, and then FDI can be seen as a catalyst of domestic investment and technological spillover.

2.2. Theoretical studies about the impact of FDI on economic growth

FDI theoretically promotes economic growth in various ways (Herzer, Klasen and Nowak-Lehmann D, 2008). Firstly, FDI can affect economic growth through capital accumulation by introducing new goods and foreign technology which come from the exogenous growth theory (De Mello, 1999). Secondly, based on endogenous growth theory, FDI can promote economic growth through research and development in the host country.
According to Zhang (2001), FDI could enhance the economic growth of host countries and both of them are positively interdependent. The rapid growth of FDI makes positive effective growth through foreign countries' extra facilities such as managerial skills and better technology. FDI offers developing countries abundant required resources such as technology, capital, and entrepreneurial abilities which decrease poverty, create new jobs and industrialize the developing countries (Athukorala, 2003).
Besides, according to modernization theories about the influence of FDI on developing countries, FDI is expected to have positive effects on economic growth in host countries needing capital investment. Since FDI is a source of capital, an extreme level of the capital gap in the host countries is provided to maintain the economic growth which leads to demand for more FDI (Zhao and Du, 2007). In addition, FDI influences the growth based on the quality of the economic and social environment of host countries which are related to technological growth, savings rates, and the degree of openness in the host countries (Akinlo, 2004). Hence, FDI is considered an important vehicle for technology transfer and contributes to economic growth more than domestic investment (Borensztein, De Gregorio and Lee, 1998).
However, FDI still harms growth. The entry and presence of multinational enterprises (MNEs), shifting capital freely due to FDI activities, distributed the existing equilibrium in the market (Blomstrom, Lipsey and Zejan, 1994). The imbalance in investment, investing in effective return sector instead of sectors that the host country wants, can lead to inefficient investment, overexploited natural resources distorted economic structures, slow improvement, and dangerous general instability of the socio-economic life of the country receiving investment when sudden capital withdrawal (Moon and Roehl, 2001). The "transfer pricing" also happens which leads to reducing the effectiveness of state management in the implementation of calling investment to develop the social economy (Barry, 2005). This is also the reason for the increasing trade deficit because the amount of foreign currency used to import raw is always larger than the amount of foreign currency exported (Fontagné, 1999). Nonetheless, the existence of the foreign firms would gradually become direct or potential competitors with local businesses in the same investment field. In the long-term, domestic

firms would be faced with a narrow market or be acquired because of advanced technology, capital, and brand (Zhou, Li and Tse, 2002). Many studies show the concentration of FDI projects in urban areas inhibits the development of domestic enterprises (Azam, 2009). However, the quality of technology transfer within FDI might be outdated, especially in developing countries (Glass and Saggi, 1998). The investors take advantage of the weakness in technology inspection and management of the host country to bring to these countries outdated, depreciated equipment and machinery and technology prices, instead of transferring advanced technology as expected by receiving countries, yet still recognized at high prices (Clapp, 2007). Besides, MNEs have an incentive to prevent the spillover of technology to other companies through trademarks (Dunning and Rugman, 1985).

In short, the impact of FDI on economic growth attracts much attention from researchers and the results are still being debated. FDI can promote the economic growth of a country through introducing new technology and foreign countries' extra facilities as well as providing more capital for the host countries. Despite its positive impacts on the growth, FDI can have negative impacts such as inefficient investment, overexploited natural resources, transfer pricing, trade deficit, narrowing the domestic market size, and importing the outdated technology.

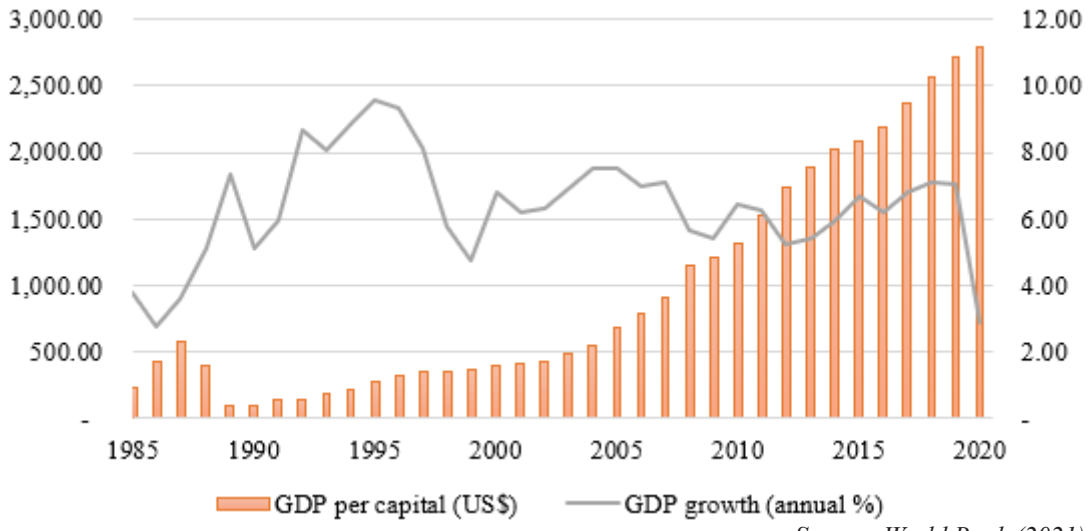
2.3. Emprical studies on FDI and Economic growth

Empirical country-specific studies also show mixed results on the impacts of FDI on economic growth. Time series regression is used by numerous studies to provide and explain the impact of FDI on economic growth. For instance, the relationship between FDI and economic growth in Greece over the period 1960-2002 suggested that there is a long-run equilibrium relationship (Dritsaki, Dritsaki and Adamopoulos, 2004). The positive impact of FDI on economic growth was also found in Cambodia from 2006-2016 (Khun, 2018). Besides the positive relationship between FDI and economic growth, there are some studies' results that show the insignificance between the two variables. Charkraborty and Basu (2002) show that FDI plays no significant in the short-run adjustment process of GDP, yet reverse causality the strong evidence of GDP causing flow for India during the period 1990-2000. There is also no causality between FDI and growth in Ghana over the period 1970-to 2002 (Frimpong and Oteng-Abayie, 2006).

In the case of Vietnam, Nguyen (2017), using annual times series data for the period 1986-2015, found that FDI has a significant positive impact on economic growth in Vietnam in the long run yet no impact in the short run. A positive impact was also found while analyzing during the period 2000-2018 through the OLS method (Nguyen, 2020). Other studies also find the same result. The positive impact can be via investment channels and have both direct and indirect impacts on the growth (Le, 2007). Using the VAR model for the 1995-2019 period, Le (2021) found FDI inflow has a negative impact on growth immediately then FDI inflows have a relatively small impact and have the strongest positive impact in the medium-term and then weaker in the long run. The impact of the long-term effectiveness of foreign investment in Vietnam also raises the concern in Hoang and Duong's paper (2018). These empirical studies have show that there exits a link between FDI and economic growth. Depend on the types of model, variables, time period, scope and location of research, different studies may indicate varying degree of linkage between FDI and growth. In Vietnam, data used in quantitative researches either up to 2015 or in the specific periord, thus, this study may likely to be the first to explore the relationship between FDI and economic growth in Vietnam with the full data from 1990 to 2020.

3. The actual impacts of FDI on the growth of Vietnam

3.1. Overview of Vietnam's economy



Source: World Bank (2021)

Figure 1: GDP per capita and GDP growth of Vietnam from 1985 to 2020

In 1986, Vietnam launched a political and economic renewal campaign "Doi moi" that introduced reforms to facilitate the transition from a centralized economy to a socialist-oriented market economy. Doi moi combined government planning with free-market incentives and encouraged the establishment of private business and foreign investment, including foreign-owned enterprises. During the transition from a backward, subsidized economy to a modern socialist-oriented market economy, Vietnam has risen to become a growth bright spot in the region and the world with notiable achievements. The economy has not only grown in size, but the quality of growth has also been improved, and the people's material and spiritual life has been significantly improved (WorldBank, 2021).

Economic growth reached a high rate. After the first period of renovation (1986-1990), the average annual GDP growth rate was only 4.4% and reached 8.2% in the next five years (1990-1995). Although the GDP in the late 1990s was lower than the previous 5-year period, following the 1997 Asian Financial Crisis, the success of the business and agricultural reforms ushered in under Doi Moi was evident. In the period 1996- 2000, the GDP growth rate reached 7% and poverty was nearly halved compared to the previous period (World Bank, 2021).

Vietnam had an average GDP growth of 6.9% a year from 2000 to 2005. The growth was 7.5% in 2005, the third-largest in Asia, trailing only China's (14.2%) and India's (7.9%). The average GDP growth in the two next periods 2006-2010 and 2011-2015 declined to 6.32% and 5.91%, respectively. The Financial crisis of 2007-2008 led to a decrease in GDP growth in 2008 (5.6%) and slow growth during the post-financial crisis (2011- 2013). The GDP growth of Vietnam in 2010 was 6.42% then decreased to 6.24% in 2011 and 5.25% in 2012. The average GDP in the period 2016- 2019 reached 6.8%, reaching the target of average growth of 6.5% to 7% of the 5-year plan 2016- 2020. Although in 2020, the economy was heavily affected. Despite the Covid-19 epidemic, the economy still grew by nearly 3%, being one of the rare countries with positive growth in the region and the world (World Bank, 2021).

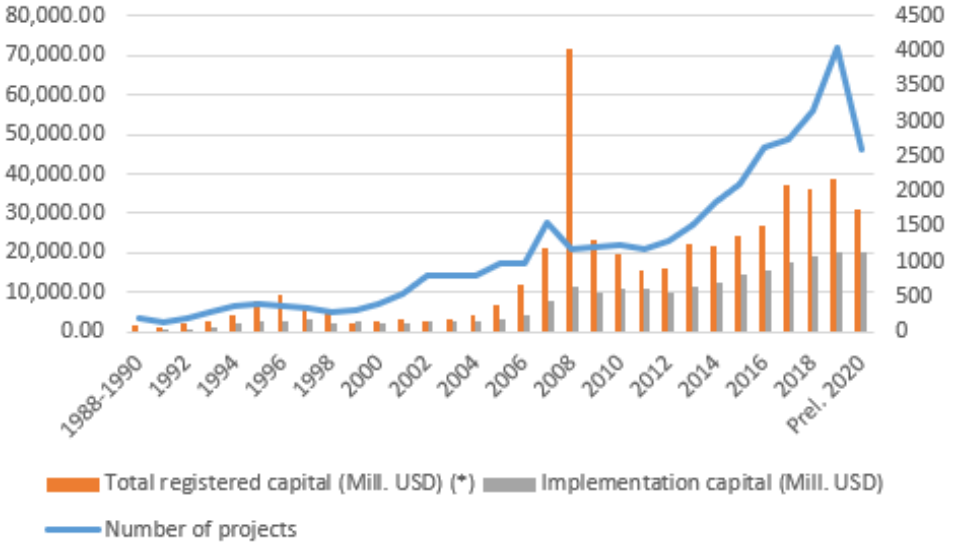
In conclusion, the scale of the economy was significantly expanded, and the material and spiritual life of people has been significantly improved and helping Vietnam to escape from being a poor and undeveloped country and belonging to middle-income countries in the world since 2008. GDP reached about 262 billion USD in 2019, an increase of 18 times compared to the first year of renovation is

about 2,800 USD/person (World Bank, 2021).

3.2. Overview of FDI

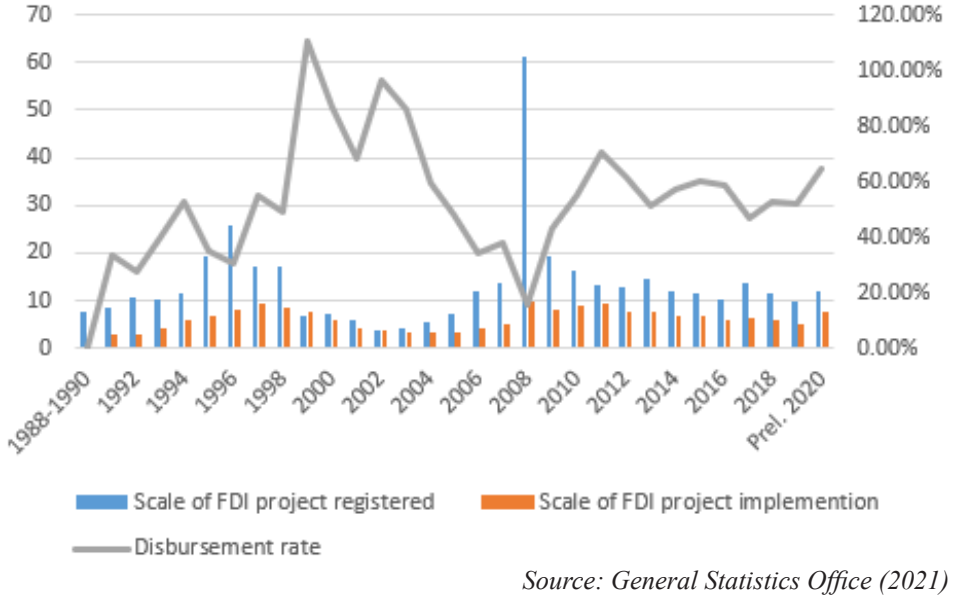
3.2.1. FDI inflow and used

Since its appearance in Vietnam, the FDI enterprise sector has gradually asserted itself as the most dynamic economic development sector with an ever-expanding capital scale in Vietnam. Expect the unusual fluctuations in the period 2008-2009, FDI inflow has skyrocketed and the size of FDI capital tends to increase over the years. In 2020, despite the crisis caused by COVID-19 having a strong impact on the global supply chain, the total registered capital by foreign investors in Vietnam still



Source: General Statistics Office (2021)

Figure 2: Foreign direct investment projects licensed in the period 1988-2020 by Year



Source: General Statistics Office (2021)

Figure 3: Scale of FDI project registered and implementation and disbursement rate during 1988-2020

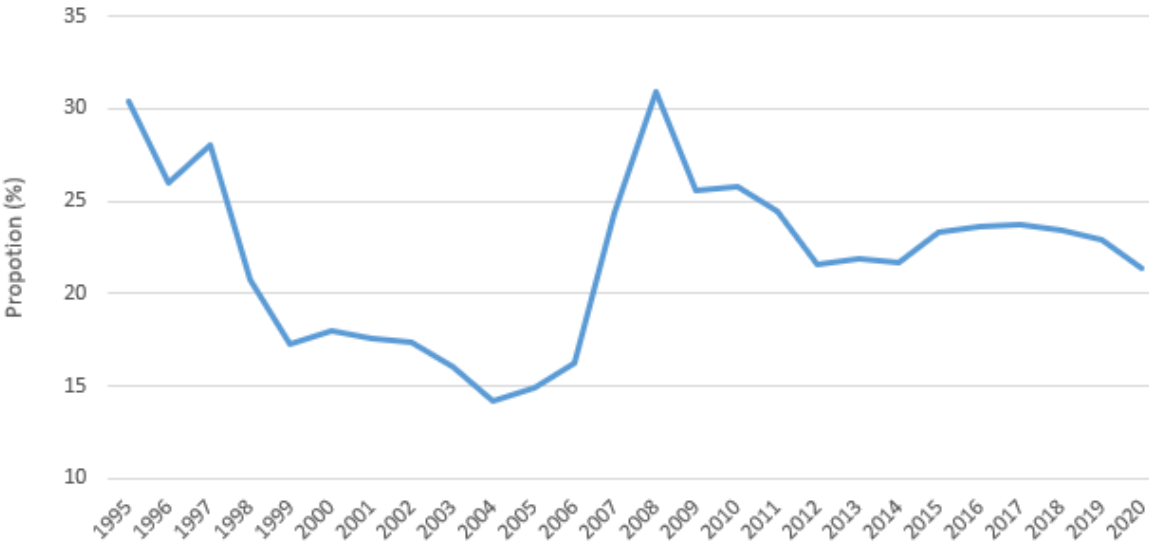
reached 31 billion USD. FDI capital continues to maintain positive results in 2020, showing that the section of foreign investors for Vietnam is an attractive and safe destination.
Beginning in 1991, a massive wave of foreign investment poured into Vietnam. For the whole period of 1991-2000, 3,133 projects were attracted with a total registered capital of 43.9 billion USD. Although the number of projects and total registered capital reduced during 1996-2000 as the result of the 1997 Asian financial crisis, the results of attracting FDI in these early years laid the foundation for later policy changes, creating the great achievement that FDI brought to the Vietnamese economy. The policy adjustment (usually right before and right after international integration events) and Vietnam's economic integration process significantly influenced the registered FDI capital. With the validity of the Law on Investment 2005 and the event of Vietnam's accession to the WTO, the period 2005-2008 was the boom period of registered FDI. The total registered FDI capital increased by more than 1.5 times compared to the previous years. Especially, in 2008 alone, the registered and additional FDI capital exploded, reaching 71.76 billion USD, equal to 71.97% of the total registered capital of the previous 20 years combined.
Along with joining several new trade agreements and reformed Foreign Investment Law and Investment Law 2014, reduce the restriction on business and investors and the third wave of foreign investment took place. In the 2011-2019 period, the implementation capital reached about 143 USD billion, equaling 6.93 times in the 1991-2000 period and 2,45 times the previous 10 years (2001-2010), the average value of attracting 14,3 billion USD per year. In 2019, the total projects reach a peak at 4028 projects and the implementation FDI is estimated at 20 billion USD, the highest since the Doi Moi policy in 1986. However, this year also witnessed a decrease in the scale of FDI project capital from 11.55 million USD per project in 2018 to 9.67 million USD per project in 2019.
From 1995 to 1999, the scale of the FDI project significantly increased. The average scale of FDI in this period was 19.79 billion USD per project. The reason for this phenomenon is the lifting of the embargo on Vietnam from the United States in 1994 did not prevent other countries from lending money to Vietnam. Besides, the scale average of FDI in 1999-2005 was 5.76 billion USD per project. This might be the consequence of the Asian Financial crisis and Vietnam's shift in industrial policy to encourage export. The peak of the scale of registered capital of the project in 2008 (reached a record of 61.25 billion USD per project) yet the scale of the implemented project is still quite modest, only 5.65 billion USD, corresponding to the disbursement rate of only approximately 25%. The scale through period shows the reaction of foreign investors to the change in policies, investment, and business environment in Vietnam and international conditions. The stable and continuous raise of scale since 2009 reflected the balance of the investment environment as well as the expansion of trade bilateral and multilateral commitments.
In the last 10 years, the average disbursement rate was 57.7% which can cause either registering for incentives or financial shortcomings of FDI enterprises. There are long-term issues in Vietnam that only focus on the scale rather than the investment structure as well as the investment performance of foreign investors. It can understand that FDI enterprises heavily depend on loans or link with other enterprises to implement projects. In addition, some firms are taking advantage of low-interest rates and borrowing money from Vietnamese banks to quickly implement project expansion rather than depend on external capital (Vietnam News Agency, 2018). Thus, the proportion of FDI in these projects is pretty small and the goal of attracting FDI to the economy has not been implemented properly. The low disbursement rate also reflects the ability to absorptive capacity is limited.

3.2.2. The impacts of FDI in Vietnam
Before the reform, the ability to accumulate capital within the economy was still limited

while the need for investment capital for development was still large. In that situation, foreign investment is the solution and brings the country out of the lack of capital and plays a decisive role in the success of the economic growth goals.

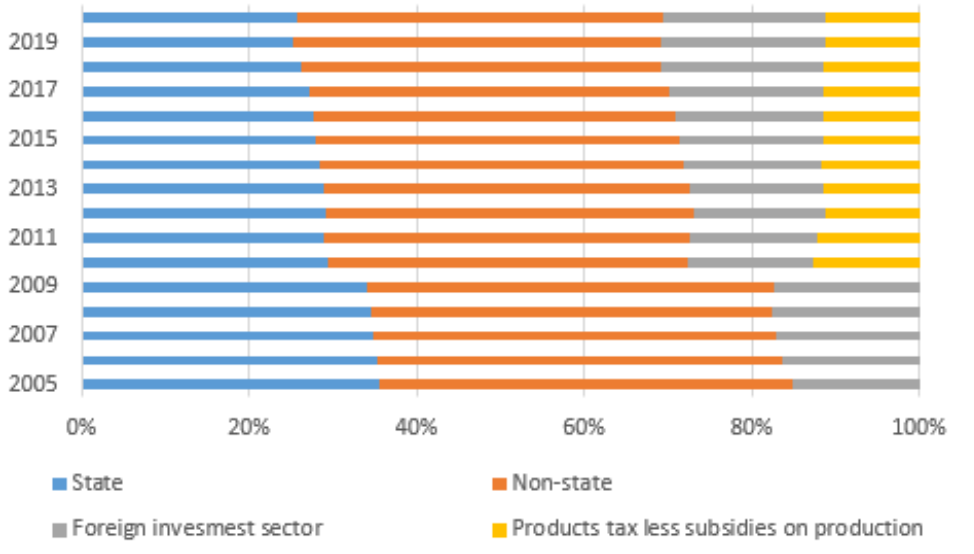
FDI inflows into Vietnam have achieved many remarkable results. According to UNCTAD's Global Investment Report (2021), Vietnam's ranking in FDI attraction has improved markedly. From nearly zero in 1987, in 2000, Vietnam ranked 45th out of 216 countries in terms of FDI attraction. Vietnam's ranking declined in the period 2001 to the time of WTO accession in 2006, then quickly regained its form and increased from 2007. Since then, Vietnam's ranking in FDI attraction has continuously improved over the years. In 2020, Vietnam ranked 19th out of 216 in FDI attraction.

Since the Financial Crisis 2007-2008, the proportion of FDI capital in total social investment has increased and maintained at 21.4% in 2020



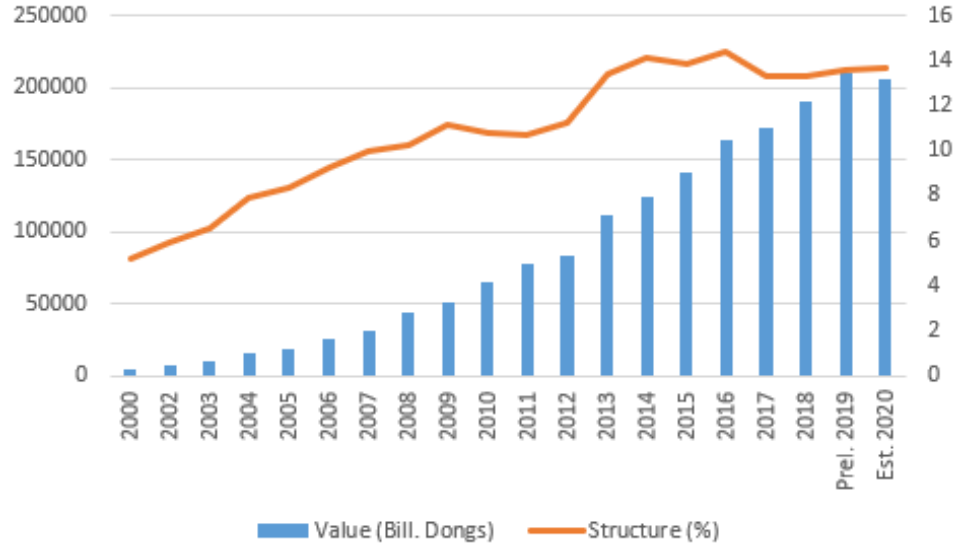
Source: General Statistics Office (2021)

Figure 4: The proportion of foreign investment from 1995 to 2020



Source: General Statistics Office (2021)

Figure 5:The contribution to GDP at current prices by types of ownership



Source: General Statistics Office (2021)

Figure 6: State budget revenues from foreign-invested enterprise

despite the pandemic. The average in the last 10 years was 22.8%. FDI is increasingly showing its role as an important source of additional capital for the economy. This is reflected in the proportion of this type of capital in total social investment capital and its contribution to Vietnam's economic growth which has increased over the years.

According to APO Productivity Databook 2020, nearly 60% of Vietnam's economic growth is the quantity of investment capital. While Vietnam's domestic capital is still limited, it can be seen that the country's economic growth depends largely on the contribution of the quantity of foreign investment capital, including FDI. Since 2005, the FDI sector has always contributed to GDP above 15% which shows the significance of FDI inflows to Vietnam's economic growth.

Besides, the state budget revenues from foreign-invested enterprises have witnessed upward trends since 2000. The state budget revenues in 2020 are estimated at 206.088 billion VND, 43.52 times higher than in 2000 (4,735 billion VND. During the 2016-2020 period, the total revenues from FDI sectors were approximately 941 billion VND which was even higher than the total revenue from 2000 to 2015 (808 billion VND).

However, the contribution of FDI to state budget revenues is still low compared to the proportion of FDI to total social investment. It can be explained by the Government's incentive policy through income tax in the first year of operation and during the difficult period, hardly have profit and loss. Hence, the FDI enterprises take advantage of those benefits for evading taxes through transfer pricing. 55% of FDI enterprises report continuous losses for many years despite investing and expanding production and business as well as the increase in their revenues. (Cam Tu, 2021). For example, Coca-Cola Vietnam continuously declares losses by reporting the high cost of raw materials directly imported from the parent company at a very high price. Coca-Cola Vietnam is not the first company to use transfer pricing tricks. Previously, a series of FDI enterprises such as Metro, Pepsi Vietnam, Adidas, Keangnam Vina... were also detected and arrears by the Vietnamese tax authorities.

4. Methodology and data

4.1. Research Design

The author uses the model based on the Solow-Swan growth model or neoclassical growth

Table 1. List of variables

Variable	Abbreviations	Methodology	Measurement
Gross Regional Domestic Product	GDP	$(GDP_t - GDP_{t-1})/GDP_t$	GDP Growth (annual %)
Foreign Direct Investment	FDI	Total FDI implementation capital	% of GDP
State Investment	GINV	State capital/GDP	% of GDP
Non-state investment	PINV	Non-state capital/GDP	% of GDP
Labor focus	LABO	Percentage of employed workers at 15 years of age and above	% of total populations ages above 15

Source: Collected by the author from General Statistics Office of Vietnam

model, which has been discussed above. The essence of the model is a neoclassical aggregate production function, usually in the form of a Cobb-Douglas model, allowing the model to be linked to microeconomics. This model is proposed to explain long-run economic growth by studying the process of capital accumulation, labor or population growth. Besides, the human capital variable is also included as several include it as a determinant for spillover of the FDI. Variables in the model are included in the following Tables 1.

4.2. Methodology

This research accesses qualitative research methods: by using a combination of methods such as statistics, synthesis, interpretation, comparison, and inductive. The quantitative research method measures the linear relationship between the variables in the model. The author uses Eview 11 to obtain lag optimal-order selection statistics for Vector Auto-regression (VARs). Granger causality test is also used. Then, the researcher uses Impulse Response to analyse the impact of the shock of each variable on the remaining variables and variance decomposition to analyse the importance of each variable in explaining the change of variable.

4.3. Data collection

Data used in this study are annual figures that cover the period between 1990- 2020 which is time-series data using a single linear regression model to examine the impact of FDI on economic growth. The data is from 1995 since the Law on Foreign Investment in Vietnam

Following Solow-Swan model and the above variables the model analysis, Granger's Reoperation Theorem is be adopted as the following form:

$$\begin{bmatrix} GDP_t \\ FDI_t \\ GINV_t \\ PINV_t \\ LABO_t \end{bmatrix} = \begin{bmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \\ \beta_5 \end{bmatrix} + \sum_{i=1}^{n} \begin{bmatrix} \varphi_{11}^i & \varphi_{12}^i & \varphi_{13}^i & \varphi_{14}^i & \varphi_{15}^i \\ \varphi_{21}^i & \varphi_{22}^i & \varphi_{23}^i & \varphi_{24}^i & \varphi_{25}^i \\ \varphi_{31}^i & \varphi_{32}^i & \varphi_{33}^i & \varphi_{34}^i & \varphi_{35}^i \\ \varphi_{41}^i & \varphi_{42}^i & \varphi_{43}^i & \varphi_{44}^i & \varphi_{45}^i \\ \varphi_{51}^i & \varphi_{52}^i & \varphi_{53}^i & \varphi_{54}^i & \varphi_{55}^i \end{bmatrix} \begin{bmatrix} GDP_{t-1} \\ FDI_{t-1} \\ GINV_{t-1} \\ PINV_{t-1} \\ LABO_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{t1} \\ \varepsilon_{t2} \\ \varepsilon_{t3} \\ \varepsilon_{t4} \\ \varepsilon_{t5} \end{bmatrix}$$

where: $growth_t$ is measured by the percentage of GDP growth for a country at time t;
FDIit represents the scale of FDI inflows into the economy at the time t;
$GINV_t$ represents the total capital of the state at time t, compared to current prices
$PINV_t$ represents the total capital of non-state at time t, compared to current prices
$LABO_t$ represents the percentage of labor focus at time t
ε_t the observation error

Table 2. Variables Descriptive Statistic

	GDP	FDI	GINV	PINV	LABO
Mean	0.064200	0.058251	0.154842	0.842579	0.767736
Median	0.064232	0.058300	0.157678	0.933432	0.766600
Maximum	0.093400	0.097131	0.214159	1.480751	0.779500
Minimum	0.029058	0.033904	0.105433	0.377669	0.756300
Std. Dev.	0.012254	0.018277	0.035450	0.319204	0.006595

Source: Result obtained from Eview 11

had been performed and in the first five years, FDI did not have a significant impact on the growth. Besides, not until 1996, did some data was collected such as state and non-state investments. The data used is secondary data which is taken from the General Statistics Office of Vietnam.

4.4. Descriptive Statistics

Table 2 shows the descriptive statistics of each variance. In the first column, we see that the highest GDP of Vietnam during the observed period was 9.34%, and the lowest value, at 2.9%. Those values show the possibility of economic growth in each period of Vietnam is different and tends to be fluctuated. Besides, the labor focus rate is always about 75% of the total population from 1990 to 2020.

5. Empirical result and discussion

5.1. Granger Causality Test

One approach to examining the relationship between interacting variables is to look at the causality among these variables. Granger (1969) designed a statistical test, called the "Granger causality test," to determine whether one-time series is useful in predicting another time series. The null hypothesis of "no Granger causality" is tested with a version of the *F* test. Table 3 presents the significant result for the causality test.

The researcher considers the *p-value < 0.05 (*significant level 5%), and the null hypothesis of "no Granger causality" is rejected highly significantly for

(i) There is no causality between growth and FDI (p = 0.022 and p = 0.019)

Table 3. Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
D(FDI,2) does not Granger Cause D(GDP)	22	6.14935	0.0227
D(GDP) does not Granger Cause D(FDI,2)		6.56921	0.0190
D(GINV) does not Granger Cause D(GDP)	23	0.94213	0.3433
D(GDP) does not Granger Cause D(GINV)		1.17404	0.2915
D(PINV) does not Granger Cause D(GDP)	23	5.32746	0.0318
D(GDP) does not Granger Cause D(PINV)		2.33531	0.1421
LABO does not Granger Cause D(GDP)	23	0.39513	0.5367
D(GDP) does not Granger Cause LABO		0.51081	0.4830
D(GINV) does not Granger Cause D(FDI,2)	22	5.19647	0.0344
D(FDI,2) does not Granger Cause D(GINV)		8.57508	0.0086

Source: Results obtained from Eview 11

(ii) Non-state capital does not have an impact on growth (p = 0031)
(iii) There is no causality between the state capital and FDI (p = 0.034 and p =0.008)
From the result, it is shown that in the short term, FDI has a positive impact on economic growth in Vietnam. After more than 30 years, FDI capital has become an important part of Vietnam's economy and has made many contributions to the development of the country, economic restructuring, improving industrial production capacity, making a significant to budget revenue and job creation, making an important contribution to Vietnam's export turnover and participating in the expansion of international markets. Besides, state and non-state capital (or domestic investment) is always an important internal force to promote economic growth in Vietnam and stabilize macro-regulation. The efficiency of the domestic capital has been increased over time hence, Vietnam's investment Law is necessary to have a priority on promoting domestic savings over capital FDI because of the long-term role of domestic investment in the Vietnamese economy. Furthermore, FDI has an impact on the state capital and has to overcome the capital shortage and stimulate economic growth through the addition of domestic capital and have a positive impact on the growth, same evident in China (Tang, Selvanathan and Selvanathan, 2008).

5.2. Variance Decomposition Using Colessky Factors

The variance decomposition techniques can be utilized to examine the relationship among variables (Kim and Seo, 2003). The forecast error variance allows us to make inferences over the proportion of movement in a time series due to its shocks versus shocks to another variable in the system.
Within a ten-year forecasting horizon, the variance decomposition reported some main results:
(i) In the first year, the innovations in GDP are explained by non-state capital (19%) and then FDI (11%). However, since the second year, FDI explains the second largest innovations (28%) besides its past (52%). In the second year, the state capital also increased from 0.6% to 1.76%.
(ii) GDP also shows great influence on FDI, at 12% in the second year and 16% in the third year, comparing other variables, less than 5%.
(iii) The influence of both GDP and FDI are also witnessed on the state capital and the

Table 4. Variance decomposition

Variance Decomposition of D(GDP):

Period	S.E.	D(GDP)	D(FDI,2)	D(GINV)	D(PINV)	LABO
1	0.035985	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.050560	66.06632	11.28120	0.607544	19.82450	2.220427
3	0.056754	52.44788	28.12117	1.762073	15.90310	1.765775
4	0.057463	53.25067	27.43470	1.796322	15.69312	1.825190
5	0.057866	53.12038	27.43216	1.813630	15.83230	1.801526
6	0.058157	52.59722	28.01697	1.844639	15.71715	1.824018
7	0.058235	52.57549	27.95869	1.839710	15.76137	1.864730
8	0.058259	52.56085	27.98171	1.838216	15.74861	1.870614
9	0.058277	52.53093	27.98453	1.837113	15.76598	1.881446
10	0.058289	52.51494	27.98237	1.837805	15.77744	1.887438

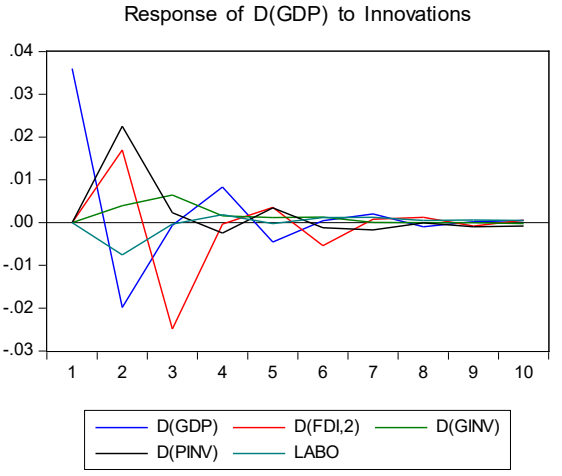
Variance Decomposition of D(FDI,2):						
Period	S.E.	D(GDP)	D(FDI,2)	D(GINV)	D(PINV)	LABO
1	0.016487	3.455289	96.54471	0.000000	0.000000	0.000000
2	0.018208	12.37576	86.83011	0.289515	0.470725	0.033893
3	0.019438	16.98739	78.18111	0.270540	4.020878	0.540078
4	0.019987	16.26797	78.96584	0.368610	3.883916	0.513672
5	0.020060	16.50158	78.74879	0.367813	3.869576	0.512236
6	0.020115	16.72198	78.36534	0.370085	4.015460	0.527128
7	0.020146	16.68976	78.39278	0.376215	4.013812	0.527439
8	0.020151	16.69850	78.38366	0.376135	4.013636	0.528070
9	0.020153	16.71059	78.36716	0.376266	4.017855	0.528129
10	0.020155	16.70954	78.36619	0.376424	4.019235	0.528611

Source: Result obtained from Eview 11

impact of GDP is significantly higher in the first year and reduces in the second year, both variances explain at around one-third.
The result variance decomposition shows that domestic capital also plays an important role in Vietnam's economic growth as its influence is less than FDI. The relationship between economic growth and FDI is bidirectional, but the role of economic growth on FDI is weaker than vice versa. FDI has an impact on state capital but not as much as economic growth. The result also shows that the present and past values of these economic indicators have a strong influence on their future values and trends in each period. Based on this method of assessing those relationships, the Vietnam government can have flexible policies in attracting investment in the short term.

5.3. Impulse responses

The impulse response function is used to reveal the dynamic causality relationship between variables. The impact of shock on GDP itself is strong. GDP has reverted to its mean level after an immediate sharp decline. This confirms that the GDP level of Vietnam depends greatly on its past values. The effect of FDI on GDP is stronger after 1.5 years then falls sharply to



Source: Result obtained from Eview 11

Figure 7. Impulse responses to shock in GDP

have a negative impact in the medium-term when the impact will be the strongest. In the long term, the impact of FDI is hardly to be witnessed. Meanwhile, the investment capital of the private sectors has an immediate and strong impact on economic growth, then impacts gradually in the medium term, while public investment has a stable impact in the short and medium-term.

6. Conclusion

GDP and FDI have a bi-directional causality relationship yet FDI only maintains growth in the first stages but after that, it can negatively impact growth. The reason for that is that most of the investment capital flows into industries that cause bad effects on the environment such as heavy industry, chemicals, and industries that depend on foreign investors do not transfer technology. The development of these industries inadvertently affects the investment environments. The negative impact of FDI in the long-term has been found in much research in Vietnam in different periods (Hoang and Duong, 2018; Le, 2021)

Domestic investment has a greater impact on growth than FDI. The impact of FDI on the efficiency of economic growth is still modest compared to domestic investment which is the same result as Le (2020) and Tang, Selvanathan, and Selvanathan (2008). Besides, the empirical analysis also finds the bi-directional causality link between GDP and domestic investment. Hence, Vietnam may face a capital shortage in new industries where FDI was a complement to domestic investment and domestic investment was limited and export demand may decrease. Vietnam's domestic firms have been dominated by foreign firms which will slow down Vietnam's economic growth . Therefore, encouraging and promoting domestic saving should take precedence over attracting FDI in designing and executing investment strategies and investment policies since domestic investment has a greater contribution to growth than FDI (Tang, Selvanathan and Selvanathan, 2008). On the basis of the result, the study suggests the following recommendations: effectively exploiting domestic capital sources to promote economic growth. According to the analysis, the domestic investment has a greater contribution to growth than FDI. Hence, encouraging and promoting domestic savings should take precedence over attracting FDI in designing and executing investment strategies and investment policies in Vietnam. The study cannot avoid limitations. The data are provided by a secondary official source from the General Statistics Office of Vietnam, which the quality of data is unable to control. Besides, with the scope of the paper, the research has not been comparing the FDI policies systems in Vietnam in each period as well as with other countries in areas. The researcher expects to fulfill those limitations in further research. ■

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