

Article

Debunking the Myth of Foreign Direct Investment toward Long-Term Sustainability of a Developing Country: A Transaction Cost Analysis Approach

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Received: 30 July 2019; Accepted: 16 August 2019; Published: 22 August 2019



Abstract: This study focuses on the relationship between foreign direct investment (FDI) and sustainability in a developing host country, i.e., Vietnam, using the transaction cost approach. Secondary panel data were obtained from 62 provinces in Vietnam for the period between the years of 2010 and 2016. The analysis of the data was performed using the fixed effects regression model, which yielded interesting and controversial findings. Essentially, it was demonstrated that the FDI made by enterprises and the subsequent employment that it generated had several positive and significant influences on the long-term sustainability of provinces in Vietnam. However, the downside was that the value of fixed assets and long-term investment of FDI projects in conjunction with the size of the provinces negatively influenced their long-term sustainability. The findings of this study have important academic and practical implications. We propose some policy changes that would considerably improve the efficacy and effectiveness of FDI. This, in turn, will certainly enhance the long-term sustainability of host countries, especially developing ones.

Keywords: FDI; foreign direct investment; transaction costs; sustainability; province; developing country; Vietnam

1. Introduction

Foreign direct investment (FDI) has become an inevitable trend of globalization and an indispensable need of every country, especially developing ones. It is recognized as one of the important driving forces that affect the economic growth of developing countries [1]. FDI creates favorable conditions for developing countries to exploit capital from outside and acquire modern technology and business management experience of developed countries. Hence, FDI has improved life quality by creating jobs and increasing export turnover and economic growth. Further, FDI encourages domestic enterprises to improve their business capacity by improving new technologies, productivity, and by reducing product price due to foreign competition [2].

By definition, FDI is an activity wherein foreign investors come to a host country to establish and run their business enterprises. According to the International Monetary Fund (IMF), FDI is an investment established on the basis of long-term relationships where an organization in an economy (direct investor) gains long-term benefits from a business located in another economy. The purpose of a direct investor is to have considerable influence in managing the business located in the host economy. The Organization for Economic Co-operation and Development (OECD) defines an FDI enterprise as one having legal status or no legal status, in which a direct investor owns at least 10% of common

stocks or stocks with voting rights. The important characteristic of direct investment is the intention of controlling the enterprise. However, not all countries use the 10% level to determine FDI.

According to the transaction cost approach, FDI is the most effective alternative for foreign businesses to avoid facing high domestic transaction costs [3–5]. With the goal of maximizing profits and minimizing transaction costs, FDI contributes to increasing competitiveness, expanding the ability of the host country to export, collecting a portion of profits from foreign enterprises, and collecting foreign currency from FDI service activities. Another important benefit that FDI brings is modern technology, professional skills, and advanced management capacity. When investing in a country, the investor not only brings in capital in cash but also transfers in-kind capital such as machinery, materials, scientific knowledge, management know-how, and market access capabilities [6–13]. Hence, in the long run, these are the most fundamental benefits for the host country [1].

With the important role of FDI in the national economy, especially in the last few decades, researchers have paid great attention to investigating, using several approaches, the influence of FDI on the economy, society, and environment of the host countries. The transaction cost approach has been utilized in recent years to investigate the impact of FDI on the long-term sustainability at both at the national and provincial levels. Transaction cost theorists believe that, although FDIs are necessary, they are not really a requirement for countries and provinces. Their belief is grounded in the fact that, in addition to the positive impact of FDI, there are several negative impacts on the long-term sustainability of the host country or provinces. This is because FDI enterprises only focus on reducing their transaction costs in order to maximize their profits [14].

Sustainable development, according to the World Commission on Environment and Development [15], refers to development that meets the present needs without compromising the ability to meet the needs of future generations. The Asian Development Bank (ADB) defines sustainable development as a new type of development by integrating the production process with resource conservation and environmental quality improvement. Sustainable development must ensure effective economic development, a fair society, and a protected environment. Therefore, all socioeconomic members, authorities, and social organizations must be involved in achieving the purpose of reconciling three main areas, i.e., economic, societal, and environmental. Thus, it can be understood that sustainable development is a healthy development, in which the development of an individual and the community does not damage the interests of other individuals and communities. Further, the development of the present generation does not violate the benefits of future generations. Additionally, the development of humanity does not threaten survival or degrade the habitat of other species on the planet because human life is based on maintaining natural productivity, resilience, and diversity of the biosphere [16].

Concerning the relationship between FDI and the sustainability of the host country, in general, FDI allows countries and their provinces to take advantage of foreign capital and technology in order to realize the foremost goal of boosting economic development. Subsequently, other factors of the host countries (such as technology, production techniques, number of employed labors, labor productivity, income per capita, etc.) would be improved. In this sense, FDI positively influences the long-term sustainability of the host country and its province. FDI is an opportunity for countries and provinces to exploit their great potential for socioeconomic development.

However, FDI may have a negative impact on the sustainability of host countries and provinces [17]. Host countries and provinces face the risk of receiving obsolete technology because foreign enterprises often transfer their outdated technology and equipment for innovating their products and improving product quality in their own country. In addition, FDI is often carried out mainly by transnational enterprises. This has raised fears that these enterprises will increase the dependence of the host country, which receives ready-made capital, technology, and network of buyers and sellers. Further, unbalanced regional development, environmental harm, and many social issues are negative impacts of FDI in relation to the long-term sustainability of host countries. Therefore, along with creating an attractive investment environment, it is essential that the government and provincial authorities should focus on choosing partners and projects consistent with the long-term sustainable development of the country.

The governments of host countries can effectively do this by minimizing the negative impact caused by FDI investments and by implementing schemes to minimize transaction costs.

Given the rapid increase of FDI into developing countries in general and their provinces in particular, this study aimed to examine the impact of FDI on provincial sustainability in Vietnam. This emerging market has recorded the highest FDI growth in the Southeast Asian region in recent years [18]. Sustainable development has been the top priority on the agenda of the Vietnamese government for the past two decades [19,20]. The present study is among the first attempts that apply the transaction cost approach that facilitates the objective and accurate identification of the positive and negative impacts of FDI on the long-term sustainability at the provincial level in the host country. The findings of this study are expected to have implications on designing and possibly implementing effective FDI policies in Vietnam (i.e., host country) at both the national and provincial levels. These policies would then serve to address the positive influences of FDI on the long-term growth of the economy, society, and overall environment of this host country [10].

The remainder of this paper is structured as follows. We first provide a detailed discussion of the theoretical framework and hypotheses. Thereafter, we describe the research methodology including the variables, research field, and panel data. This is followed by a discussion of the research findings. Finally, we present key concluding remarks, practical implications, and future research directions.

2. Theoretical Framework and Hypotheses Development

2.1. Transaction Cost Approach with Respect to the Relationship between FDI and the Environment

According to the transaction cost approach, economic agents are considered to be rational utility maximizers [21–23]. The structure of the market system and its components increase inefficiency. This inefficiency is described as transaction cost. Basically, transaction costs are defined as the total costs of information, execution, and negotiation related to market transactions [24,25]. The existence of transaction costs can offer more efficient alternatives to market solutions.

Transaction costs incur when using the market system to buy and sell inputs and final products. They include the cost of identifying suppliers or customers, the costs of negotiating and signing contracts with them, the costs associated with imperfect market structures (for example, fees imposed by suppliers in the exclusive market), and other downsides such as unreliable supplies, restrictions on retail points, tariffs, and quotas. The exchange process normally incurs costs; hence, transaction costs act as a tax for transactions. The scope of these costs includes information search, negotiation, contracting and contract execution, achievement control, etc. [21,22,26]. These costs are not directly generated during the production process.

Transaction costs are important for investors as they are one of the main determinants of net profit. These costs reduce profits, and over time, high transaction costs might reduce the available capital to invest. Fees, such as mutual fund cost ratio, have the same effect. Different types of assets have different types of standard transaction costs. Hence, investors should choose assets with the lowest cost within the range of assets they want to choose. Transaction costs include time and cost of negotiating, drafting, and executing transactions or contracts [5,21,26]. These costs increase when the partner in the transaction acts opportunistically, meaning that personal gain is obtained at the expense of others. Therefore, transaction costs involve the consequences of opportunism, decision makers' weaknesses, and the cost of preventing opportunism.

In this research, we applied the transaction cost approach for analyzing the relationship between the enterprises' FDI decision and the sustainability of the host country. The sustainability of the host country influences the decision of enterprises in two ways: (i) Enterprises face high environmental compliance costs that increase their transaction costs, thereby choosing to move production through FDI, and (ii) enterprises possess an environmental competitive advantage when operating in a host country. In fact, enterprises' FDI decision to avoid facing the increase in transaction costs due to the high cost of environmental compliance in their country is called "industrial flight to pollution havens."

Foreign investors are not interested in environmental issues, especially in the host countries. The only issue they care about and make efforts to pursue is profit. This often leads to an adverse environmental impact and the lack of sustainable development of the host economy. However, FDI has a spillover effect on socioeconomic development through job creation, and investment in new environmentally friendly technologies (although still limited due to the product life cycle rules, and host countries receive old technology and outdated products), thereby improving people's lives and awareness. Thus, FDI promotes sustainable economic development relating to the environment.

At the macro level of a country, FDI influences sustainable development of the host country through certain mechanisms. In the transaction cost approach, the impact of FDI can be positive or negative, meaning that, in addition to its benefits, FDI can also bring about sustainable development costs of a country [27]. OECD [28] points out five mechanisms for positive impacts of FDI on sustainable development, which include (i) new technology transfer, (ii) human resource formation, (iii) integration into the global economy, (iv) increase in competition in host country, and (v) developing and restructuring businesses. However, the first four mechanisms can also negatively influence a country's sustainable development. In addition, FDI may cause difficulties in implementing sustainable development policies [17].

Transaction cost theorists argue that FDI has a significant impact on the host country's environment. Specifically, foreign-invested enterprises are seen as the main culprits of the activities relating to environmental destruction, especially in developing host countries. Often, these negative impacts are due to the market power of businesses and the ability to quickly deploy resources [29]. In addition, foreign investors often reduce their transaction costs by minimizing or eliminating costs of protection and recreating the host country's environment, which has a negative impact on the environment. This in turn affects the sustainable development of the host country.

However, according to the transaction cost approach, the positive impacts of FDI on the host country's environment are significant. FDI creates greater efficiency in the operation of the host country market. As environmental protection and resource conservation are closely related to efficiency, an FDI inflow contributes to improving environmental conditions in developing host countries [30]. Moreover, FDI enterprises are considered as a bridge between technology and important organizations between countries [31]. Based on the understanding of environment and technology, FDI enterprises often apply modern technology and organizational structure in the process of operation, thereby contributing to improving the host country's environment. In fact, through various diffuse and spillover effects [32], the environmental impacts of FDI at the national level are quite large, and sustainable development is thus enhanced.

At the provincial level, so far, there have not been many studies on the impacts of FDI on sustainable development. In addition, the issue of sustainable development often varies greatly among provinces with disparities in the level of socioeconomic development and urbanization such as the capital, the economic centers of a country, and remote highlands, border regions, islands, and areas that are home to ethnic minorities. According to the transaction cost approach, FDI has both positive and negative impacts on the environment (thereby affecting sustainable development) of a province [16].

Concerning its positive impacts, transaction cost theorists suggest that, in order to minimize transaction costs in the host country, FDI enterprises should contribute to provincial economic restructuring that would lead to long-term sustainability. FDI accelerates the process of economic restructuring of provinces by allowing deep integration into the world economy. In addition, FDI supplements capital for socioeconomic–environmental development of provinces, while domestic resources are limited. FDI creates favorable conditions for the host provinces to exploit a considerable amount of capital from outside because it does not stipulate the maximum capital contribution but only stipulates the minimum capital contribution for foreign investors [17].

In addition, FDI enterprises concentrate on implementing environmental investments in host provinces by meeting current regulatory standards and also by predicting the future environmental standards of host provinces. Thus, instead of focusing on polluting manufacturing exports and

practicing double standards, the transaction cost approach emphasizes how FDI can create positive environmental effects in host provinces [33].

According to the transaction cost approach, investment activities of FDI enterprises are associated with the process of scientific and technological transfer for minimizing their transaction costs. Thus, FDI creates opportunities for host provinces to receive modern technology and advanced business management experience of foreign partners. In particular, FDI creates favorable conditions for host provinces to effectively exploit their advantages of natural resources and geographical position. Moreover, FDI creates new jobs, accelerates economic growth (GDP), increases export turnover, and improves people's lives. Thus, FDI contributes to improving the social landscape, increasing productivity and income for the provincial economy by encouraging domestic business capacity and access to foreign markets. In general, FDI positively affects sustainable development of host provinces through all three aspects—economic, societal, and environmental [34].

Concerning its negative impacts, according to the transaction cost approach, as the investment areas and fields depend on the choice of foreign investors to minimize their transaction costs, the proactive arrangement of the investment structure of host provinces is limited. If these provinces have no strategic planning, it will lead to a negative impact. In addition, FDI often entails issues relating to culture and customs, which make it possible for host provinces to be affected negatively [14].

In addition, transaction cost theorists emphasize that, with FDI investors' aim of seeking solutions to reduce transaction costs for maximizing profits, without a specific investment plan, there may be widespread investment, inefficiencies, indiscriminate exploitation of natural resources, and serious environmental pollution. Moreover, FDI, if not associated with technology control of foreign partners, might make host provinces susceptible to becoming industrial dumps [16].

2.2. Hypotheses Development

2.2.1. FDI Inflows and Sustainability

FDI inflows involve indicators such as total FDI capital, total FDI projects, or number of active FDI enterprises in the economy. In particular, the total FDI and total FDI projects involve important sources of capital to the national economy by promoting the growth and economic restructuring toward industrialization and modernization [17]. In addition, according to the transaction cost approach, total FDI capital and total FDI projects are associated with transaction costs, bringing many benefits to the host country, thus significantly affecting its sustainable development.

Specifically, the higher the total FDI capital, the higher the domestic capital. Hence, the number of market transactions increase, thereby creating transaction costs in the host country, such as negotiation, information, environment, etc. Basically, FDI is a long-term development investment capital; therefore, for host countries, this is an essential long-term capital source in the economy by creating many benefits through transaction costs. The total FDI capital is associated with the construction of buildings, factories, and production branches. Therefore, the investment time is long, the amount of capital is stable, and the transaction cost is high in host countries [1].

The larger the number of active FDI enterprises in the economy, the higher the potential for sustainable development of that country. FDI enterprises always strive to minimize their transaction costs through a series of long-term solutions, thereby affecting sustainable development of host countries. This comes from the nature of FDI and the advantages of FDI enterprises as compared to other domestic enterprises. Specifically, FDI is a form of capital export to obtain high profits, and foreign investors decide on the FDI scale and use. As foreign investors always aim for profitability, they deploy a range of effective and long-term strategic solutions to develop their businesses. This has a pervasive impact on the sustainable development of the host country [34].

Specifically, FDI enterprises contribute to the development of national human resources by creating jobs for the majority of people as well as innovating the business knowledge of domestic managers. The laborers working with foreign enterprises are exposed to advanced technology, which has given

young people a dynamic outlook on the market mechanism, thereby giving domestic investors access to the world market [2].

Moreover, FDI owners are involved directly in the management and administration of the capital, with their obligations and benefits from the production and business activities corresponding to their capital contribution. Therefore, domestic enterprises have the opportunity to learn about and improve their management capacity. FDI enterprises effectively support the transfer of modern technology and professional techniques by developing domestic technology capabilities, creating linkage and spread among main industries and auxiliary ones [17].

FDI enterprises promote international competitiveness of domestic enterprises by motivating these enterprises to grow at a world level or generating large tax revenues for the government budget. Notably, FDI enterprises improve community health services, education, insurance and social security, infrastructure development, and intellectual standards. At the same time, to minimize legal transaction costs, business operations of FDI enterprises are transparent and always comply with the law. In addition, the technology transferred to host countries is often advanced and environmentally friendly. This makes it easier for host countries to control nontransparent foreign investment and cross-country money laundering, which can negatively affect the domestic economy [16].

With the above advantages, the greater the number of active FDI enterprises in the economy, the higher the potential for sustainable development of the host country. In general, the effective control of FDI inflows contributes to sustainable economic growth and improves the life quality in the long term by reducing conflicts between foreign investors and citizens as well as limiting serious environmental pollution [14]. Therefore, effective FDI inflows ensure sustainable development in terms of economy–society–environment [17].

However, a massive increase in FDI inflows negatively affects sustainable development by causing an imbalance in economic structures, increasing the gap between rich and poor regions, destabilizing the macroeconomy, producing serious environmental pollution, and many other consequences [34]. The cause of this situation can be explained by the transaction cost approach. Specifically, as foreign investors who want to maximize investment profits, foreign investors focus on implementing many solutions to reduce costs in order to increase their profits. One of these solutions is to minimize the transaction costs at the host countries through some negative activities such as fraud, tax evasion, etc., thus seriously influencing the sustainable development of host countries.

Therefore, under the transaction cost approach, it can be affirmed that FDI inflows have a strong impact on the sustainable development of a country in general and a province in particular. These impacts may be positive or negative. When a country or a province effectively attracts and uses FDI inflows, problems such as environmental pollution and economic instability due to the influence of FDI enterprises will no longer be a concern because the enterprises that are effectively built from FDI inflows always ensure that the waste treatment system satisfies the environmental standards of the host country [1].

Due to the strong impact of FDI inflows on sustainable development, at present, many countries in the world, especially developing countries, have had significant changes in the way of approaching FDI inflows. In recent years, it is easy to see that there is no longer a situation of attracting FDI inflows at all costs. At the same time, FDI inflows into countries are diversified and accompanied by strict requirements for sustainable economic development. This is the goal of many countries, including developed countries or developing ones today [16].

On the basis of above arguments, we propose the first hypothesis as follows:

Hypothesis 1 (H1): *FDI number and capital have a significant impact on provincial sustainability.*

2.2.2. Performance of FDI and Sustainability

To assess performance of FDI, countries use popular indicators such as the contribution of the FDI sector to GDP, net revenue, and profit of FDI enterprises [2]. In particular, the contribution of the

FDI sector to GDP is calculated by both value and proportion of total GDP. Under the transaction cost approach, the value and proportion of FDI contributions to GDP have a significant impact on the sustainable development of the host countries [16].

Specifically, FDI is associated with international integration and investment liberalization among countries in the region and the world. The host country has an FDI policy that clearly determines the responsibility of FDI enterprises operating in the economy on GDP contribution to the host country. Moreover, in order to maximize profits and minimize transaction costs, FDI investors decide to invest and take responsibility for their business results, so FDI often brings about high economic efficiency [14].

Therefore, in general, according to Pazienza [17], the FDI value and proportion in total GDP of host countries is quite high compared to those of other enterprise types in the economy. The major contribution of the FDI sector to the GDP of the host country contributes to GDP growth. In the short term, this contribution boosts domestic production and business activities by helping the national economy without surplus. At the same time, this contribution allows developing countries to be free of the pressure of inflation and exchange rate. According to transaction cost theorists, the positive contributions of FDI to sustainable development in the short term make it a better alternative as compared to international trade. Moreover, in the context of trade liberalization and economic globalization, countries tend to minimize FDI barriers by enhancing competition to attract FDI, thereby promoting FDI's contributions to the national GDP [16].

However, in the long term, the massive contributions of FDI to GDP demonstrate domestic enterprises' weak capacity of production and business. An economy based mainly on FDI, and not domestic enterprises, indicates low sustainability. In other words, the sustainable development of a country should be based on strong domestic enterprises, with competitive production and business capabilities with FDI and world enterprises [14].

Thus, if the value and proportional contribution of FDI to GDP are too large, it does not really demonstrate sustainable development of a country. In the long term, this situation makes the economy of the host country too dependent on foreign countries, leading to social and environmental consequences because FDI is often related to the culture, customs, and environment of host countries.

According to the transaction cost approach, the large value and proportion of net revenues and profits of FDI enterprises demonstrate that the business environment and other factors of the host country (such as policies, laws, infrastructures, labor market) create favorable conditions for the FDI sector to implement effective business plans and minimize transaction costs [16]. However, in the same business environment with almost the same external factors, the large value and proportion of net revenue and profit of FDI enterprises partly demonstrate the inefficiency of domestic enterprises, mainly from their weaknesses related to internal factors such as management capacity, financial capacity, and technology. These weaknesses increase their transaction costs by negatively influencing their business performance. In the long term, this situation does not ensure the sustainable development of the host country because it depends on foreign countries [2].

In general, similar to the value and proportion contribution of FDI to GDP mentioned previously, in the short term, the large value and proportion of net revenues and profits of FDI enterprises have a positive impact on the sustainable development of the host country. Large net revenue demonstrates the efficiency of providing goods and services. At the same time, large profits represent high contributions through taxes to the host country [34].

Thus, under the transaction cost approach, performance of FDI has a positive impact on sustainability, mainly in economic, societal, and environmental terms for the host country. However, in the long term, this situation involves the inefficiency of domestic enterprises in implementing business activities and competing with FDI enterprises. A country cannot develop sustainably without having strong domestic enterprises. Therefore, foreign direct investment has a significant impact on the sustainability of a particular country or province, depending on the level of FDI performance in that country [16].

Stemming from the above arguments, we propose the second hypothesis.

Hypothesis 2 (H2): *Performance of FDI has a significant impact on provincial sustainability.*

2.2.3. Employment in FDI Sector and Sustainability

The impact of FDI on human resources and employment is involved in the changes in size, structure, and quality of human resources and employment of the host country [34]. Currently, the impact of employment in the FDI sector is assessed by countries through indicators such as FDI's contribution to employment (the number and proportion of FDI employees in the overall) and income per capita/month/year of FDI enterprises (value and proportion).

According to the transaction cost theorists, employment in the FDI sector has a significant and positive impact on the sustainability of the host country. To avoid facing high transaction costs, FDI enterprises make the most of the cheap source of labor in host countries, especially in developing countries. Therefore, at present, FDI enterprises possess a strong labor force. This creates jobs by reducing considerable unemployment and creates high economic value for the country receiving the investment. Specifically, FDI enterprises create jobs for many employees (the number of employees in the FDI sector is large), thereby improving people's lives and their understanding of environmental protection. Subsequently, the employment contributions of the FDI sector have created a spillover effect on the sustainability of the host country [17].

Moreover, to minimize transaction costs, FDI investors mainly focus on the industries in line with modern developmental trends in the world such as manufacturing, processing, construction, and service. These are the sectors that need to be developed in developing countries. Further, as most countries receiving FDI are developing countries, the majority of their labor force in FDI enterprises come from rural areas with no training in industrial knowledge and skills. Thus, FDI enterprises contribute to labor restructuring, which is consistent with the general trend of the world by contributing significantly to sustainability of host countries [2].

In addition, through the employment supply, FDI enterprises bring a stable source of income for their employees, thereby improving community life and limiting social evils. Thus, employment in the FDI sector has a significant impact on the sustainability of host countries. The higher the average income per capita/month/year of FDI enterprises (value and proportion), the greater the impact on sustainable development [34].

In addition, indicators such as quality of human resources and employment quality can be used to assess the impact of employment in FDI on the sustainability of a country or its provinces. However, it is difficult to evaluate these criteria [17]. In general, in the process of working for FDI enterprises, employees have improved in many aspects such as industrial style, corporate culture, skills, technical expertise, work management ability, and foreign language proficiency. Many employees, after working in FDI enterprises, have become good technicians and managers in enterprises. Thus, employment in the FDI sector strongly influences the sustainability of countries, especially in developing countries [14].

However, in an objective way, transaction cost theorists believe that there are some negative impacts of FDI on the employment, thus adversely affecting sustainable development of host countries [2]. Specifically, because foreign investors' major motive for deciding to invest is to minimize the transaction costs at the host country, when the transaction cost at the host country is high, they will consider investing in another country with lower transaction costs. This leads to the low employment stability of FDI enterprises. In FDI enterprises, employees are easily fired or lose their jobs when the enterprises close. Older FDI employees might face unemployment for many different reasons, including the influence of industrial revolution and poor organization management. As a result, labor disputes surface, which include strikes and go-slow movements in FDI enterprises [16].

In particular, host country employees' slow adaptation to modern industrial production of FDI enterprises causes many difficulties and challenges. Some challenges that the employees in FDI

enterprises often encounter are modern production, strict management, weak health, high labor intensity, strict labor technology, and cultural and language differences [34].

As a result, many employees in host countries only work in FDI enterprises for a certain number of years and are always looking for other jobs that better fit their needs and conditions. Thus, according to the transaction cost approach, in the long term, employment in FDI sector may negatively affect the sustainability of a country or its provinces [2].

Based on the above arguments, we develop the third hypothesis as follows:

Hypothesis 3 (H3): *Employment in FDI sector has a significant impact on provincial sustainability.*

3. Methodology

3.1. Variable Measurement

3.1.1. Dependent Variable

We used the adjusted net savings (ANS) of the World Bank [35] to assess the sustainable development of Vietnam provinces. ANS measures the real savings rate in the economy after taking into account investments in human capital, depletion of natural resources, and pollution losses. ANS, also called genuine saving, is an indicator to assess the sustainability of the economy. Positive savings allow wealth to increase over time, thus ensuring that future generations enjoy at least as many opportunities as the current generation. In this sense, ANS seeks to provide policy makers with a track of their progress in provincial sustainability efforts.

ANS originates from standard accounting measures of total savings by performing four specific adjustments as follows:

- (i) Fixed capital consumption is deducted to get net provincial saving;
- (ii) Current public spending on education is added to investment accounts in human resources;
- (iii) Estimation of depletion of many natural resource types is deducted to reflect the decline in asset value relating to mining and depletion;
- (iv) Deductions are made for damages from carbon dioxide and particle emissions.

The formula for ANS is as follows:

$$\text{ANS} = \text{Gross provincial saving} - \text{Consumption of fixed capital} + \text{Education Expenditure} - \text{Energy depletion} - \text{Mineral depletion} - \text{Net forest depletion} - \text{Damage from carbon dioxide emissions} - \text{Damage from particulate emissions}.$$
 This indicator has increasingly been used by scholars to assess the sustainable development [36–39]. In our research, this variable was calculated according to the foregoing formula from the data collected in the statistical yearbook of Vietnam provinces during the 2010–2016 period.

3.1.2. Independent Variables

The independent variables used in this research are distinguished in three groups, associated with (i) the FDI inflow stocks, (ii) employment in the FDI sector, and (iii) the performance of FDI in provinces.

Independent Variables Measuring the FDI Inflow Stocks

To test hypothesis 1, we used the following three independent variables for measuring the FDI inflow stocks of a province:

The proportion of the number of active FDI enterprises to the number of total active enterprises in a province (FDIENT) is calculated by dividing the number of active FDI enterprises by the number of total active enterprises in the province. This indicator shows the proportion of active FDI enterprises in the total number of enterprises operating in the province. The larger the number of active FDI enterprises in the province, the higher the potential for the sustainability of that province. According

to the transaction cost approach, to maximize profits, FDI enterprises always try to minimize their transaction costs through a series of long-term economic, social, and environmental solutions, thereby affecting sustainable development of the host province. The formula for calculating this indicator is as follows:

$$FDIENT = \frac{\text{Number of active FDI enterprises}}{\text{Number of total active enterprises in province}}. \quad (1)$$

The proportion of capital of active FDI enterprises to the capital of total active enterprises in provinces (FDICAP) is calculated by dividing the capital of active FDI enterprises by the capital of total active enterprises in province. This indicator shows the scale of FDI enterprises in the province. The larger the amount of capital of active FDI enterprises, the greater the number of market transactions in the province. FDI capital is a long-term development investment, so this is an important long-term supplementary capital in the provincial economy creating many benefits for provincial sustainability. This indicator is commonly used to assess the impact of FDI inflows and is calculated according to the following formula:

$$FDICAP = \frac{\text{Capital of active FDI enterprises}}{\text{Capital of total active enterprises in province}}. \quad (2)$$

The proportion of fixed asset and long-term investment of active FDI enterprises to this value of total active enterprises in a province (FDIAST) is calculated by dividing value of fixed asset and long-term investment of active FDI enterprises by the value of total active enterprises in provinces. This indicator indicates the level of FDI investment in the provincial economy. This high indicator shows that the investment level of FDI inflows in province is high, thereby significantly affecting provincial sustainability. This indicator is calculated as follows:

$$FDIAST = \frac{\text{Value of fixed asset and long – term investment of active FDI enterprises}}{\text{This value of total active enterprises in province}}. \quad (3)$$

Independent Variables Measuring the Performance of FDI

To test the second hypothesis, we used the following five independent variables for measuring the performance of FDI in a province:

The proportion of net turnover of active FDI enterprises to this value of total active enterprises in a province (FDITUR) is calculated by dividing net turnover of active FDI enterprises by net turnover of total active enterprises in a province. This indicator implies the net turnover proportion of active FDI enterprises in a province. The higher the indicator, the greater the performance and contribution of FDI enterprises to provincial sustainability. The formula for calculating this indicator is as follows:

$$FDITUR = \frac{\text{Net turnover of active FDI enterprises}}{\text{Net turnover of total active enterprises in province}}. \quad (4)$$

The proportion of GDP generated by the FDI sector to the total GDP of a province (FDIGDP) is calculated by dividing GDP generated by the FDI sector by Total GDP of a province. GDP is an indicator of the development of a nation or a province. Hence, this indicator shows the performance of active FDI enterprises in a province. This high indicator implies the great contribution of the FDI sector to provincial sustainability. This indicator is calculated under the following formula:

$$FDIGDP = \frac{\text{GDP generated by FDI sector}}{\text{Total GDP of province}}. \quad (5)$$

The return on value of fixed asset and long-term investment of FDI (FDIOROFA) is calculated by dividing the earnings before interest and taxes (EBIT) of all active FDI enterprises in the province by their total fixed asset and long-term investment. This indicator indicates how many earnings

fixed assets and long-term investment generates before tax and interest of active FDI enterprises in a province. The higher the indicator, the more effective the active FDI enterprises in a province by contributing significantly to provincial sustainability. The formula for calculating this indicator is as follows:

$$\text{FDIOROFA} = \frac{\text{Earnings before interest and taxes of active FDI enterprises in province}}{\text{Value of fixed asset and long term investment of active FDI enterprises in province}}. \quad (6)$$

The return on total capital of FDI (FDIOTC) is calculated by dividing earnings before interest and taxes of active FDI enterprises in province by total capital of active FDI enterprises in a province. This indicator reflects how many earnings before interest and taxes are generated by FDI enterprises in a province when using capital. The higher the indicator, the more effective the FDI enterprises in the province. Thus, FDI enterprises contribute significantly to provincial sustainability. The formula for calculating this indicator is as follows:

$$\text{FDIOTC} = \frac{\text{Earnings before interest and taxes of active FDI enterprises in province}}{\text{Total capital of active FDI enterprises in province}}. \quad (7)$$

The return on sales of FDI (FDIROS) is widely used to assess the performance of an entity. This indicator shows how many earnings before interest and taxes after paying for different production costs such as wages, raw materials, etc. are generated by FDI enterprises in a province. In other words, it indicates the amount of earnings before interest and taxes in FDI enterprises' turnover. In business, operating profit margin, also known as operating income rate, operating profit rate, or profit rate of EBIT and revenue (ROS), is usually expressed as a percentage. The higher this indicator, the higher the performance of active FDI enterprises in the province. This means these enterprises make a lot of contributions to sustainability of the province.

$$\text{FDIROS} = \frac{\text{Earnings before interest and taxes of active FDI enterprises in province}}{\text{Net turnover of active FDI enterprises in province}}. \quad (8)$$

Independent Variables Measuring the Employment in FDI Sector

To test the third hypothesis, we used the following three independent variables for measuring employment in the FDI sectors of a province:

The proportion of the number of employees in FDI enterprises to the number of employees in total enterprises in a province (FDIEMP) is calculated by dividing the number of employees in FDI enterprises by the number of employees in total enterprises in the province. The higher this indicator, the more FDI jobs are created in the province, thereby improving people's lives and the understanding of environmental protection. Hence, employment in the FDI sector has a significant impact on the sustainable development of a province. The formula for calculating this indicator is as follows:

$$\text{FDIEMP} = \frac{\text{Number of employees in FDI enterprises}}{\text{Number of employees in total enterprises in province}}. \quad (9)$$

The proportion of compensation of FDI employees to the total compensation of total employees in province (FDICOM) assesses the impact of FDI on the sustainability of a province through the compensation of FDI employees. This indicator is calculated by dividing the compensation of FDI employees by the compensation of total employees in the province. Basically, the higher this indicator, the greater the benefits of employees in FDI enterprises. Therefore, these enterprises contribute significantly to provincial sustainability. This indicator is calculated according to the following formula:

$$\text{FDICOM} = \frac{\text{Compensation of FDI employees}}{\text{Compensation of total employees in province}}. \quad (10)$$

The difference between the monthly average compensation of an employee working in an FDI enterprise and the average one (of all kinds of employees) in a province (FDIWAG) measures the employment in FDI sectors in detail by dividing monthly average employee compensation in an FDI enterprise by the monthly average one (of all kinds of employees) in the province. The higher this indicator, the higher the income of FDI employees, thereby affecting provincial sustainability by improving community life and limiting social evils in the province.

$$\text{FDIWAG} = \frac{\text{Monthly average employee compensation in FDI enterprise}}{\text{Monthly average one (of all kinds of employees) in province}}. \quad (11)$$

3.1.3. Control Variables

In this research, we used the (i) size and (ii) economic growth of a province as control variables. These two variables imply characteristics of each province, thus explaining the variation of the dependent variable. The province size is measured by the logarithm value of gross domestic product (GDP), and economic growth is the index of GDP growth of a province at constant 2010 prices. These two variables are commonly used as control variables to study the impact of FDI on national or provincial sustainability.

$$\text{Size}_{ij} = \log(\text{GDP}_{ij} \text{ at current price})$$

$$\text{GDPgrowth} = \frac{\text{Earnings before interest and taxes of active FDI enterprises in province}}{\text{Net turnover of active FDI enterprises in province}}.$$

3.2. Research Field and Method

3.2.1. Research Field of FDI in Vietnam

In recent years, FDI has poured vigorously into Vietnam (as well as its provinces) after many efforts to improve the investment environment of the Government of Vietnam, as well as the participation in many new generation free trade agreements, including Vietnam–Korea FTA and Vietnam–EU FTA. According to the Ministry of Planning and Investment of Vietnam [40], FDI over the years has tended to increase, but there was a strong fluctuation in the period 2010–2016 (Table 1). The decrease in FDI inflows was due to the global economic recession, the inflation, the rising input costs, and the difficulties in project clearance. However, since 2013, the number of FDI projects and total registered capital has tended to improve. Up to 2016, the FDI inflow stock in Vietnam, measured by the total registered capital accumulated of active projects, had reached 293.7 billion USD, accounting for about 23.7% of the total social investment capital and contributing 20% to Vietnam's GDP [40].

The data of 63 provinces in Vietnam were collected from the statistical yearbooks of Vietnam's provinces during the period from 2010 to 2016 [41]. Provincial statistical yearbooks are compiled and published annually by the Provincial Statistical Office. The contents include basic statistics to indicate the actual situation of the socioeconomic situation of the provinces. This is the official data source by providing accurate information on the situation of FDI in Vietnam provinces over the years. After importing data into Excel, we processed the data using simple statistical methods. We excluded the Dien Bien province because there was no FDI invested in this province. Therefore, there were 434 year-observations of 62 provinces. Each province has seven-year observations.

Table 1. Foreign direct investment (FDI) inflows in Vietnam in the period of 2010–2016.

Year	Number of Projects	Total Registered Capital (Mill. USD)	Number Accumulated of Active Projects	Total Registered Capital Accumulated of Active Projects (Mill. USD)
2010	1237	19,887	12,463	194,572
2011	1186	15,598	13,440	199,079
2012	1287	16,348	14,522	210,522
2013	1530	22,352	15,932	234,121
2014	1843	21,922	17,768	252,716
2015	2120	24,115	20,069	281,883
2016	2613	26,891	22,594	293,700

(Source: MPI, 2010–2016).

Up to 2016, foreign investors had invested in 63 provinces and cities of Vietnam, of which Ho Chi Minh City is the locality that attracts the most foreign investment, with a total active accumulated registered capital of 45.3 billion USD, accounting for 15.42% of national FDI stock. Ba Ria-Vung Tau and Binh Duong are ranked second and third with a total active accumulated registered capital of 27.1 billion USD (9.22%) and 26.6 billion USD (9.06%), respectively. The national capital, Hanoi, is only ranked fifth because it faces competition from Hai Phong and Bac Ninh—both these provinces have had rapid growth in attracting FDI in recent years. After synthesizing and processing the data collected, we obtained the research sample described in Table 2.

Table 2. Top 10 FDI provinces in Vietnam in 2016.

Province	GDP Growth (%)	Active FDI Registered Accumulated (Mill. USD)	Active FDI Projects Accumulated (Unit)	Contribution of FDI Sector to GDP (%)	Number of Employees in FDI Enterprises (Person)
Ho Chi Minh City (Southern Region)	8.05	45,293	6,762	23.80	667,455
Ba Ria-Vung Tau (Southern Region)	0.32	27,089	345	40.95	64,484
Binh Duong (Southern Region)	8.56	26,600	3050	45.38	655,899
Dong Nai (Southern Region)	7.77	25,872	1368	43.87	539,264
Hanoi Capital (Northern Region)	8.20	25,749	3960	15.07	270,858
Hai Phong (Northern Region)	13.47	14,465	561	22.01	142,092
Bac Ninh (Northern Region)	19.19	12,573	936	62.96	212,875
Ha Tinh (Central Region)	−15.31	11,593	64	10.39	7603
Thanh Hoa (Central Region)	9.05	10,643	87	8.51	101,100
Hai Duong (Northern Region)	8.40	7449	383	24.77	159,987

(Source: MPI [40]).

In 2016, the Bac Ninh province obtained the highest GDP growth rate among the top 10 FDI provinces in Vietnam (reaching 19.19%). Meanwhile, Ha Tinh achieved a negative GDP growth rate,

reaching -15.31% . Ho Chi Minh City had the highest active FDI registered accumulated among the 10 provinces (45,293 m USD). With 6762 units, Ho Chi Minh City is the leading province of active FDI projects accumulated. Next is Hanoi with 3960 units.

With a rapid GDP growth rate in 2016, Bac Ninh had the highest GDP contribution among the top ten FDI provinces in Vietnam (62.96%). In addition, Binh Duong, Dong Nai, and Ba Ria-Tau are provinces with strong FDI enterprises, contributing significantly to the GDP of these provinces—45.38%, 43.87%, and 40.95%, respectively. In spite of having the highest active FDI registered accumulated among the 10 provinces, the FDI sector contributed only 23.80% to Ho Chi Minh City's GDP in 2016. Concerning the number of employees, Ho Chi Minh City and Ba Ria-Vung Tau had the highest number of employees working in FDI enterprises—667,455 and 655,899 employees, respectively.

3.2.2. Variable Description

The variable statistics are described in detail in Table 3.

Table 3. Variable statistics.

Variable	Unit	Observation	Mean	Std. Dev.	Min	Max
Dependent Variable						
ANS	%	434	15.424	2.931	9.065	29.441
Independent Variables of FDI Inflow Stocks in Provinces						
FDIENT	%	434	1.985	2.680	0.037	18.104
FDICAP	%	434	15.251	16.956	0.023	74.131
FDIAST	%	434	17.607	18.976	0.001	85.431
Independent Variables of FDI Performance in Provinces						
FDITUR	%	434	14.839	18.387	0.000	87.117
FDIGDP	%	434	8.890	12.854	-0.006	72.148
FDIOTC	%	434	2.929	10.406	-58.427	62.729
FDIROFA	%	434	6.227	26.856	-204.295	150.000
FDIROS	%	433	-0.688	25.085	-225.968	65.744
Independent Variables of Employment of FDI Sector in Provinces						
FDIEMP	%	434	18.171	19.094	0.010	70.489
FDICOM	%	434	18.990	20.017	0.000	72.859
FDIWAG	%	434	1.067	0.390	0.000	3.209
Control Variables of Characteristics of Provinces						
GDP Growth	%	434	8.692	5.086	-15.310	53.200
GDP	Bil. VND	434	63,270	106,838	3504	1,023,926
Size	Unit	434	4.573	0.392	3.545	6.010

Abbreviations defined on pages 9–12.

With a total of 434 observations, the dependent variable of ANS achieved a mean value of 15.424%, of which the maximum value was 29.441% and the minimum value was 9.065%, while the standard deviation was 2.931. For the independent variables of FDI inflow stocks in provinces, FDIASST had the highest mean value (17.607%) with a maximum value of 85.431% (a standard deviation of 18.976). For the independent variables of FDI performance in provinces, FDITUR had the highest mean value of 14.839% (the standard deviation is 18.387), while FDIROS had the lowest mean value, reaching -0.688% with a standard deviation of 25.085. For the independent variables of employment of the

FDI sector in provinces, FDICROM had the highest mean value (reaching 18.990%) with a maximum value of 72.859%. For the control variables relating to the characteristics of provinces, the mean value of GDP growth was 8.692% (with a maximum value of 53.200% and a minimum value of −15.310%). Concerning size of provinces, the mean value of this variable was 4.573 units, and the standard deviation was 0.392.

3.2.3. Research Method

In this research, regression models used panel data and were regressed in three ways, namely (i) pooled Ordinary Least Squares (OLS) model, (ii) random effects model, and (iii) fixed effects model. Next, the Lagrange multiplier (LM) was used to decide if the random effect model or the pool OLS model was suitable for our present research [42].

Further, the fixed effects model and the random effects model were compared using the Hausman test, also known as the Durbin–Wu–Hausman (DWH) test [43]. This process of selecting the regression model for panel data was determined by Dougherty [44] and Torres-Reyna [45].

Specifically, the process of choice of regression model for panel data begins with considering whether the observations are a random sample from a given population. If these observations were a random sample, we performed both fixed effects and random effects, otherwise we used fixed effects.

Next, we determined whether there were significant differences in the coefficients through the DWH test. Hence, we used fixed effects, or we provisionally chose random effects. Next, it was necessary to test the presence of random effects. In having random effects, random effects was used; otherwise, pooled OLS was used. The process of the choice of regression model is depicted in Figure 1.

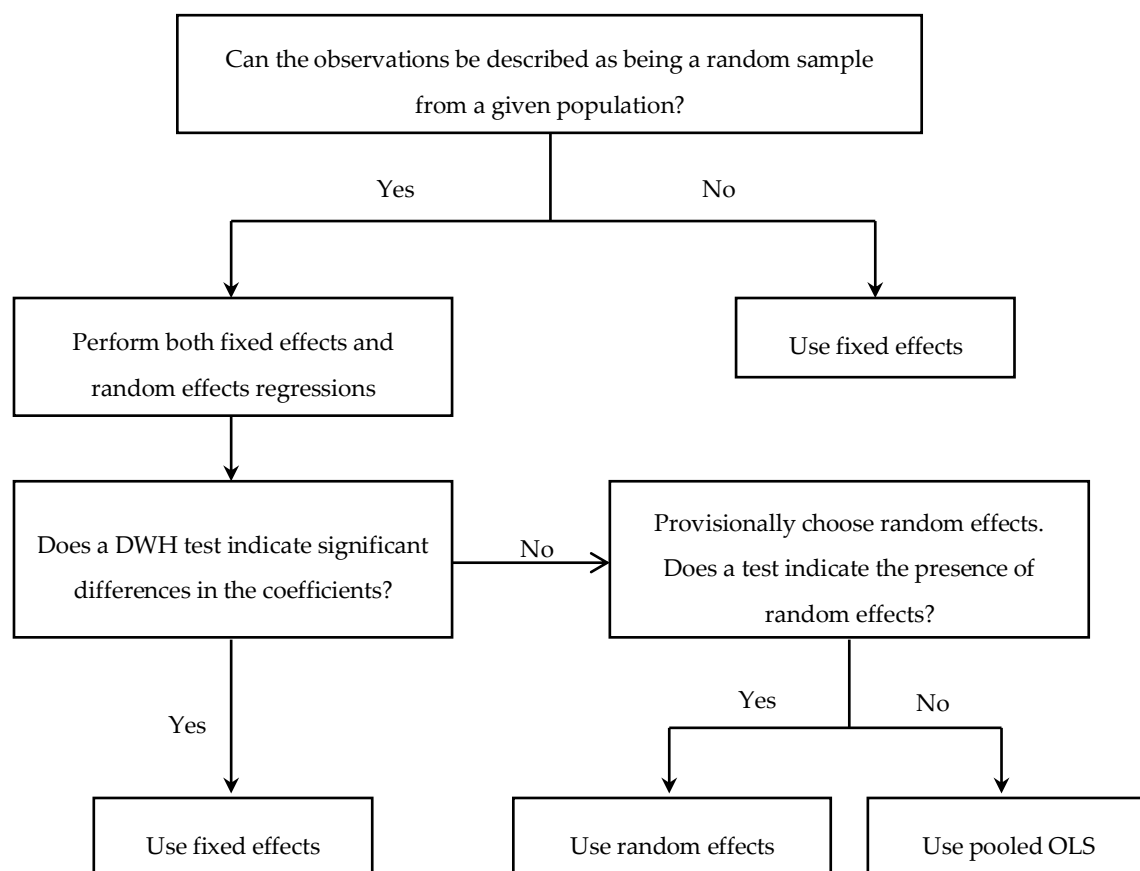


Figure 1. Process of choice of regression model for panel data. Note: DWH: Durbin–Wu–Hausman; OLS: Ordinary Least Squares. Source: Dougherty [44] pp. 421.

The proposed regression models are as follows:

The equation for pooled OLS regression is:

$$Y = \alpha + \beta_i X_i + \varepsilon, \quad (12)$$

where:

α is the intercept;

Y is the dependent variable of ANS;

X_i represents the i th independent and control variables;

β_i is the coefficient for respective independent and control variables; and

ε is the error term.

The equation for the fixed effects model is:

$$Y_{it} = \alpha_i + \beta_i X_{it} + \varepsilon_{it}, \quad (13)$$

where i = province and t = year from 2010 to 2016; and:

α_i ($i=1 \dots n$) is the unknown intercept for each entity (n entity-specific intercepts);

Y_{it} is the dependent variable of ANS;

X_{it} represents the independent and control variables;

β_i is the coefficient for respective independent and control variables; and

ε_{it} is the error term.

The equation for the random effects model is:

$$Y_{it} = \alpha + \beta_i X_{it} + u_{it} + \varepsilon_{it}, \quad (14)$$

where i = province and t = year from 2010 to 2016; and:

α is the intercept;

Y_{it} is the dependent variable of ANS;

X_{it} represents the independent and control variables;

β_i is the coefficient for respective independent and control variables;

u_{it} is the individual impact of province i^{th} , is not measurable variables; and

ε_{it} is the error.

4. Research Findings

The regression results are presented in Table 4. Accordingly, for checking the Pooled OLS, we examined the Breusch–Pagan Lagrange multiplier (LM) that is also significant by refusing the pooled OLS. Then, the significant Hausman's test allowed us to accept the null hypothesis by indicating that the fixed effects model is appropriate [46]. In the next step, we checked the Heteroskedasticity test for the selected fixed effects model. This significant test indicates that our fixed effects model has a heteroskedasticity problem; hence, we used the robust option to correct this regression model. Finally, the robust fixed effects model was used to assess the proposed research hypotheses.

Table 4. Regression results.

Dependent Variable: ANS (Adjusted Net Savings)								
Independent Variables	Pooled OLS		Fixed Effects Model		Random Effects Model		Robust Fixed Effects Model	
	Coef.	T	Coef.	t	Coef.	z	Coef.	t
FDIENT	0.340 ***	4.23	−0.003	−0.03	0.354 **	3.16	−0.003	−0.03
FDICAP	0.011	0.29	0.084 **	3.42	0.056	1.64	0.084 **	3.48
FDIAST	−0.023	−0.75	−0.069 ***	−3.53	−0.049 †	−1.79	−0.069 **	−3.33
FDIEMP	−0.011	−0.34	0.093 ***	4.14	0.009	0.32	0.093 **	3.50
FDICOM	−0.016	−0.45	−0.008	−0.47	−0.008	−0.31	−0.008	−0.53
FDIWAG	−0.585	−1.57	0.343	1.37	−0.253	−0.72	0.343	0.96
FDITUR	−0.016	−0.75	−0.018	−1.31	−0.025	−1.27	−0.018	−1.53
FDIGDP	0.063 **	2.49	0.029 †	1.80	0.076 **	3.44	0.029	1.20
FDIROTC	−0.081	−3.88	−0.005	−0.39	−0.014	−0.80	−0.005	−0.23
FDIROFA	0.012 **	1.66	0.001	0.27	0.003	0.56	0.001	0.26
FDIROS	−0.002 **	−0.33	−0.008 *	−2.06	−0.006	−1.16	−0.008	−1.13
Size	−2.903 ***	−6.55	−19.608 ***	−35.03	−12.141 ***	−18.95	−19.608 ***	−16.78
GDP Growth	0.027	1.00	0.032 **	2.42	0.057 **	2.93	0.032	1.49
_cons	29.002 ***	14.31	102.869 ***	42.47	69.715 ***	24.78	102.869 ***	20.04
N	62		62		62		62	
Observation	434		434		434		434	
R ²	0.2048		0.100 (overall)		0.128 (overall)		0.1000 (overall)	
F-statistics/Wald χ^2			129.42 ***		525.11 ***		58.04 ***	
F-test	8.32 ***		35.82 ***					
Correlation (corr(u_i, Xb) or VIF)	High VIF > 10		−0.9201		0.000 (assumed)		−0.9201	
Hausman’s Test	237.83 ***							
LM-test	132.72 ***							
Heteroskedasticity Test	17371.99 ***							

† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Hypothesis 1 is partially supported. It is confirmed first by the independent variable of FDICAP that significantly and positively influences the sustainability of a province at the confidence level of 95% (Coef. = 0.084; $t = 3.48$; $p = 0.001$). This means that the greater the capital of FDI enterprise compares to the total capital of active enterprises in a province, the higher the sustainability of a province. In fact, FDI is considered as one of the important capital sources to offset the shortage of investment capital by contributing to creating a driving force for the growth and development of a country in general and a province in particular. Relatively, our findings echo previous studies' findings that indicated that an FDI has a positive impact on the environment [34] and CO₂ emission [17], in contrast with some other studies that found a negative impact [2,16].

In fact, the reception of a large amount of foreign capital influences both total demand and total supply of the national/provincial economy. For total demand, as investment is a large part, while abnormal investment changes can have a great impact on output and income in the short term. For total supply, investment performance increases total supply (especially long-term supply), leading to increase in potential output, so product price decreases. Increased output and reduced prices allow increasing consumption, thereby stimulating production. Production development contributes to promoting socioeconomic development by increasing income for workers and improving the lives of people of the host country or host province.

Attracting foreign capital investment of provinces in particular and countries in general affects economic growth rate. Specifically, this activity promotes investment scale and technical innovation in the context of the rapid development of science technology and production forces in the world. Thus, host countries in general and provinces in particular take full advantage of comparative advantages to strengthen their internal resources.

According to the transaction cost approach, to reduce transaction costs, FDI enterprises focus on investing in high-tech industries, environmentally friendly technologies, clean energy, renewable energy, manufacturing medical equipment, health care services, education and training, etc. Therefore, attracting foreign investment capital allows provinces to undergo economic restructuring. In particular, this activity contributes to solving the development imbalances among regions in a province. Further, the industry structure, technology structure, product and labor structure, and territorial structure of provinces will be changed to better meet the socioeconomic development needs of the country.

Moreover, to minimize transaction costs, foreign investors attach importance to the application of advanced science and technology. Therefore, attracting foreign capital investment of provinces enhances their science and technology capacity. Through foreign direct investment, enterprises (mainly multinational ones) have transferred technology from their own countries or from other countries to host countries in general and host provinces in particular. Although there are many limitations due to objective and subjective factors, it is undeniable that, thanks to this transfer, provinces receive advanced techniques (including technologies that cannot be bought by trade relations) together with management experience and a trained workforce (technical qualifications, working methods, labor disciplines).

Second, the regression results show also a significant but negative impact of the variable FDI_{AST} on the sustainability of a province at the confidence level of 95% (Coef. = -0.069 ; $t = -3.33$; $p = 0.001$). It means that the bigger the FDI projects with the value of fixed asset and long-term investment, the lower the provincial sustainability. Basically, big FDI projects often invest in fields such as natural mining, chemicals, industrial processing, etc. These projects negatively affect the provincial environment in particular and the host country in general.

Specifically, many FDI enterprises devastate the natural environment by over-exploiting natural resources (especially nonrenewable resources such as minerals). Thus, the greater the value of fixed assets and long-term investment, the higher the level of exploitation and destruction of natural resources in the province, which negatively affects provincial sustainability in the long term.

In addition, to minimize transaction costs, FDI manufacturing projects in provinces are one of the most important causes of environmental pollution because many FDI enterprises violate environmental

protection and do not take measures to handle environmental pollution caused by waste generated in the production process. Thus, provinces face the conflict between industrial production growth, maintaining high economic growth rate with environmental pollution caused by production.

In general, big FDI projects with a high value of fixed asset and long-term investment are mainly implemented in the field of industrial production. Therefore, industrial waste that is not properly handled and strictly controlled will negatively influence provincial sustainability by causing environmental pollution and big social costs.

Moreover, the attention of FDI enterprises on long-term investment reduces the investment opportunities of domestic enterprises in the province. Under the cost transaction approach, FDI enterprises tend to pay more attention to long-term investment in the province in order to minimize their transaction costs. In the long-term, this situation affects the development and investment performance of domestic enterprises. Meanwhile, domestic enterprises are an important pillar of provincial economic development. Thus, FDI projects with the great value of fixed asset and long-term investment have a significant and negative impact on provincial sustainability.

The variable of *FDIENT* does not have a significant impact on the sustainability of a province. In fact, in host provinces, small and medium projects have low capital and value of fixed asset and long-term investment, while the projects that cause environmental pollution often have important capital and value of fixed asset and long-term investment. Currently, the number of small and medium FDI projects is very large, investing in many different industries, which account for a large proportion of trade, service, and tourism. The majority of them contribute positively to province sustainability.

Meanwhile, FDI projects harming province sustainability are often big ones in natural mining, chemicals, or industrial processing. It is interesting to note that some of these which are not well controlled have a serious impact on provincial sustainability. Currently, the number of FDI projects in these fields is not high. Therefore, the proportion of active FDI enterprises in each province does not have a significant impact on the sustainability of the province.

In general, (i) total FDI capital and (ii) the value of fixed assets and long-term investments of active FDI enterprises in a province are two indicators that have a significant impact on provincial sustainability. Therefore, the host provinces in particular and host countries in general should prioritize the quality of FDI projects in terms of capital, not the number of FDI projects. In particular, host provinces should focus on well controlling FDI projects with important value of fixed asset and long-term investment for ensuring provincial sustainable development.

Hypothesis 2 is not supported. There are no independent variables associated with the performance of FDI which have a significant impact on province sustainability. Our regression results show that the variable of *FDITUR* has no impact on the sustainability of a province at a confidence level of 95% (Coef. = -0.018 ; $t = -1.53$). Further, the variable of *FDIGDP* also has no significant impact on the sustainability of a province at a confidence level of 95% (Coef. = 0.029 ; $t = 1.20$). Thus, FDI projects that generate a lot of revenue or significantly contribute to the GDP of a province have no significant impact on provincial sustainability. These should support the pollution haven and both the halo and scale effects suggested by Pao and Tsai [2].

According to the regression results, the variable of *FDIOROFA* does not have a significant impact on the sustainability of a province at a confidence level of 95% (Coef. = 0.001 ; $t = 0.26$). With a confidence level of 95% (Coef. = -0.005 ; $t = -0.23$), the variable of *FDIOTC* has no impact on the sustainability of a province. Similarly, the regression results indicate that the variable of *FDIROS* has no impact on the sustainability of a province at a confidence level of 95% (Coef. = -0.008 ; $t = -1.13$). Thus, the performance of FDI projects has no significant impact on the sustainability of a province. This result is explained by the transaction costs approach—specifically, with the aim of avoiding facing high domestic transaction costs, foreign investors choose FDI to minimize their transaction costs by occupying market share, enjoying tax incentives, exploiting natural resources, using cheap labor, and transferring old technologies.

Therefore, profit is the top target of FDI enterprises operating in provinces. FDI enterprises concentrate on pursuing revenues and profits but ignoring the host countries and provinces' social and environmental responsibilities by minimizing these costs, even evading social and environmental obligations in provinces. Thus, the performance of FDI projects does not significantly affect the sustainability of province.

Note 1: Positive Impact of FDI on the Sustainability of Vietnam Provinces.

FDI projects in Vietnam provinces have contributed to stable development in all aspects of politics, security, economy, and society. Specifically, the FDI projects have promoted GDP growth by meeting the capital source for the national economy in general and provincial one in particular. Through the implementation of FDI projects, new and modern technologies have been transferred to Vietnam and its provinces to improve labor productivity and competitiveness in the market. Further, the total export turnover has increased significantly. The FDI projects solve the employment problems of the provinces. The host countries have the opportunity to participate in the global network to boost their export activities. Moreover, FDI projects contribute to the budget by making an important contribution to increasing the surplus of capital accounts and improving the balance of payments. For example, some FDI projects have positive impacts on Vietnam provinces' sustainability, such as:

(1) The project of manufacturing tires of Kumho Asiana Group (Korea) had a total investment of 360 million USD in the Binh Duong province in 2006. This is a large FDI project in the province, which selected Ben Cat Town to build their factory. This project has made an important contribution in promoting the overall socioeconomic development of Ben Cat Town in particular and the Binh Duong province in general. In the first 6 months of 2018, the economic situation of Ben Cat Town developed considerably, with a total production value of more than 49,000 billion VND, increasing by 17.77% compared to that of the same period last year.

(2) The project of high-quality packaging production of SCG Siam Cement Group (Thailand) had a phase 1 investment capital of 140 million USD in My Phuoc 3 Industrial Zone of the Binh Duong province in 2007. The company produces all kinds of packaging in industries such as food production, apparel, footwear, and electronics. In the third quarter of 2007, its packaging manufacturing factory was built in My Phuoc 3 Industrial Zone of the Binh Duong province. The initial capital for the project was 140 million USD and is expected to be 220 million USD in total. The capacity is estimated 220,000 t/year, and 70% of the outputs are consumed domestically. This is considered to be the largest packaging manufacturing factory in Vietnam.

(3) The project of My Phuoc Eco-Urban Area was invested in and developed by SP Setia Berhad Group (Malaysia), Becamex IDC and Treasure Link. The project is built on an area of 226 h. The investment capital was up to 620 million USD and is considered as one of the biggest projects in 2007. The project was opened for sale in the first phase in October 2009, with about 10,000 houses, including villas, townhouses, and apartments. This project had a positive impact on the housing issues of the people in the province and neighboring provinces. Further, the project contributed to improving the life quality of the people due to its ecological urban nature, with the creation of many places such as parks, swimming pools, condominiums, luxury villas, entertainment and commercial areas, international schools, etc.

(4) The project of the beverage factory of Kirin Acecook Vietnam (Japan) had an investment capital of 60 million USD. This project is a joint venture between Japanese beverage group-Kirin (51%), Japanese Acecook Group (39%), and Vietnamese Acecook Company (9%). This joint-venture enterprise built its factory on a 2.7-hectare plot of land in My Phuoc II Industrial Zone of the town of Ben Cat (Binh Duong province). The first phase of the project had an investment of 34 million USD, with a design capacity of 4 million barrels/year. The second phase of the project raised the capacity to about 10 million products/year. This project contributed by providing about 500 jobs for local workers.

Hypothesis 3 is partially supported. We found that the variable of FDIEMP has a significant and positive impact on provincial sustainability at a confidence level of 95% (Coef. = 0.093; $t = 3.50$; $p = 0.001$). This means that the larger the number of employees working in the FDI sector, the higher

the sustainability of a province. In fact, FDI enterprises not only create jobs and reduce unemployment significantly but also create high economic value for host provinces. Hence, these enterprises have a significant impact on provincial sustainability by improving people's lives and the understanding of environmental protection.

In addition to minimizing transaction costs, FDI enterprises mainly invest in industries that are in line with modern development trends such as manufacturing, processing, construction, and service. These enterprises significantly influence the sustainable development of host provinces through labor restructuring from agriculture to industry and services that are consistent with the general trend of the world.

The other two variables of FDICOM (Coef. = -0.008 ; $t = -0.53$) and FDIWAG (Coef. = 0.343 ; $t = 0.96$) have no significant impact on provincial sustainability at a confidence level of 95%. Currently, the income of labor and contribution to the salary of the FDI sectors in provinces is limited. Under the transaction cost approach, to avoid facing domestic increase in transaction costs, FDI enterprises make the most of cheap labor sources in host countries in general and provinces in particular. Hence, these enterprises only focus on taking advantage of low-cost human resources but pay little attention to the training and benefits of employees in a province.

FDI enterprises focus on exploiting the labor market of an emerging economy and only pay low wages. Therefore, the income of labor and contribution to the salary of the FDI sector do not have a significant impact on provincial sustainability. In addition, in FDI enterprises, highly paid employees are mainly high-quality human resources. This partly explains why the two variables of FDICOM and FDIWAG do not have a significant impact on provincial sustainability in the current context. Empirically, Ridzuan et al. [34] found that FDI inflows widen income disparity in the host country, which may disrupt sustainable development.

In general, the host country and its provinces should focus on increasing the number of employees working in FDI enterprises, because this indicator has a significant and positive impact on provincial sustainability. At the same time, to improve sustainability, national and provincial governments should implement solutions to promote training activities and benefits for employees in these enterprises.

Note 2: Negative Impact of FDI on the Sustainability of Vietnam Provinces.

There are some FDI projects that negatively affect the economy by exhausting natural resources and seriously influencing the environment. In particular, these FDI projects create competitive pressure on the domestic enterprises. Further, they increase the risk of importing outdated technologies affecting economic development. In addition, these FDI projects cause an imbalance between sectors of the economy because they often focus on key industries such as manufacturing and energy. In addition, some illegal organizations have poured FDI into Vietnam for money laundering. This results in several adverse consequences for the environment, such as environmental pollution, imbalance of the ecosystem, and even destroying biodiversity. For example, some FDI projects that have a negative impact on the sustainability of Vietnam provinces include:

(1) Vedan Company of the Vedan Group (Taiwan), with a total investment of 422 million USD in the Dong Nai province created the Thi Vai "dead" river because of the huge amount of waste. Vedan designed and installed its pump and technical piping system as to pump liquid waste from the lysine factory, monosodium glutamate factory, and polyglutamic acid (PGA) production factory from their tanks of $6000\text{--}7000\text{ m}^3$ volume and $15,000\text{ m}^3$ into the Thi Vai River. Vedan's installation of its waste discharge system violates the technical process of waste treatment (wastewater and liquid waste) and the legal provisions of Vietnamese law on environmental protection.

(2) Eminence Iron and Steel Factory in the Thanh Hoa province (30 billion USD) utilized land and other resources of Vietnam. Specifically, according to the investors of this project, in the first phase, they installed four blast furnaces, each of 550 m^3 , all built with Chinese equipment. However, at that time, the Chinese Government only permitted them to invest and build new steel mills with a furnace scale of 1000 m^3 or more. This is because steel mills of less than 1000 m^3 are outdated and inefficient.

(3) The Dragon Beach eco-tourism area in the Quang Nam province (4.15 billion USD) was invested by TANO Capital Group and Global C&D Group (United States). This is considered a super project launched with the purpose of developing marine tourism in the Quang Nam province. However, in the long term, the investors did not pay the deposit and delayed their construction plans. Hence, the Quang Nam province issued a letter requesting the revocation of the license. This super project has left many serious consequences by adversely affecting the lives of people in the project area and the local development progress.

(4) Quang Lian Steel Factory in the Quang Ngai province (4.5 billion USD) is an investment project approved by the government in July 2005 and granted an investment certificate by the Ministry of Planning and Investment in September 2006. However, for 10 years, the investors of the project offered to adjust the investment certificate five times to increase capital, increase capacity, and change legal entities. The Quang Ngai province decided to withdraw this project land due to a violation of land laws in Clause 12, Article 38 of the 2003 Land Law of Vietnam. This project had a negative impact on the sustainability of the Quang Ngai province by making land wasteful while not attracting other investors.

(5) Formosa Steel Factory pollutes the sea area of Central Vietnam. The project of the Iron and Steel Complex and Son Duong Port of Hung Nghiep Formosa Ha Tinh Iron and Steel Company Limited (Formosa Ha Tinh Company) was granted an investment certificate in 2008 with a total registered investment capital of phase 1 of 10.548 billion USD. This project caused massive fish deaths in Vietnam in 2016. The massive fish deaths in the Vung Ang sea (Ha Tinh province) started on 6 April 2016 and then spread to the sea areas of Quang Binh, Quang Tri, and Thua Thien-Hue. These fish deaths had a big impact on the production and livelihood of fishermen, on coastal aquaculture households, and on sea tourism. The reason is that polluting waste from Formosa Ha Tinh Company exceeds the allowable maximum limit. The large source of waste from this enterprise's factory contains toxins that develop a complex form, causing massive fish deaths.

5. Implications and Conclusion

This study focused on analyzing and assessing foreign direct investment and provincial sustainability using the transaction cost approach. The focused research context was Vietnam, where promoting sustainable behavior and development has become very important [47–49]. First, we systematized the theoretical framework of FDI, sustainable development, and transaction cost approach on the relationship between FDI and the environment. On that basis, we developed three hypotheses to study the impact of FDI on provincial sustainability. We used the adjusted net savings (ANS) of World Bank to assess the sustainable development of Vietnam provinces as a dependent variable. This indicator has been used by many researchers globally to assess the sustainable development of a country or a province. The independent variables used in this research were distinguished into three groups, associated with (i) the FDI inflow stocks, (ii) employment in the FDI sector and (iii) the performance of FDI in provinces.

The independent variables measuring the FDI inflow stocks include (i) the proportion of the number of active FDI enterprises to the number of total active enterprises in a province (FDIENT), (ii) the proportion of capital of active FDI enterprises to the capital of total active enterprises in a province (FDICAP), and (iii) the proportion of fixed asset and long-term investment of active FDI enterprises to the value of total active enterprises in a province (FDIAST). The independent variables measuring the performance of FDI consist of (i) the proportion of net turnover of active FDI enterprises to this value of total active enterprises in a province (FDITUR), (ii) the proportion of GDP generated by the FDI sector to the total GDP of a province (FDIGDP), (iii) the return on value of fixed asset and long-term investment of FDI (FDIOROFA), (iv) the return on total capital of FDI (FDIOTC), and (v) the return on sales of FDI (FDIROS). The independent variables measuring employment in the FDI sector involve (i) the proportion of the number of employees in FDI enterprises to the number of employees in total enterprises in a province (FDIEMP), (ii) the proportion of compensation of FDI

employees to the total compensation of total employees in a province (FDICOM), and (iii) the difference between the monthly average compensation of an employee working in an FDI enterprise and the average one (of all kinds of employees) in a province (FDIWAG).

We chose 63 provinces of Vietnam for the empirical study, using the data from statistical yearbooks of Vietnam's provinces during the period from 2010 to 2016 to investigate the impact of FDI on provincial sustainability. In addition, the regression models used panel data and were regressed in three ways, namely (i) pooled OLS model, (ii) random effects model, and (iii) fixed effects model. Next, the Lagrange multiplier (LM) was used to select whether the random effects model or the pooled OLS model was suitable for this research. The fixed effects model and the random effects model were compared using the Hausman test.

The regression results indicated that the capital of FDI enterprises (FDICAP) and employment in the FDI sector (FDIEMP) have positive and significant impacts on province sustainability. By contrast, the value of fixed asset and long-term investment of an FDI project and province size negatively influence province sustainability. Our findings imply that host provinces in particular and host countries in general should prioritize the quality of FDI projects in terms of capital and not by the number of FDI projects. In particular, the host provinces should focus on effectively controlling FDI projects that have an important value of fixed assets and long-term investment to ensure provincial sustainability. In addition, host provinces should pay attention to increasing the number of employees working in FDI enterprises because this indicator has a significant and positive impact on provincial sustainability. At the same time, to improve sustainability, the national and provincial government should implement effective solutions to improve training activities and welfare for the employees in these enterprises.

On the basis of the research results, we propose some policy implications to improve the performance of FDI, thereby promoting the sustainability of host provinces in particular and host countries in general, as follows:

First, the government and provincial governments should institute new approaches to policy and strategy development to attract FDI to ensure provincial sustainability. Specifically, FDI attraction should concentrate on capital, not on the number of projects. At the same time, FDI projects must support industrial upgrade by helping provincial enterprises to integrate into global production networks. Policymakers should comprehensively revise the current preferential policy framework for FDI competition based on provinces' advantages and strengths.

Second, the FDI policies should gradually reduce dependence on FDI because this dependency affects the sustainable development of provinces by making the provincial economy susceptible to risks from global economic fluctuations. At the same time, provinces should have effective policies to proactively attract FDI capital for different sectors, especially those that bring more added value, such as processing, logistics services, primary metal manufacturing, mining, etc.

Third, host countries and provinces should have specific policies that strengthen the connection between FDI enterprises and domestic suppliers to promote provincial sustainability. These policies involve the establishment of a database of FDI enterprises, suppliers, connection services, and investment promotion programs for attracting foreign investors and supporting domestic enterprises.

Fourth, host countries and provinces should systematically review legal restrictions and procedural barriers of attracting FDI in priority areas to ensure provincial sustainability by easing the rules associated with foreign investors' ownership and capital for key fields. In addition, institutional reforms and simplification of administrative procedures should be promoted to increase the performance and transparency of FDI enterprises.

Fifth, the government and provincial government should review the policies relating to the contribution of FDI enterprises to host countries and host provinces, especially the issues relating to the environment, natural resources, labor training and development, and welfare of employees in FDI enterprises. Further, policies should focus on increasing the number of employees in FDI enterprises to ensure provincial sustainability.

Sixth, the government and provincial authorities should step up monitoring and supervising the implementation of laws on investment and enterprises in order to promptly detect and handle potential problems as well as law violations around foreign direct investment. This activity aims to limit the negative impacts of FDI on the sustainable development of provinces. At the same time, authorities should urgently issue documents guiding new laws relating to FDI and sustainable development at the provincial level to ensure the performance of FDI and sustainable development of host countries in general and provinces in particular.

This research has some significant contributions as follows:

First, we effectively validated theoretical frameworks relating to FDI, sustainable development, and the relationship between FDI and provincial sustainable development using the transaction cost approach. On that basis, we developed three hypotheses to clarify the impact of FDI on the sustainable development of host provinces.

Second, we successfully implemented empirical research on the impact of FDI on the sustainable development of host provinces. Through data collection from 63 Vietnam provinces, we used regression models such as the pooled OLS model, random effects model, and fixed effects model to determine the relationship between FDI and provincial sustainability.

Third, by collecting the data of 63 Vietnam provinces, this research partly indicates the actual situation of the socioeconomic development of Vietnam's provinces. Since then, the Vietnam Government and provincial governments have had a better understanding of the status of FDI and its impact on sustainable development, hence implementing effective measures to promote sustainable development.

Fourth, through our research findings, we provided some objective assessments on the impacts of FDI on the sustainable development of provinces using the transaction cost approach. These assessments are important for the host countries and provinces.

Fifth, based on the research results, we proposed some policy implications to improve FDI performance, thereby promoting the sustainable development of the host countries in general and provinces in particular.

This study has also some limitations. Essentially, the available data in Vietnam have shortcomings in that they do not always clearly depict the current situation of FDI's impact on provincial sustainability. We assessed only the indirect impacts of FDI on provincial sustainability, while the direct impacts on the environment could not be measured or assessed. We also did not have enough data on the contribution of GDP to a province's import and export to assess the impact of this factor on provincial sustainability. In the future, further studies can possibly focus on analyzing and assessing the impact of each aspect of FDI on provincial sustainability. Additionally, future research can collectively investigate the impact of FDI-related variables and non-FDI-related factors on national and provincial sustainability.

Author Contributions: Conceptualization, H.V.N., T.T.P., and A.L.; methodology, H.V.N. and T.T.P.; validation, H.V.N. and T.T.P.; formal analysis, H.V.N. and T.T.P.; resources, H.V.N.; writing—original draft preparation, H.V.N., T.T.P., and A.L.; writing—review and editing, H.V.N., T.T.P., and A.L.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Chandran, V.; Tang, C.F. The impacts of transport energy consumption, foreign direct investment and income on CO₂ emissions in ASEAN-5 economies. *Renew. Sustain. Energy Rev.* **2013**, *24*, 445–453. [\[CrossRef\]](#)
2. Pao, H.T.; Tsai, C.M. Multivariate granger causality between CO₂ emissions, energy consumption, FDI (foreign direct investment) and GDP (gross domestic product): Evidence from a panel of BRIC (Brazil, Russian Federation, India, and China) countries. *Energy* **2011**, *36*, 685–693. [\[CrossRef\]](#)
3. Kogut, B. Joint ventures: Theoretical and empirical perspectives. *Strat. Manag. J.* **1988**, *9*, 319–332. [\[CrossRef\]](#)
4. Hennart, J.F. A transaction costs theory of equity joint ventures. *Strat. Manag. J.* **1988**, *9*, 361–374. [\[CrossRef\]](#)

5. Tsang, E.W. Transaction Cost and Resource-Based Explanations of Joint Ventures: A Comparison and Synthesis. *Organ. Stud.* **2000**, *21*, 215–242. [[CrossRef](#)]
6. Meyer, K.E.; Nguyen, H.V. Foreign Investment Strategies and Sub-national Institutions in Emerging Markets: Evidence from Vietnam*. *J. Manag. Stud.* **2005**, *42*, 63–93. [[CrossRef](#)]
7. Reuer, J.J.; Miller, K.D. Agency Costs and the Performance Implications of International Joint Venture Internalization. *Strat. Manag. J.* **1997**, *18*, 425–438. [[CrossRef](#)]
8. Anderson, E.; Gatignon, H. Modes of Foreign Entry: A Transaction Cost Analysis and Propositions. *J. Int. Bus. Stud.* **1986**, *17*, 1–26. [[CrossRef](#)]
9. Gulati, R. Does Familiarity Breed Trust? The Implications of Repeated Ties for Contractual Choice in Alliances. *Acad. Manag. J.* **1995**, *38*, 85–112.
10. Beamish, P.W. The characteristics of joint ventures in the people's Republic of China. *J. Int. Mark.* **1993**, *1*, 29–48. [[CrossRef](#)]
11. Gomes-Casseres, B. Firm Ownership Preferences and Host Government Restrictions: An Integrated Approach. *J. Int. Bus. Stud.* **1990**, *21*, 1–22. [[CrossRef](#)]
12. Hamel, G. Competition for competence and interpartner learning within international strategic alliances. *Strat. Manag. J.* **1991**, *12*, 83–103. [[CrossRef](#)]
13. Inkpen, A.C. Learning and knowledge acquisition through international strategic alliances. *Acad. Manag. Perspect.* **1998**, *12*, 69–80. [[CrossRef](#)]
14. Sbia, R.; Shahbaz, M.; Hamdi, H. A contribution of foreign direct investment, clean energy, trade openness, carbon emissions and economic growth to energy demand in UAE. *Econ. Model.* **2014**, *36*, 191–197. [[CrossRef](#)]
15. WCED. *The report of the world commission on environment and development: Our common future*; Oxford University Press: Oxford, UK, 1987.
16. Bokpin, G.A. Foreign direct investment and environmental sustainability in Africa: The role of institutions and governance. *Res. Int. Bus. Financ.* **2017**, *39*, 239–247. [[CrossRef](#)]
17. Pazienza, P. The relationship between CO₂ and Foreign Direct Investment in the agriculture and fishing sector of OECD countries: Evidence and policy considerations. *Intellect. Econ.* **2015**, *9*, 55–66. [[CrossRef](#)]
18. Le, T.H.; Tran-Nam, B. Relative costs and FDI: Why did Vietnam forge so far ahead? *Econ. Anal. Policy* **2018**, *59*, 1–13. [[CrossRef](#)]
19. Prime Minister. *Implementation of Sustainable Development: National Report at the United Nations Conference on Sustainable Development (rio+20)*; The Government of the Social Republic of Vietnam: Hanoi, Vietnam, 2012.
20. Nguyen, Q.A.; Hens, L.; MacAlister, C.; Johnson, L.; Lebel, B.; Tan, S.B.; Nguyen, H.M.; Nguyen, T.N.; Lebel, L. Theory of Reasoned Action as a Framework for Communicating Climate Risk: A Case Study of Schoolchildren in the Mekong Delta in Vietnam. *Sustainability* **2018**, *10*, 2019. [[CrossRef](#)]
21. Williamson, O.E. *Markets and Hierarchies: Analysis and Antitrust Implications: A Study in the Economics of Internal Organization*; Free Press: New York, NY, USA, 1975.
22. Williamson, O.E. *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*; Free Press: New York, NY, USA, 1985.
23. Williamson, O.E. Efficiency, Power, Authority and Economic Organization. In *Transaction Cost Economics and Beyond*; Groenewegen, J., Ed.; Springer Science and Business Media LLC: Heidelberg, Germany, 1996; pp. 11–42.
24. Hennart, J.F. The transaction cost theory of the multinational enterprise. In *The nature of the transnational firm*; Pitelis, C.N., Sugden, R., Eds.; Routledge: New York, NY, USA, 1991.
25. Wallis, J.J.; North, D. Measuring the transaction sector in the American economy, 1870–1970. In *Long-term Factors in American Economic Growth*; Engerman, S.L., Gallman, R.E., Eds.; University of Chicago Press: Chicago, IL, USA, 1986; pp. 95–162.
26. Coase, R.H. The nature of the firm. *Economica* **1937**, *4*, 386–405. [[CrossRef](#)]
27. Mencinger, J. Does Foreign Direct Investment Always Enhance Economic Growth? *Kyklos* **2003**, *56*, 491–508. [[CrossRef](#)]
28. OECD. *Benchmark definition of foreign direct investment*, 4th ed.; OECD: Paris, France, 2008.
29. Gladwin, T.N. Environment development and multinational enterprise. In *Multinational Corporations, Environment and the Third World*; Pearson, C., Ed.; Duke University Press: North Carolina, NC, USA, 1987.
30. Birdsall, N.; Wheeler, D. Trade Policy and Industrial Pollution in Latin America: Where Are the Pollution Havens? *J. Environ. Dev.* **1993**, *2*, 137–149. [[CrossRef](#)]

31. Hadlock, C.R. Multinational corporations and the transfer of environmental technology to developing countries. *Int. Environ. Aff.* **1994**, *6*, 149–174.
32. Wallace, D. *Sustainable Industrialization*; Earthscan: London, UK, 1986.
33. Wilkins, M. Multinational Corporations: An Historical Account. In *Transnational Corporations and the Global Economy*; Kozul-Wright, R., Rowthorn, R., Eds.; Palgrave Macmillan: London, UK, 1998; pp. 95–133.
34. Ridzuan, A.R.; Ismail, N.A.; Hamat, A.C. Does Foreign Direct Investment Successfully Lead to Sustainable Development in Singapore? *Economies* **2017**, *5*, 29. [[CrossRef](#)]
35. World Bank. *World Development Indicators 2004*; World Bank: Washington, DC, USA, 2004.
36. Hamilton, K.C.M. Genuine savings rates in developing countries. *World Bank Econ. Rev.* **1999**, *13*, 333–356. [[CrossRef](#)]
37. Everett, G.; Wilks, A. *The World Bank's Genuine Savings Indicator: A Useful Measure of Sustainability*; Brenton Woods Project: London, UK, 1999.
38. Pillarisetti, J.R. The world bank's 'genuine savings' measure and sustainability. *Ecol. Econ.* **2005**, *55*, 599–609. [[CrossRef](#)]
39. Gnègnè, Y. Adjusted net saving and welfare change. *Ecol. Econ.* **2009**, *68*, 1127–1139. [[CrossRef](#)]
40. MPI. *Statistical Yearbook of Vietnam 2010 to 2016*; Ministry of Planning and Investment of Vietnam: Hanoi, Vietnam, 2016.
41. API. *Statistical Yearbook of Vietnam Provinces 2010 to 2016*; Agencies of Planning and Investment of Vietnam provinces: Hanoi, Vietnam, 2016.
42. Breusch, T.S.; Pagan, A.R. The Lagrange Multiplier Test and its Applications to Model Specification in Econometrics. *Rev. Econ. Stud.* **1980**, *47*, 239. [[CrossRef](#)]
43. Hausman, J.A. Specification Tests in Econometrics. *Econometrica* **1978**, *46*, 1251. [[CrossRef](#)]
44. Dougherty, C. *Introduction to Econometrics*; OUP Oxford: Oxford, UK, 2011.
45. Torres-Reyna, O. *Panel Data Analysis Fixed and Random Effects Using Stata (v. 4.2)*; Data & Statistical Services, Princeton University: Princeton, NJ, USA, 2007.
46. Greene, W.H. *Econometric Analysis*; Prentice Hall: Upper Saddle River, NJ, USA, 2008.
47. Van Huy, L.; Chi, M.T.T.; Lobo, A.; Nguyen, N.; Long, P.H. Effective Segmentation of Organic Food Consumers in Vietnam Using Food-Related Lifestyles. *Sustainability* **2019**, *11*, 1237. [[CrossRef](#)]
48. Nguyen, N.; Greenland, S.; Lobo, A.; Nguyen, H.V. Demographics of sustainable technology consumption in an emerging market: The significance of education to energy efficient appliance adoption. *Soc. Responsib. J.* **2019**. [[CrossRef](#)]
49. Nguyen, H.V.; Nguyen, N.; Nguyen, B.K.; Lobo, A.; Vu, P.A. Organic Food Purchases in an Emerging Market: The Influence of Consumers' Personal Factors and Green Marketing Practices of Food Stores. *Int. J. Environ. Res. Public Heal.* **2019**, *16*, 1037. [[CrossRef](#)] [[PubMed](#)]

