

# Trade relationship of Vietnam from the perspective of the China-US trade War 2019: A comparison study using the Gravity Model

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## Abstract

**Purpose:** This study aims to evaluate the determinants of the trade relationship between the two largest trading partners of Vietnam, the United States, and China.

**Methodology:** This study is completed using the gravity model for time series data from 1986 to 2019.

**Main Findings:** The study found that the economic growth rate plays a crucial role in stimulating the trade flow. Both trade relationships fit with the practical approach of the gravity model, stating that trade flow increases between countries with different income levels. The most important finding of this study lies in the results regarding the impact of the trade war 2019 between the United States and China. The trade war 2019 can be compared with the study in previous 2015 on trade agreements between ASEAN and China produced trade diversion.

**Implications:** As China expands its markets among ASEAN countries, Vietnam should diversify its export markets to improve its export flow in the trade agreement. But export and import correlation compared the effect of US – VN and China – VN change in the period of a trade war after five years.

**Novelty:** This paper has studied the determinants of trade flows between VN-US and VN-CN to provide a detailed comparison. The input and output stream in gravity frame.

## INTRODUCTION

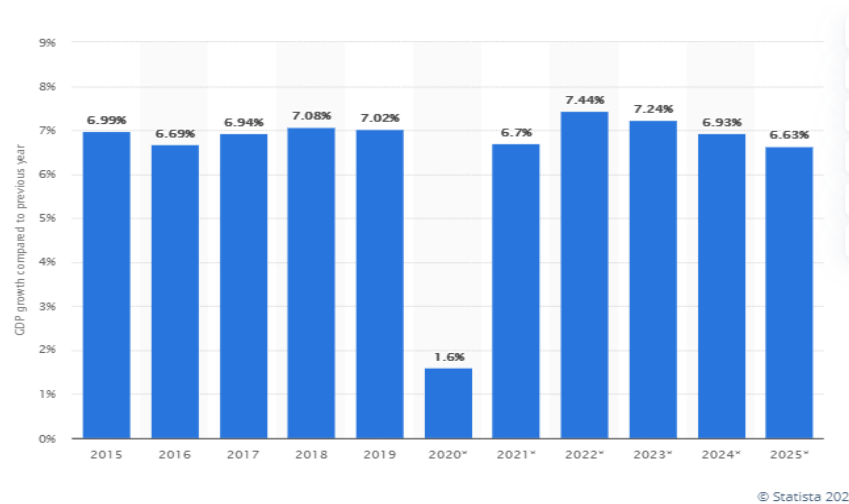
Vietnam (VN) has recently witnessed a significant increase in economic growth rate, which peaked at about 7.02% in 2019 due to rapid development in international trade with some large partners, including the United States (US) and China. The basic structure of the Vietnamese economy will be retained if the epidemic is kept under control in the first half of 2020. If this scenario holds, the economy will rebound at a growth rate of 6.8 percent in 2021 and continue to grow strongly for an extended period. Even though economic growth is dwindling and the risks from the COVID-19 pandemic remain, Vietnam still has one of the fastest economic growth rates in Southeast Asia. The drivers for economic growth in Vietnam are the emerging middle class and the rising number of household and small business activities. Therefore, the domestic business environment is expected to improve rapidly.

Government expenditure, which was implemented as a response to the spread of the epidemic, has risen sharply in the first three months of 2020. It is believed that the large number of bilateral and multilateral trade agreements in which Vietnam participates will help expand market access and boost the national economy. The need to understand the determining factors of bilateral trade volumes of Vietnam and the two largest trading partners, China, and the US, urges the complementation of this study. Stimulation is that analyzing the trade performance of Vietnam toward these two trading partners helps to promote further development of bilateral trade.

The author employed cross-section data to measure a country's trade volumes and determine factors with its all-trading partners in a specific year. Although that research can cover a range of trading partners, they could not consider each partner's unique characteristics, hindering the solutions for each market separately. Therefore, this study will use time series data and focus on two specific trade partners of Vietnam to produce historical relationship background and specific determining factors which make this study more significant.

Vietnam benefits from its geographical characteristics with a long sea coastline and large population and is the entrance gate to Laos, Thailand, and Cambodia through the sea. Its sea coastline is 3,260 km, in the S-letter shape, which enhances international trade through sea transport. Vietnam ranked 15<sup>th</sup> most populous country in the world with 96.2 million people in 2019, most of whom belong to the working age group. This advantage creates cheap labor and a large consumer market that attracts foreign investors. Vietnam borders China in the north, Laos in the northwest, and Cambodia in the southwest. Laos, Thailand, and Cambodia are landlocked countries, so most of their cargo is transported through Vietnam's Sea, enforcing sea and road transport for Vietnam. Vietnam experiences a high economic growth rate due to its successful integration into the world market. Vietnam built a diplomatic relationship with 172 countries by 2007 and became a member of the World Trade Organization in 2007. It is also a member of the United Nations and the Association of Southeast Asian Nations, including ten countries (ASEAN). It soon reformed the economy in 1986 with the Renovation scheme, changing the country from a planned economy to a socialist market-oriented economy. Also, the export-oriented strategy has been an engine of economic growth for Vietnam. China and the United States are the two most prominent active trading partners. In the context of this study collection, the data in 2019

hear from the trade war between China and US. Also, Covid 19 pandemic affected the economy in the last quarter of the end of 2019 and the beginning of 2020. It is the reason to conduct this study compared with previous studies in the context of the trade agreement.

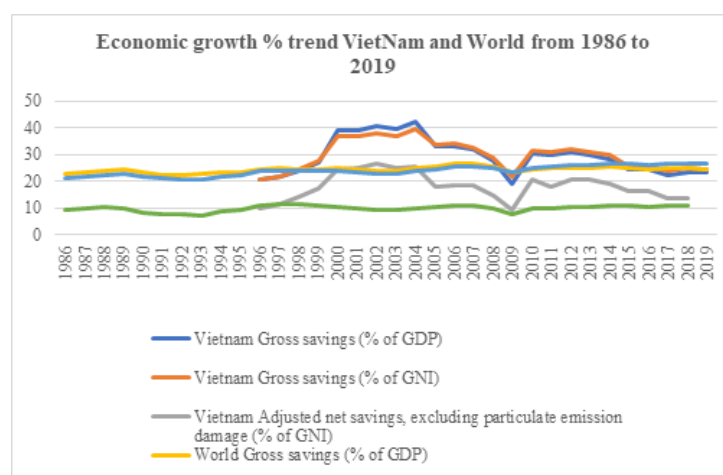


**Figure 1:** The economic growth in GDP VietNam from 2015-2019 and forecast 2021-2025

Figure 1 shows the economic growth of Vietnam during the 2015-2019-year period, in which the rate Stable and decreased in 2020 as an outlier point but recovered as forecast in 2021, and the trend kept up. The Global Financial Crisis reversely impacted Vietnam in 2008, evidenced by the decrease in the growth rate to about 5.6%. After that, the rate recovered to more than 6% in 2010. During 2011-2012, Vietnam conducted the equalization for state-owned enterprises and restructured financial institutions, causing a reduction in the growth rate to around 5%. However, it soon recovered and peaked at about 7% in 2019. Vietnam achieved a high growth rate over 30 years, and international trade was essential to this success.

However, recently significant territorial tensions in the China Sea have occurred between Vietnam and China. The tension escalated to neighboring countries like Indonesia, the Philippines, and Japan, forcing the United States to speak out and get involved in a territorial dispute to fight against China's illegal actions. These territorial tensions influence the trade relationship; therefore, it is necessary to reexamine trade volumes to measure the impact. This study aims to convey this goal. The remainder of this study is divided into five sections. The following section presents the historical background of the Vietnam-China and Vietnam- United States relationship. Section three briefly reviews the existing literature which applied the gravity model to measure international trade.

With the world trend, the rate increased steadily from 1998 until 2004, and the percentage was always higher than the average of the world trend; the lower decreased in 2009 but recovered later in the period 2010-2017—the data presented in figure 2.



**Figure 2:** Economic growth % trend VietNam and World from 1986 to 2019

## Objective/Target

The results lead to the following vital inferences to compare the paper "evaluation of the trade relationship between Vietnam and china; Vietnam and united states: a comparison using a gravity model." Previous research finds out: Firstly, the result for the GDP growth rate for the VNUS trade relationship is positive and significant in imports, while for CN-VN, the variable is positive and significant in the case of export. So economic growth becomes one of the most critical variables in explaining the trade flow tendency. Also, this result fits with the actual data because the export rate to the

US increases faster than the import rate from the US, whereas the import rate from China rises at a higher speed than the export rate to China. Secondly, it is interesting to note that the coefficient of GDP per capita indicates both positive and significant at 1% in the VN-US trade relationship and VN-CN trade relationship. The magnitude of the coefficient for export is higher than that for import in VN-US trade, and the reverse result is found in VN-CN trade. Thus, there is strong statistical support for the Heckscher-Ohlin theory. The difference in income level between the two countries pushes up the trade. This finding is like [Batra \(2006\)](#), [Nguyen \(2010\)](#), and [Xuegang \(2008\)](#).

Finally, the estimated coefficients of trade agreement and trade war between two trade relationships yield opposite results. While the bilateral trade agreement between US and VN strengthens bilateral trade, the formation of the ASEAN trade agreement with China has weakened bilateral trade between China and Vietnam. One remarkable fact is that the US has different comparative advantages in production and consumption from Vietnam. In contrast, Vietnam has similar comparative advantages in production and consumption with other ASEAN countries. As a result, the US trade partner prefers to trade with Vietnam. China transfers its trade destination to other ASEAN countries. Hence, Vietnam should search for more export destinations to promote export flows further to weaken its dependence on the Chinese market. In addition, to reduce the dependence on imports from China, there is a need to seek other import markets in the regional and world markets.

This paper's research has investigated the determinants of trade flows between VN-US and VN-CN to provide a detailed comparison. The export flow and import flow models are derived within the gravity framework. The results fit the actual data and yield highly significant results. The results suggest that GDP growth between the two countries fosters the export and import flows. In addition, it seems reasonable to conclude that GDP per capita strongly impacts trade flow, indicating that income level is significant in explaining the trade flows. It proves the practical approach of Heckscher-Ohlin's theory on trade. Perhaps the study's most important finding is that US-VN bilateral trade agreement produced trade creation, whereas the ASEAN trade agreement with China produced trade diversion. This finding is inconsistent with some previous studies but strengthens the finding of [Nguyen \(2010\)](#) when he found the trade diversion between AFTA member countries and the EU. These results suggest the important trade policies for Vietnam to diversify its export and import destinations.

### Meaning of research paper

This study aims to evaluate the determinants of the trade relationship between the two largest trading Partners of Vietnam, the United States, and China. This study uses the gravity model for time series data from 1986 to 2019. The study found that the economic growth rate is crucial in stimulating the trade flow. The study compares continuously with the previous research data collected in 2015 and published in a research paper "evaluation of the trade relationship between Vietnam and China; Vietnam and United States: a comparison using a gravity model." Both trade relationships fit with the practical approach of Heckscher-Ohlin's theory, stating that trade flow increases between countries with different income levels. The most important finding of this study is the results regarding the impact of trade agreements. While the United States-Vietnam bilateral agreement creates trade, the trade agreement between ASEAN and China produced trade diversion. As China expands its markets among ASEAN countries, Vietnam should diversify its export markets to improve its export flow.

### LITERATURE REVIEW

According to [Gul and Yasin \(2011\)](#), the gravity model is derived from Newton's Law of Everything Suction force. Theory shows that the force of attraction between two bodies depends on the corresponding "mass." In economics, gravity models are used to measure the determinants of trade flows (exports and imports) in terms of distance, economies of scale, and income between exports xuất country and country of import. This model became famous for estimating trade flows between trading partners and is often used in literature. Literature spreads from developed to developing countries, including extensive literature on developed Nations.

Regarding developed countries, [Bergstrand \(1990\)](#) examined the determinants of intra-industry trade in fourteen major industrialized countries in 1975. Focused on the supply and demand of per capita income, this author includes capital and labor ratios. GNP, population, and dummy variables are considered in the model. Plenty of studies mention developing countries and ASEAN. Among them, [Nguyen \(2009\)](#) employs Hausman-Taylor estimation with a two-way error component form to measure the export flows among 39 countries in ASEAN free trade area from 1988 to 2002. The author found that an increase in GDP strengthened export, and the ASEAN Free Trade Agreement intensified export among members ([Nguyen 2009](#)). The author measures each partner's GDP separately, unlike [Batra \(2006\)](#), who combines them into one variable. The research purpose can explain that [Batra \(2006\)](#) targeted to examine the application of Heckscher-Ohlin's theory while [Nguyen \(2009\)](#) did not. The author measures the effects of shared borders and differences between industry groups due to industry characteristics. Research shows that inequality between two partners' per capita GDP, national income, and tariff levels will decrease intra-industry trade ([Bergstrand, 1990](#)). This result is explained that the greater inequality in per capita income comes from more significant differences in tastes. Specifically, the proportion of labor capital used to explain the impact on trade depends on the product type. Trade would increase if the average capital-labor ratio were high in case the good is capital intensive, and otherwise, in case the good is labor intensive.

[Batra \(2006\)](#) applied the gravity model to investigate potential trade between India and 146 partners in 2000. Along with examining the commercial potential, the author also considers the application of the Heckscher-Ohlin theory or Linder

theory. If the Heckscher-Ohlin theory were applied, countries with different income levels would trade more with each other. At the same time, the Linder theory shows the opposite trend. The difference in GDP per capita between two trading partners is a proxy for the difference in income levels that can be used to measure the application of the Heckscher-Ohlin theory or the Linder theory. GNP per capita is included in the model to show the relationship between trade flows and the level of development. Other variables are also included, such as the geographical distance between two trading countries; some dummy variables are used as trade resistance indicators, such as common border, everyday language, landlocked country, an island nation, regional trade, and colonial links agreement (Batra 2006). This study shows the difference in GNP between the two trading partners has a positive relationship with trade, demonstrating that the Heckscher-Ohlin theory has been applied. Other variables show expected signs; for example, geographic distance is still a negative mean trade reduction relationship seen if the gap increased.

If two countries share the same border and language, they will get the growth of trade due to these advantages. However, landlocked countries are at a disadvantage in international trade. Research on India's potential trade shows that trade with China will double without barriers and constraints, and India will reap many trade benefits with Pakistan. A study of trade flows between Pakistan and 42 partners from 1981 to 2005 was carried out by Gul and Yasin (2011), who applied gravity models to evaluate the effects of GDP, GDP per capita, shared borders, common language, and common socio-economic region. Similar to other studies, this study shows a positive effect of economic size and income per capita. This case is consistent with the Heckscher-Ohlin theory, as income differences lead to increased trade. However, the results for the common border were negative, in contrast to other studies.

Notably, Pakistan trades with neighboring countries 78% less than expected. This finding results from "policies restricting trade with India and unrecorded trade with Iran" (Gul and Yasin, 2011, p. 37), two countries with a common border. Thus, dealing with the South Asian Association for Regional Cooperation (SAARC) is 17% lower than trade with the rest of the world due to political tensions and conflicts in the region where Pakistan and India are two major partners. Trade with ECO. Countries (Organization for Economic Cooperation) were similar, less than expected. From the results, the authors suggest that Pakistan should reduce trade barriers, improve its transport and infrastructure network, improve export quality, and focus more on trade with ASEAN and the Middle East, where Pakistan could benefit from a potential trade expansion. Also, Abbas and Waheed's study of Pakistan's trade relationship (2015) looked at the factors of Pakistan's export flows to 40 trading countries between 1991 and 2011, using the gravity model.

They explained the reason for using the log-linear model to solve the problem of heteroscedasticity and serial correlation. Like previous research, they found a positive relationship between export and supply capacity and partner countries' demand, whereas distance indicates a negative impact. Surprisingly, they found the insignificant impact of the dummy variable represented the free trade agreement which was expected to be a positive and significant influence on trade (Abbas and Waheed, 2015). Unlike previous studies, this research considered the impact of the relative price level, calculated by the nominal exchange rate and the ratio between the domestic price index and the partner's price index. The result shows that if the domestic currency devalued, export would increase. Instead of using GDP per capita, Abbas and Waheed (2015) applied the population variable, representing the market size and labor supply capacity. The result shows a positive impact of population on export, proving that a large population stimulates export due to its readiness for labor supply. As expected, common language contributes to an increase in export flow. However, unlike other studies, they found the surprise result that common border is a resistant factor for export. According to Gul and Yasin (2011), only India and Iran share a border with Pakistan. The joint border's negative impact was due to trade constraints among those nations. Abbas and Waheed (2015) also calculated the ratio of potential trade using the gravity model and the actual trade to find the potential partner. Among Pakistan's partner countries, Europe became the most potential trade partner.

Taguchi (2013) conducted a study to compare Thailand's trade integration with the Mekong region and advanced ASEAN, China, India, Japan, and the United States. The author has used the gravity model for panel data from the 1980s to the 2000s. Findings show that despite trade with the Mekong region increased significantly during the period, trading volume was lower than in ASEAN. It is due to the higher cost of service linkage of remote-controlled production blocks in the Mekong region, hindering Thailand's commercial expansion. Still, the success of the Greater Mekong, the sub-regional agreement signed in 1992, has promoted a steady increase in trade flows and improved regional infrastructure.

Like Batra (2006), Xuegang (2008) applies the gravity model to determine the factors of the bilateral trade volume of Xijiang, a northwest region of China, with its trade partners. The author used cross-sectional data in 2004 and found similar results to Batra (2006). GDP and GDP per capita show a positive relationship with trade, while the gap constrains international trade (Xuegang, 2008). From the results, the author concluded that Xijiang had successfully cooperated with all its trading partners, among which Xijiang's relationship with West Asia is a bit slower than with other partners.

Working on the entire China situation, Abraham and Hove (2005) conducted a study to determine which trade agreement China should join and apply the gravity equation for 23 Asia-Pacific countries from 1992 to 2000.

These authors find that the GDP growth of importing and exporting countries (tested separately) positively affects export flows. At the same time, both the distance variable (absolute value) and scaled distance variable (used as weight scale) negatively impact exports. Common language and population size contribute to the increase in marketing. However, unlike Abbas and Waheed (2015), Abraham and Hove (2005) find the negligible effect of the exchange rate variable. Surprisingly, joining ASEAN and APEC did not contribute much to the region's export flows, while export flows largely



depend on growth, trade barriers, and a common language. China is called the "workshop of the world" ([Abraham et al. Hove, 2005, p. 489](#)) because it imports most of its inputs and ultimately exports products to the world market. China's main trading partners are in the Asia-Pacific region, with about 80% of exports to neighboring countries in 2000 and 71% of imports from the region. China's leading importers of consumer goods are underdeveloped Asians, and its leading exporters of capital goods come from the more advanced Asian economies.

There is no evidence of trade formation due to joining ASEAN or APEC. The export potential from ASEAN countries to China is expected to increase as this rate increases between the predicted value and the actual value more than ten times. As a result, the author found that joining the RTA with ASEAN will bring more excellent mutual benefits to China and the region than rather than joining an RTA with APEC or APEC Asia. [Huo and Kakinaka \(2007\)](#) assessed Cambodia's bilateral trade flows with 20 trading partners from 2000 to 2004. This period marked Cambodia's participation in the ASEAN Free Trade Area.

These authors usually apply gravity models to evaluate the impact of GDP, GDP per capita, and distance on bilateral trade. When they used the enhancement software model, they added a variable for the exchange rate and a new variable that had not appeared before the trade suitability index. The trade relevance index measures trade complementarity between Cambodia and its partners ([Huo and Kakinaka, 2007](#)). All the estimated coefficients indicate the expected signs. The findings show that trading the complementarity or difference in factor assets significantly promotes bilateral trade. The whole GDP and GDP per capita show a positive effect on trade, with GDP being more substantial and having more influence than GDP per capita.

Regarding the geographical distance variable, longer distances will hinder bilateral trade as transportation costs increase. Cambodia exports most agricultural products, which are said to have higher transportation costs due to weight, size, and the risk of damage if such products have been used for a long time. Unlike [Abraham and Hove \(2005\)](#) but similar to [Abbas and Waheed \(2015\)](#), [Huo and Kakinaka \(2007\)](#) find the negative impact of exchange rate fluctuations on trade. The reason to consider the trade conformity index is to measure trade complementarities between Cambodia and its partners ([Huo and Kakinaka, 2007](#)). All the estimated coefficients indicated the expected signs. The findings show that trade complementarities or factor endowment difference significantly enforces bilateral trade. GDP and GDP per capita indicate a positive impact on trade in which GDP presents a more decisive influence than GDP per capita.

Regarding the geographical distance variable, longer distances will hinder bilateral trade as transportation cost increases. Cambodia exported most agricultural products, which were believed to cost more for transportation due to the weight, size, and damage risk if those products were on the way for a long time. Unlike [Abraham and Hove \(2005\)](#), but like [Abbas and Waheed \(2015\)](#), [Huo and Kakinaka \(2007\)](#) find the negative impact of exchange rate volatility on trade. They explained that the exchange rate volatility might create trade discouraging risk and uncertainty of potential profit. From this result, they suggested that a reduction in exchange rate risk may occur if the global transactions of multinational firms increase. The ASEAN participation finding is opposite to the result of [Abraham and Hove \(2005\)](#).

These authors found that being ASEAN members, their bilateral trade would increase. When these authors calculated the potential trade of Cambodia, they found that trade barriers are believed to exist between Cambodia and its four trading partners such as Spain, Japan, Italy, and Malaysia. Only two research mention the trade relationship in the Vietnamese context. Firstly, according to [To and Lee \(2015\)](#), who researched Vietnam's economic policies, Vietnam implemented a deeper trade liberalization by reducing administrative and technical barriers to trade, cutting off tariffs, the transport and trade margins, and attracting more foreign direct investment. As a result, total trade volume is expected to increase significantly ([To and Lee, 2015](#)). Secondly, [Nguyen \(2010\)](#) applied the gravity model in both static and dynamic form for panel data to measure the impact factors of Vietnam's export flows with its fourteen trade partners. Trading countries' income positively impacted Vietnam's export flows ([Nguyen 2010](#)). Therefore, due to the little research and the significant economic growth resulting from trade development, the research about determinants of international trade among essential trading partners like the US and China, in the context of the growth of foreign trade, will be of high interest to us. Although researching the impact of economic transition on economic freedom in Poland, [Stepniak-Kucharska \(2015\)](#) finds a positive relationship between trade and economic growth indirectly, like some of the above studies. This author used the chain-linked Economic Freedom Index by the Fraser Institute and the Index of Economic Freedom of the Heritage Foundation, and the Wall Street Journal. The author argues that due to world integration to a greater extent, Poland experienced a higher degree of economic freedom index ([Stepniak-Kucharska, 2015](#)). One of the three dimensions of the economic freedom index is economics. However, recent studies using different methods may result in different results than the gravity model. For instance, a study investigating the worldwide growth convergence using cross-country data from World Bank from 2000 to 2013 found no relationship between trade and growth (Gomes, 2015). Gomes (2015) admitted that this study faces some limitations regarding the bias selection data and the application of the Conditional Convergence Model. Once again, it confirms that gravity is the most suitable model for evaluating trade relationships with growth.

## Historical Background about Vietnam and China, Vietnam, and US Relationship

### *Vietnam and China*

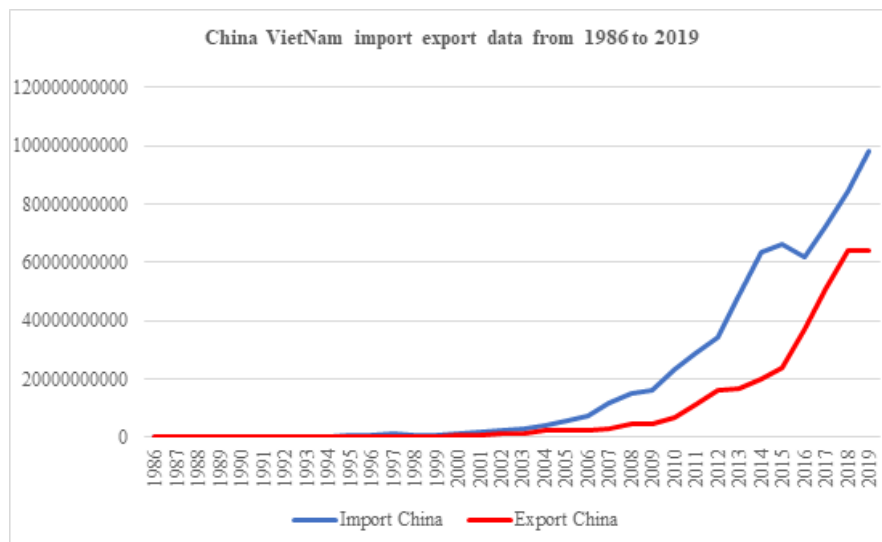
Vietnam shares many common thoughts on culture and political policies with China because not only is China's neighbor, but Vietnam has also experienced many border wars and was under Chinese rule for a thousand years before the 1670s. Vietnam celebrates similarly Lunar New Year and Mid-Autumn Festival, and according to similar customs, a religious

belief such as the rest is a large family with many generations respecting the elderly. Buddhism is significant religion and ancient worship. Like China, Vietnam adopts communist and socialist regimes, prioritizing state-owned enterprises and a planned economy. Both countries have experienced different tastes in diplomatic relationships. Before the Vietnam War, China caused many border wars under the Song, Ming, Yuan, and Qing dynasties. However, during the Vietnam War, 1954-1965, China provided substantial military support to Vietnam against the US, who intended to abolish communist rule in the region.

However, when the Vietnam War ended, China again deployed some fighting on the border and conducted some occupations such as occupying Hoang Sa Island in 1974, waging a border war in 1979, occupying part of the Spratly Islands in 1988, and more recently, illegally occupied by China The China Sea area belongs to Vietnam (Vu, 2013). This action is against the United Nations Convention on the Law of the Sea 1982 and attracted objections from countries in the region, such as the Philippines, Japan, Indonesia, and Vietnam.

It seems that China and Vietnam have successfully built a trade relationship; the result is that China has a significant share of foreign investment in Vietnam and becoming one of the largest countries in the world's important trading partners. Vietnam declared independence from the war against America in 1975 and unified the north and south under communist and socialist regimes. Accompanying the economic renovation to strengthen the economy, Vietnam promulgated the Law on Foreign Affairs Invested in 1987, paving the way for foreign direct investment. China started its investment in 1991, going through two phases. From 1991-2001, China discovered limited opportunities, and investments were established.

However, when China joined the WTO in 2001, it expanded its investment network rapidly, so the second phase, from 2002 to the present, saw a significant increase in investment in Vietnam. Their primary investment areas are resource exploration, real estate, agricultural production, and labor-intensive manufacturing, presented in a study by the Institute of Chinese Studies (ICS) in 2014. For example, the total investment value was 312 million USD in 2013 and quickly increased to 3.2 billion USD in 2014 (ICS, 2014). Regarding trade relations, Vietnam's deficit with China seems more significant over time. Furthermore, local manufacturers rely heavily on cheap price materials imported from China significantly. Although inexpensive materials improve export competitiveness, Vietnam is at risk of being dependent on a significant source of existing territorial tensions. Conducting more excellent and increased investment in Vietnam, Chinese investors would like to exploit the benefits from Vietnam's trade agreements with other countries. Vietnam is a member of the Association of Southeast Asian Nations (ASEAN) EU Free Trade Agreement (EVFTA) (ICS, 2014). It has recently been negotiating to join the Trans-Pacific Partnership among eleven countries. Therefore, Vietnamese producers benefit from preferred tax schemes and other support from members of those trade agreements and associations.



**Figure 3:** China Vietnam import export from 1986 to 2019

Figure 3 indicates the amount of export from Vietnam to China and the number of imports from China to Vietnam. There is a similar trend for both export and import. There are no data for exports until 1989 and imports until 1990. Exports and imports rose significantly from 2001 when imports increased faster than exports. The increase in Chinese foreign direct investment in Vietnam accompanies this trend. It also indicates that about 70% of the input for export production is from China because of the lower price compared to other sources. The gap between export and import enlarges over the period. One reason is the overreaction from China to Vietnam's export price. For example, if Vietnam increased the export price by about 10%, the import price from China would go up by 30%, said to one statistic in 2013 (Le and Ngo, 2014). Another reason is that the main export products are mainly primary products like agricultural products, which are low value-added.

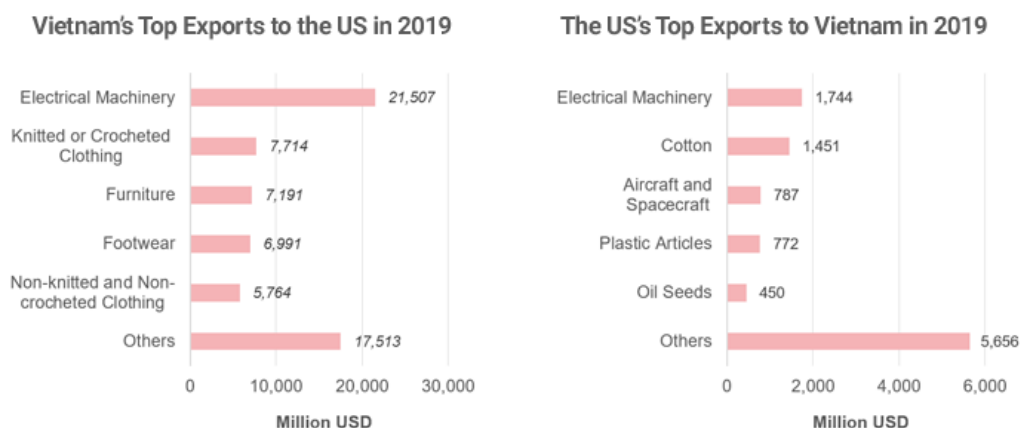
In contrast, the main import products are materials or shoe production and garment production, accounting for higher value-added than exports. Besides, Vietnam imports electronic products, computers, and metals from China. Still, China is one of the largest trading partners, with the peak trade volume reaching 19% of the whole country's trade in 2013 ([Le and Ngo, 2014](#)). From 2017 – 2019, the export value was in line with stability, whereas in 2016, the import went down and later grew up trend.

### Vietnam and US

Like China, the United States has had different roles in Vietnam. The US was directly involved in the Vietnam war from 1955-1975 to abolish the communist regime, causing a lot of cause and effect for people and economies to be destroyed. The US enacted an economic embargo after the war until 1994, creating severe limitations in bilateral relations ([Trang, 2015](#)). When America normalized diplomatic relations with Vietnam in 1994, this relationship turned into a stage. A great success was marked by the Bilateral Trade Agreement of 2001 has brought a massive inflow of investment capital into Vietnam, contributing to economic growth. The United States plays an active and leading role in resolving territorial tensions between China and the United States China and several related Asian countries, including Vietnam, on the China Sea.

Recently, when China illegally occupied the China Sea area belonging to Vietnam, and it escalated by placing their oil rig in 2010 and constructing military bases, the US voiced its demand for China to respect the 1982 Law of the Sea. Moreover, Vietnam became a close central region of the United States' rebalancing strategy because of its consistently high geographic and economic characteristics growth, a member of ASEAN, on the negotiating stage for TPP, by Danny Russel, Support US diplomacy on Asia-Pacific issues ([Nguyen, 2015](#)). Vietnam moves closer to the US due to the existing situation. The relationship between China, Vietnam, and the US have reached another important milestone.

Trade relations between the US and Vietnam developed well after the end of the embargo in 1994 with the establishment of several important agreements. Specifically, foreign affairs between Vietnam and the United States were established in 1995. The Bilateral Trade Agreement was established and signed in 2001. The textile and garment trade agreement was signed in 2003, the airport cooperation agreement was successful in 2003, and approved e-visa for textile and apparel imports into the US have been achieved (State Department, 2015). The US soon became one of Vietnam's largest import partners. For example, it ranked 9<sup>th</sup> largest import partner in 1994, up one place to 8<sup>th</sup> in 1995 and two places to 6<sup>th</sup> in 2000, and total exports to the US accounted for 20% in 2004 ([Ministry of Foreign Affairs, 2015](#)).



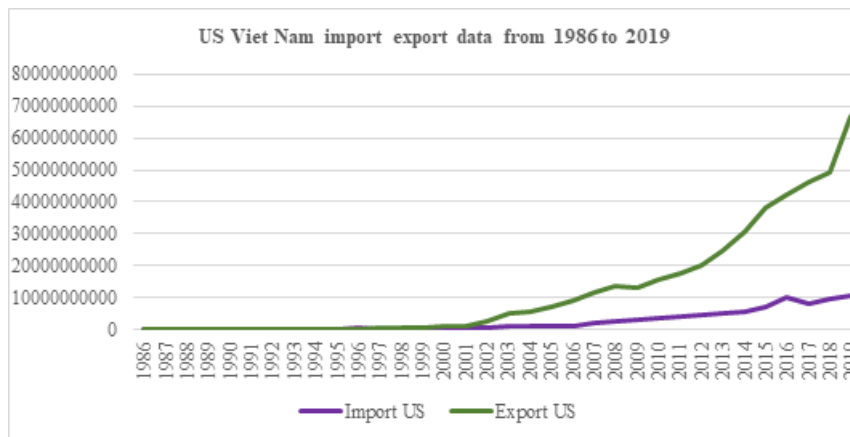
Source: US International Trade Commission

**Figure 4:** Vietnam's US top export import in 2019

Figure 4 shows the main export and import products between Vietnam and America; we can see that Vietnam mainly exported electrical machinery, knitted or crocheted clothing, and footwear. Others can be agricultural and labor-intensive products such as seafood, wooden products, mobile phones and components, computers, and electronic components. However, besides some input materials, Vietnam imports many electronic goods, accounting for a higher value than exports. Many famous American investors have chosen Vietnam as one of their potential destinations. Some big famous electronic investors such as Samsung, LG, Panasonic, Fuji Xerox, Bridgestone, and famous computer companies like Intel built their manufacturing factories in Vietnam which were reported on the website of The City People's Committee ([CPC](#)) in 2016. Those factories boost the electronic export value.

Unlike the trade relationship between China and Vietnam, Vietnam remains surplus with US and this gap tend to increase (see Figure 5). The trend was up and fluctuated in the period 2015-2019, but the primary trend increased. Recently, America opened its market for more variations of Vietnamese seafood and agricultural products ([Ministry of Foreign Affairs, 2015](#)). According to [Lam \(2015\)](#), Vietnam also started to export some new agricultural products to America, like dragon fruit, litchi, and longan. Besides, the export capacity increased by 15% in 2013 due to the increase in workers' skills and the application of new technology ([Lam, 2015](#)). Besides, it tends to transfer garment projects from China to Vietnam because Vietnam offers lower labor costs and supportive legal policies, intensifying export flows to

America. Regarding the FDI, America ranked 7<sup>th</sup> in 2014 because Vietnam benefited from sea transport, cheap and skilled labor, and continuous high economic growth (Lam, 2015).



**Figure 5:** US Vietnam import export from 1986 to 2019

### ***China, the US, and Vietnam***

As the trade war between the US and China stabilizes, Vietnam has progressively ramped up manufacturing, attracting foreign investors and increasing exports to the US. According to official government data, the country's GDP in 2019 remained robust at seven percent, the highest in Southeast Asia. It also enjoyed the second most robust first-quarter growth in the past decade, surpassing only 7.45 percent in 2018. Exports to the US jumped by 34.8 percent in the first nine months of 2019. It is despite the US's import duties imposed in March 2018 on Vietnam's steel products. The tariffs were imposed to prevent steel products that originated from China from attempting to bypass anti-dumping rules. Subsequently, the Vietnamese government issued new regulations related to the origin of exports and imports.

The apparel industry performed exceptionally well, followed by textile companies moving operations to Vietnam from China. The developments came even with China's economy slowing down, reducing Vietnam's export to the country by 7 percent. Analysts from the Mizuho Research Institute say that companies relocating from China to Vietnam are expected to continue even if the global economy slows. Vietnam's economy is being driven by consumer spending, which accounts for close to 70 percent of its

GDP. With the third-largest population in ASEAN and the expansion of upper and middle-income earners, the economy is expected to grow further. Manufacturing grew by 12.3 percent.

The US was Vietnam's biggest export market, followed by the EU and China. However, Vietnam also spent US\$57.98 billion on importing goods in the first quarter of 2019, up 8.9 percent. Major import products included equipment and material for production, electronic products, and computer components.

### **Challenges for foreign investors**

While several companies have moved operations to Vietnam, new investors continue to find it challenging. This is because of the lack of the same level of manufacturing infrastructure in China and the quality of sourcing materials. Vietnam's infrastructure, supply chain network, and suppliers represent what China was a few years ago; this is something the government will need to work on. For example, products that require a high level of technical precision, like aerospace parts, might be more complex to source in Vietnam. A simple search for suppliers of plastic, for example, on an online website yields a small number of potential Vietnam manufacturers compared to China. Further, China's wages have risen 60 percent since 2011, which has put a strain on profits, particularly for labor-intensive industries. Still, Vietnam's wages tend to be low at US\$132 to US\$190 per month, depending on the region, compared to US\$163 to US\$361 in China.

### **Vietnam's advantages**

Vietnam has a relatively stable government and low wages. In 2018, it unseated Singapore as Southeast Asia's top-grossing market for initial public offerings. In 2010, Vietnam surpassed China for the first time as the leading producer of Nike shoes. In the Ease of Doing Business report by the World Bank, Vietnam's ranked 70 with improvements to accessing credit and payment of taxes. Vietnam recently ratified the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and is working on the EU-Vietnam (EVFTA) free trade agreement, allowing more FDI into the country with lower tariff structures. Vietnam's closer proximity to China and its location in the ASEAN region allow manufacturers to sell and move equipment quicker across the border. It helps companies sell and move goods and equipment from China to Vietnam and vice versa but also helps facilitate trade with its ASEAN neighbors.

### **Reforms Vietnam is Pursuing**

Vietnam will need to continue to invest in hi-tech manufacturing and infrastructure. It will have to facilitate SME development to align further with global supply chains. The government is also looking at disinvesting state-owned



enterprises (SOEs), sometimes marred with corruption and lack of accountability. Corporate governance will also need to be improved to be on par with international standards. Vietnam offers a controlled business environment, particularly for those looking to trade in ASEAN and the larger Asia Pacific region. The market is also suitable for investors looking to use its favorable business environment to sell their products to the US and EU.

### The future impact of the trade war

With the ongoing frosty relations between the US and China, foreign companies have found it pertinent to move operations elsewhere from China. The tariffs have significantly affected small and medium-sized businesses, which have seen costs jump. This has resulted in businesses working with suppliers to find alternate countries, such as Vietnam, to bypass the tariffs. Several others are starting to take control of their supply chains using local expertise. However, it is essential to note that investors are choosing to supplement Chinese operations with low-cost input sources from markets such as Vietnam. Vietnam is benefitting from the trade war. It is emerging as an alternative favorite for companies, but the government still has its work cut out to keep Vietnam competitive while improving its business environment. With a flurry of companies moving operations to Vietnam, costs for land, taxes, wages, and automated production lines are also steadily rising. Foreign investors looking to enter Vietnam must work with local experts to ensure their businesses can reap a return on investment.

### METHODOLOGY

The gravity model stems from the "Law of Universal Gravitation" developed by Newton in 1687, and several researchers have functioned it to apply in international trade flows ([Xuegang, 2008](#)). Trade is decided by demand, which depends on income, so countries' economic sizes are included in the model. Moreover, distance decides the transport cost and management costs. As a result, it is expected to create a negative relationship with international trade. Because the gravity model successfully conveyed the evaluation of bilateral trade, it has been widely applied since the 1960s ([Xuegang, 2008](#)). Besides the core variables like economic sizes and distance, researchers developed other variables that are assumed to impact trade like population, GDP per capita ([Bergstrand, 1990](#); [Batra, 2006](#); [Gul and Yasin, 2011](#)), trade agreement ([Nguyen 2009](#); [Abbas and Waheed, 2015](#)). It is believed that large countries possibly gain economies of scale and enhance their export and high capacity to absorb the import. In addition, countries that are a member of a specific trade agreement or organizations tend to trade with each other more often than they trade with non-member countries. We adopt the formula of gravity model following [Batra \(2006\)](#) with some adjustments for time series data:

$$\ln Trade = \alpha + \beta_1 \ln(GDP_i * GDP_j) + \beta_2 \ln(GDPc_i * GDPc_j) + \beta_3 RTA + u_{ij} \quad (1)$$

Because this study uses time series data, the distance variable is time-invariant, so it cannot be included in the model. Trade: export and import value in a million USD i: export countries, j: import countries RTA: Dummy variable will take 1 when the Bilateral Trade Agreement between US and Vietnam was signed, and when Regional Agreement between ASEAN with China was booming. It is worth conducting a study using time series data for some reasons. The gravity model, used for the cross-section ([Batra, 2006](#)) and panel data ([Nguyen, 2009](#)), can evaluate the determining factors of trade for one country with its trading partners. However, it could not describe the trade relationship between one destination and another in detail. Each destination will have specific characters on culture, distance, and trade policy, so using specific data for China and US, the two biggest trading partners of Vietnam, will pave the way to build the strategies for future trade development. The time-specific effect does not create related impacts on the direction of export, such as potential trends Or business cycles. Time series cannot cover invariant variables like distance, common language, and common border; however, it can describe the trend of bilateral trade over a long period. Therefore, we include those dummy variables in the model.

The sum of log (GDP<sub>i</sub>) and log (GDP<sub>j</sub>) reflects the difference in the economic growth rate between import and export countries to see if it creates trade or diversion. This study uses the GDP growth rate as an alternative variable to GDP because economic growth is expected to contribute to the increase in trade as the economy expands. The economic growth rate is employed to provide a good proxy for economic expansion, accompanied by increased demand for imports. The expanding economy is also due to the contribution of export supply. This approach is like [Abraham and Hove \(2005\)](#), who used economic growth instead of the GDP value. We expected our estimated coefficients of this variable would be positive.

Like [Batra \(2006\)](#), this study will examine the trade relationship between Vietnam and China and Vietnam and the US to see if it follows the Heckscher-Ohlin theory, which indicates the differences in income level between two trading partners will lead to an increase in trade. Otherwise, the Linder theory will apply. The sum of the log of GDP per capita is used as a proxy for the difference in income level. GDP per capita is used as a proxy for the level of economic development, and it is expected that the higher the income per capita, the higher the import demand. The dummy variable for Bilateral Trade Agreement with the US and ASEAN agreement with China is applied. It is assumed that this dummy will be positive and statistically significant, which can be argued that members of the trade agreement intensify their trade after the trade Agreement came into effect, which means trade creation happens because of this agreement.

u<sub>ij</sub>: log-normally distributed error term, including other unexpected errors influencing trade. The disturbance term log (u<sub>ij</sub>) is assumed to be iid with zero mean E(log(u<sub>ij</sub>))=0 and a constant variance. [Abbas and Waheed \(2015\)](#) use the ratio between the forecasting and actual export values to estimate the trade potential. If the ratio >1, that means the actual

export performance is less than predicted, and if the ratio  $<1$ , that means the actual export is higher than the predicted value. If that ratio  $=1$ , the actual value equals the predicted one. If the ratio is higher than 1, [Abbas and Waheed \(2015\)](#), interpret that there is still room to enforce the trade. This study also applies this formula to evaluate the potential trade between Vietnam and US, Vietnam, and China:

We use OLS for time series data; from 1986 to 2015, the trade volume of export and import are counted separately between Vietnam-US and Vietnam-China. Time series help to evaluate the trade relationship with the two biggest major trade partners over time, including the impacts of political changes and trade agreement success. Data have been checked for outliers, and all estimates are checked against heteroscedasticity. It is important to note that heterogeneous problems do not create the matter because we focus only on two trade relationships. No problem occurs due to the different exports from two similar-income countries. The GDP growth rate and GDP per capita data were collected from World Bank. Data for export and import were collected from the General Statistics Office of Vietnam. GDP per capita is measured in current million USD dollars. The research is done through 2 methods: qualitative research methods and quantitative research methods. Research methodology for secondary information documents is done through research on internet documents, research essays, and related studies that have been completed before. To have the directions for the thesis and choose the appropriate model for the research. Secondary information quantitative research method: This study will use the method describing the statistical sampling research to have an overview of the research problem. Data processing through statistical Regression Excel software and SPSS uses statistical methods, analysis, comparison, and logical reasoning to synthesize data and data to determine the appropriate results.

## DATA ANALYSIS AND RESEARCH RESULT

With data collected from the IMF and the World Bank, I designed and analyzed the data with excel and statistical software. The gravity model result is below, with two kinds of analysis model 1 Pooled OLS and model 2 fixed effects 68 observations dependent variable  $\ln$  Trade the Regression. A commonly used linear model fit measure is the R square (R Square) coefficient of determination. The formula for calculating R squared comes from the idea that the entire observed variation of the dependent variable is divided into two parts: the part due to the Regression and the part due to the Residual. If the fraction of variation due to Residual is more minor, i.e., the smaller the distance from the observations to the regression estimator line, the higher the variance due to Regression will be, and the higher the R squared value will be. The R-squared coefficient is a function that does not decrease with the number of independent variables included in the model. The more independent variables we add to the equation, the more the R-squared index will increase. It is not always good to increase the R-squared value by adding more variables to the model because there can be many problems, such as multicollinearity, redundant variables, and complicated variables for analysis. As an indicator of model goodness of fit like R-squared, the meaning of R-squared is slightly different because the adjusted R-squared does not necessarily increase when we add more independent variables. Into the model. Therefore, the adjusted R-squared is more often used because this value more closely reflects the fit of the regression model. Two values of R squared (R Square) and R squared (Adjusted R Square) are in the Coefficients table in the results of linear regression analysis. R squared is always less than or equal to R squared. The adjusted R-squared ranges from 0 to 1, but achieving a value of 1 is impossible because residuals are always present in the model. Regarding the meaning of R-squared correction, as mentioned above. This index reflects the explanatory level of the independent variables to the dependent variable in the regression model.

In this study, the adjusted R-squared value was 0.697 model 1 and increased to 0.761. Thus, the independent variables explain 69.7% and the highest, 76.1%, of the variation of the dependent variable and significant value in statistic analysis. Out-of-model variables and random error explain the rest. There is no exact standard for how much R-squared is adjusted for the new model to meet the requirements. The closer this index is to 1, the more significant the model is. The closer to 0, the weaker the model's significance. Usually, we choose an intermediate level of 0.5 to divide into two branches of vital significance/weak significance. From 0.5 to 1, the model is good. Less than 0.5, the model is not good. However, this is only relevant in a few situations, requiring that  $R^2$  be more significant than 0.5 is against the statistical theory. Thus, if the regression results analyzed have R-squared adjusted below 50% (0.5), the results are still accepted.

**Table 1:** The correlation of variables in the model analyses

	Ln (TRAD E)	TRAD E	REM OT	SCAL E	Kap endow ment	Land endow ment	GDP distanc e	FTA dumm y	Exports (VN)	Impo rts (VN)
Ln (TRADE)	1									
	0.47053									
TRADE	25	1								
	0.26527	0.0320								
REMOT	65	6948	1							
			-							
	0.14199	0.3723	0.8637							
SCALE	970	9877	0521	1						
Kap_endo	-	-	0.5591	-	1					

wment	0.09422 511	0.2708 5487	9646	0.5980 0578					
Land_end owment	0.10816 086	0.3971 5096	0.6958 1164	0.7975 6787	0.72267 324	1			
GDP_dist ance	0.41050 675	0.1956 2420	0.9750 4738	0.7458 6117	0.45501 8894	0.58695 6506	1		
FTA_dum my	0.06629 628	0.0433 7484	0.1686 6130	0.1828 09802	0.05135 4698	0.28752 2703	0.14056 2299	1	
Exports (VN)	0.39350 848	0.9309 6815	0.1224 9941	0.5120 7683	0.19084 6078	0.37046 0764	0.02602 0478	0.0170 1370	1
Imports (VN)	0.47451 896	0.8905 0745	0.2184 1489	0.1255 2937	0.31760 1022	0.35276 1359	0.36872 7598	0.1101 4734	0.66292 48

It is presented the real relationship in theory and satisfies the model regression. In correlation, the minus value, as seen in the table above, is between Ln(trade), trade, and kap and land. That correct inversed correlation higher value in trade the less in land and kap (per capita per ratio) expressed as the efficient. The GDP distance and REMOT have the maximum correlation in this model with a 0.975 value, which can express the covariate correlation with strength value.

Compared to the previous study before 2015, this study collected data from 1986 to 2019. In 2019 the trade war between US Viet Nam and China Viet Nam analyzed bilateral trade likewise. In general, both export and import rose rapidly over the period. The actual data and the empirical results evidence it. GDP growth rate and GDP per capita positively impact bilateral trade, in which the difference in GDP per capita shows a more substantial influence at a significant level of 1 percent. The bilateral trade agreement contributes significantly to bilateral and trade far trade between VN and US and seems to push export more than import. Indicates the bilateral trade between China and Vietnam. The empirical results are a bit different compared with the result for the bilateral trade between Vietnam and US. The first un-similar result is the difference in GDP growth rate shows a positive and significant impact in the case of export, and there is no statistically significant impact in the case of import. However, the sign is expected positive sign.

The estimated coefficients of GDP per capita show similar results with that of the US and Vietnam when an increase in people's income will lead to exports and imports. Those results are like our expectations. This result is consistent with the Heckscher-Ohlin theory. However, the coefficients for import flow are a bit larger than that for export flow, unlike US's case. The data also agrees with this result when the import flows from China increase faster than the export flows to China. One significant difference between the two relationship lines is the empirical results of the variable ASEAN trade agreement. The estimated coefficients for both export and import are Negative and significant at 10% in case of export and 5% in case of import. That implies the trade diversion when China signed the trade agreement with 6 ASEAN countries. Then China expands its export and import market to other members rather than only Vietnam. Therefore, the trade agreement creates trade diversion, unlike in the US case. In general, the empirical results fit with the actual data. The estimates of GDPs and GDP per capita in the case of China Vietnam relationship further strengthen our conclusion that exports and imports significantly increase due to the economic expansion. A close look at the results between the two relationships reveals some differences, especially in the case of the trade agreement. This point can infer that the bilateral trade agreement between US and VN has yielded trade creation, whereas the ASEAN trade agreement with China results in trade diversion. One explanation for this may be that the US is highly interested in the agricultural products of Vietnam, and each country has its unique products. Specifically, the US has a comparative advantage in exporting its high-value-added products to Vietnam.

In contrast, Vietnam had a comparative advantage in producing agricultural and seafood products in the previous 2015, before especially 2019, the change in industrial machinery export in US and VietNam. Nevertheless, it is noteworthy that other ASEAN countries have much more familiar with production and consumption with Vietnam; therefore, China may redirect its trade transactions from Vietnam to other ASEAN countries. In 2019 the milestone trade war, the effect of China's export-import VietNam was less significant and negative than positive in the trade agreement.

## CONCLUSION

Vietnam's development over the past 30 years has been remarkable. Economic and political reforms under Đổi Mới, launched in 1986, have spurred rapid economic growth, transforming what was then one of the world's poorest nations into a lower middle-income country. Between 2002 and 2018, GDP per capita increased by 2.7 times, reaching over US\$2,700 in 2019, and more than 45 million people were lifted out of poverty. Poverty rates declined sharply from over 70 percent to below 6 percent (US\$3.2/day PPP). The vast majority of Vietnam's remaining poor – 86 percent –are ethnic minorities.

Given its deep integration with the global economy, the Vietnamese economy has been hit by the ongoing COVID-19 pandemic but has shown remarkable resilience. GDP grew by 2.9 percent in 2020. It was one of the few countries in the

world to do so. Still, the crisis also left a lasting impact on households, with 45 percent reporting lower household income in January 2021 than in January 2020. Vietnam's economy is set to grow 6.6 percent in 2021 due to successful control of COVID-19 infections, strong export-oriented manufacturing performance, and robust domestic demand recovery.

Vietnam is experiencing rapid demographic and social change. Its population reached 96.5 million in 2019 (up from about 60 million in 1986) and is expected to expand to 120 million by 2050. According to the 2019 Population Census Report, 55.5 percent of the population is under 35 years of age, with a life expectancy of 76 years, the highest among countries in the region at similar income levels. But the population is rapidly aging. And Vietnam's emerging middle class, currently accounting for 13 percent of the population, is expected to reach 26 percent by 2026.

The results lead to the following inferences. Firstly, the results for the GDP growth rate for VN-US trade relations are positive and significant for imports, while for CN-VN, the variable is positive. And significantly in the case of exports. Therefore, economic growth becomes one of the variables in explaining trade flow trends. In addition, this result is consistent with the actual data because the rate of exports to the United States increased faster than the rate of imports from the United States, in contrast to the rate of imports from China growing at a higher rate than exports to China.

Secondly, it is interesting that the GDP per capita coefficient is positive and significant at a 1% level in the US-VN trade relationship and VN-CN trade relationship. The magnitude of the export coefficient is higher than the import coefficient in the case of Vietnam-US trade, and the opposite result is found in the case of the VN-CN trade. Therefore, there is solid statistical support for this. According to the Heckscher-Ohlin theory, the difference in income levels between two countries pushes trade. This finding is similar to [Batra \(2006\)](#), [Nguyen \(2010\)](#), [Xuegang \(2008\)](#) [Lien \(2015\)](#). Finally, the estimated coefficients of the trade agreement between the two trading relationships have opposite results. While the bilateral trade agreement between the United States and Vietnam strengthens the bilateral trade, the formation of the ASEAN trade agreement with China has weakened bilateral trade between China and Vietnam. It is a remarkable fact that the United States has different comparative advantages in production and consumption from Vietnam.

In contrast, Vietnam has advantages in production and consumption over other ASEAN countries. As a result, US trade partners like to trade with Vietnam, and China moves its trade location to another ASEAN Nation. Therefore, Vietnam should seek more export items destinations to promote export flows further to reduce dependence on the Chinese market. Also, we need to look for other regional and world import markets to reduce dependence on imports from China.

This paper has studied the determinants of trade flows between VN-US and VN-CN to provide a detailed comparison. The input and output stream models are derived in a gravity frame. The results are consistent with the actual data and yield significant results. The result suggests that GDP growth between the two countries will boost import and export flows. Besides, It seems reasonable to conclude that GDP per capita strongly impacts trade flows, showing that income level is essential to explain trade flows, which proves Heckscher-Ohlin's approach to trade. Perhaps the study's most important finding is that U.S.-Vietnam Bilateral Trade Agreement Creates Trade While the ASEAN Trade deal with China creates a trade diversion. This finding is inconsistent with some research but reinforces [Nguyen's \(2010\)](#) finding when he finds trade diversion between AFTA member countries and the EU. These results suggest important trade policies for Vietnam to diversify its export and import destinations. The context of the trade agreement and trade war 2019 can be explained by data analyzing the relationship coefficient model index. The correlation as founded Vietnam has a benefit in the trade war between China and the US, to prove the diplomatic relations related to economic development, namely import and export that is the meaning of this research.

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