Determinants of Service Export in ASEAN Member Countries

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Abstract. ASEAN economy has undergone a shift, as has the structure of the global economy. The shift in the economy that occurred was from the main share of the agricultural sector to the industrial sector and the service sector. From year to year, the ASEAN service sector continues to experience positive growth with an increasing contribution beyond that of other sectors. ASEAN's service exports grew higher than ASEAN's goods exports. There are still several ASEAN member countries that experience a trade deficit in services, which is interesting to investigate further. This study aims to analyze the performance of service exports in 10 ASEAN member countries from 2010 to 2019. The results of panel data regression using the WLS fixed effect model show that foreign direct investment, nominal exchange rate, gross domestic product, services value added, gross domestic product, labor force, human capital and communication facilities have a significant effect on ASEAN's service export. The development of communication technology, development of human resources and updating of important policies are considered by the government to improve the performance of service exports of ASEAN member countries.

1. Introduction

The global economy has now undergone a change in terms of the dominating sector triggered by progress in various fields. The Association of Southeast Asia Nations (ASEAN) has an economic growth that is always positive with an average of 5.16 percent from 2000 to 2019. As the structure of the global economy has changed, the ASEAN economy has also experienced a shift. There has been a shift from the main share of the agricultural sector to the industrial sector and the service sector. Based on data from the ASEAN Secretariat, the service sector has the largest contribution to the economy in nine out of ten ASEAN member countries in 2019. The service sector contributes more than 60 percent to the three ASEAN member countries, namely Thailand, Singapore and the Philippines. The industrial sector occupies the second position in the economy of the majority of ASEAN member countries besides Brunei Darussalam. The agricultural sector has the smallest role among the three economic sectors in ASEAN and in particular does not contribute at all in Singapore. It can be said that there is a transformation from the dominance of the agricultural sector to the service sector.

International trade can be used as a driving force for a country's economy, where international trade is divided into two categories, namely international trade in goods and international trade in services. ASEAN international trade in services has more potential to accelerate ASEAN economic growth, considering that the service industry is also the fastest growing sector in ASEAN, so that it can become the foundation of the ASEAN economy. However, since 2017 there has been a downward trend in total economic growth, so a study related to trade in services in ASEAN is needed.

Service exports have increased rapidly compared to other sector exports in developed and developing countries [2]. Service export growth in developing countries has increased in general since 2011 in most service sectors. It is known that developing countries are subject to a deficit in the services account while experiencing a surplus in the goods account. As is known, the majority of ASEAN member countries are developing countries that have not taken a large part in supplying services in the international service market. This prompted this research to be carried out. There are still several ASEAN member countries that experience a trade deficit in services, which is interesting to investigate further.
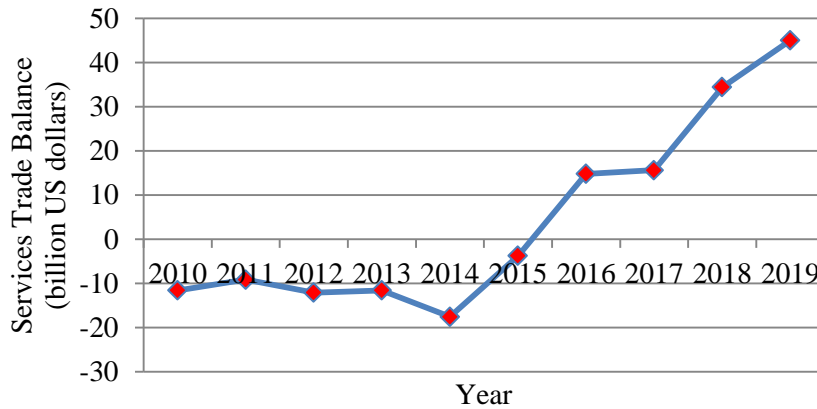

Figure 1. Services trade balance in ASEAN (billion US dollars)
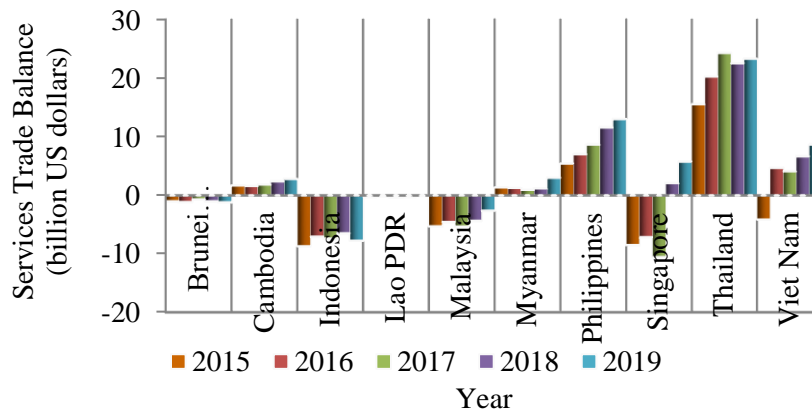Source : ASEAN Secretariat, processed by author

Figure 2. Services trade balance by ASEAN member countries
(billion US dollars)
Source : ASEAN Secretariat, processed by author

The potential possessed by international trade in ASEAN services, especially service exports, is quite convincing. However, there is the problem of the international trade in services deficit that has occurred for years up to 2015. Trade balance deficit occurred due to the limited ability of most developing countries to supply service needs in the global market [2]. The high import of services has caused ASEAN, which is dominated by developing countries, to become an association of service importers. This condition is in line with what was disclosed by research [3], that exporters tend to be based in large economies and high-income countries. Based on Figure 1, the ASEAN services trade balance experienced a deficit in the services trade balance in 2010 to 2015. In the following year, 2016

was continued until 2019, the ASEAN services trade balance had a surplus. In other words, there is a better condition in the ASEAN services trade balance.

However, if we look more closely at the conditions of trade in services according to ASEAN member countries, we find interesting things to investigate further. The problem found is the uneven condition of the service trade balance according to ASEAN member countries as can be seen in Figure 2. There are 4 countries that have not experienced surplus of intertional trade in services in 2015-2019. Therefore, researchers are interested in conducting research related to the determinants of ASEAN services exports in 2010-2019 with panel data regression analysis method. The 2010-2019 period already includes a deficit in ASEAN services trade in 2010-2015 and then becomes a total ASEAN services trade surplus in 2016-2019. The results of the study are expected to have important implications for policies related to service exports for ASEAN member countries, especially member countries categorized as developing countries to not only become consumers of services from other countries but also become service producers for other countries.

2. Literature Review

In general, a country conducts trade with the aim of seeking profit from the trade carried out. Each country has different advantages in producing goods and services. Therefore, it will be more profitable if each country specializes in its advantages. Services are one of the outputs that can be interpreted as intangible products and tend to be traded as intermediate products rather than final demand. According to the [4], the term service includes a variety of intangible and heterogeneous products and activities that are difficult to pack in a simple definition.

Services sector is classified into 12 components in the Extended Balance of Payment (EBOPS), namely manufacturing services for physical inputs owned by other parties; Maintenance and repair services; Transportation services; Travel services; Construction services; Insurance and pension services; Financial services; Costs for the use of intellectual property; Telecommunications, computer and information services; Other business services; Personal, cultural and recreational services; Government services [4]. Trade in services differs from trade in goods in two ways. First, trade in services involves the movement of goods from one country to another, but in trade in services, cross-border trade is not the most important in conducting international transactions. Second, services tend to be strictly regulated and many types of services are provided or produced by regulated monopolies. Barriers to trade in services increase from domestic regulations that often provide two purposes in responding to market failures and protecting local suppliers from foreign competition [5].

The General Agreement on Trade in Services (GATS) governs the terms of trade in services in the world. There are four methods established in the GATS to analyze trade in services, namely cross border supply, overseas consumption, commercial presence and supplier migration [3].

1. Mode I is cross-border supply which is the closest analogy to trade in goods, where service providers living in one country provide services in another country without anyone physically moving between countries.
2. Mode II is consumption abroad, ie when consumers in a country have to move to a service provider country.
3. Mode III is a commercial presence, i.e. when a company relocates to a consumer country to sell services locally through the establishment of foreign affiliates or branches.
4. Mode IV is provider switching, which is when a service provider temporarily moves to a consumer country to provide services.

Service exports are services provided by residents in a country to companies, households or companies from other countries [1]. Strengthening the competitiveness of the service sector and strengthening the relationship between the state and the global economy is very important for economic development. Exports result in higher production efficiency and increased availability of foreign capital and technology [6], and these benefits can spread throughout the economy as services are important inputs for production in other sectors [23]. As a result, the new conventional wisdom recognizes that services can be the main driver of future economic growth [7].

In research [8], the impact of the internet on service export performance in 150 countries is studied. This study aims to examine the effect of internet technology on the performance of service exports in

several countries. The development of the internet in the 1990s which had a major impact on globalization in the world became the background for this research. To achieve the research objectives, there are several variables used, namely trade in services as the dependent variable and internet users, gross domestic product, population and financial depth as independent variables. The data used is panel data for the period 1990 to 2006 with panel data regression model. This study proves that an increase in the number of internet users per 100 people has a significant impact on increasing trade in services which include exports and imports using pooled OLS regression, fixed-effect models and GMM panels. The Internet as part of a communication facility has a positive influence on service exports.

Using the gravity model, research [9] examines the factors that affect service exports in the United States with trading partner countries from Asia in 2011. For 9 years from 2000 to 2008, with 6 countries trading with America United States, conducted research using four independent variables. The independent variables in the study conducted by Kaur are gross domestic product, economic openness, equality with a value of 0 and 0.5, and the corruption index of service importing countries has been proven to have a significant positive effect on the United States' service exports to Asian countries [9].

The flow of trade in services between Vietnam and European countries was investigated in [10]. A study related to trade in services was conducted to find out what are the determinants of trade in services between Vietnam and the member countries of the European Union. This study uses the gravity model because the trade under study is bilateral trade using panel data regression analysis method random effects model. In this study, it is known that GDP per capita, population in exporting and importing countries, real exchange rates, CMEA membership and colonial linkages have a positive effect on trade in services.

The gravity model approach as a tool for deeper analysis of bilateral trade flows has been carried out by several studies, including one conducted by [11]. In examining the factors that affect Lithuania's service exports, the variables of GDP, distance, time zone differences, contiguity, language similarity, trade agreements, institutions, human capital and remoteness are used. In this study, it does not only examine service exports in the aggregate but also examines the determinants of each service subsector. Based on the results of this study, there is limited value in analyzing trade flows in the aggregate. Different types of services have different roles in the global economy characterized by different market structures and have different modes of supply. Thus, it is necessary to consider sector-specific analysis in terms of characteristics.

Human capital of countries in South Asia because these countries have experienced trade deficits for the past few decades and looks for strategies to overcome the problem [12], this study is formulated with the aim of investigating whether human resource development is associated with export performance. In these countries because the external sector requires a highly skilled workforce to implement strategies such as diversifying products, markets and resources and moreover, minimizing production and transportation costs, developing trade networks and communication skills, etc. It is found that under the fixed effects model, human capital significantly influences exports in South Asian countries.

[2] conducted a study to determine the determinants of service exports in selected developing countries in Asia from 1985 to 2012 against 13 selected developing countries in Asia. This analysis uses the panel method with the GLS Random Effect model involving five independent variables, namely real exchange rates, world real GDP, foreign direct investment, communication facilities represented by the number of fixed telephone users and value added services. This study found that all independent variables affect the export of services. It is important to be able to take advantage of everything that can increase production in the service sector. In addition to the real exchange rate variable, all independent variables have a positive influence on the service exports of selected Asian countries. As a conclusion from the research results [2], developing countries in Asia have the opportunity to compete in exporting services globally, as long as they can take advantage of their potential and increase their competitiveness in exporting services to international markets.

Selected developing countries in Africa using data from the World Development Indicators and the United Nations Conference on Trade and Development (UNCTAD) in analyzing service exports in

selected West African countries in the period 1999 to 2012 [1]. The results of the study show the value of Added services did not have any impact on service exports in the selected countries. However, the variables of foreign direct investment, real exchange rate, communication facilities, real exchange rate, and gross domestic product were found to have a significant impact on trade in services exports.

[13] measured the influence of ICT on the services trade of world countries and found that the dimensions of ICT with the variables of broadband subscriptions, internet users, fixed telephone subscriptions and cellular telephones had a positive effect on the value of services trade. An increase in population and gross domestic product will increase the value of trade in services. Meanwhile, geographical distance reduces the value of trade in services.

Based on previous researches, it is believed that the service exports is determined by variables that measure the income, production, technology and human resources of a country. Therefore, the researcher would like to further examine the effect of foreign direct investment, exchange rate, gross domestic product, services value added, human capital, labor force and communication facilities on service exports with the ASEAN member countries research area. This study uses a panel data regression model in analyzing the variables that affect the performance of service exports in ASEAN for the 2010 to 2019 period.

3. Data and Methodology

3.1. Data Sources

This study uses secondary data consisting of individuals in the form of 10 ASEAN member countries, namely Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam with a research period from 2010-2019. Data sourced from the World Bank, UNDP and ASEAN Secretariat websites. The variables used are service sector and sub-sector exports, foreign direct investment, nominal exchange rate, services value added, gross domestic product, human capital, labor force and communication facilities.

Table 1. Summary of Data Sources and Units

Variable	Source	Unit
Services sector export (SEXP)	ASEAN Secretariat	Billion US dollars
Foreign direct investment (FDI)	World Bank	Billion US dollars
Nominal Exchange rate (NER)	World Bank	Per US dollar
Services value added (SVAD)	World Bank	%
Gross domestic product (GDP)	World Bank	Billion US dollars
Human capital (HCAP)	UNDP	Year
Labor force (LABF)	World Bank	%
Communication facilities (COMF)	ASEAN Secretariat	Per 100 persons

3.2. Justification and Description of Variables

3.2.1. Service Export. Service exports are the total value of service sector exports received by a country in a certain period. The value of service exports in this study is the nominal value of service exports in units of billions of US dollars.

3.2.2. Foreign Direct Investment. Foreign direct investment (FDI) in services can promote productivity and efficiency for the same reasons trade in goods and FDI [14]. Foreign direct investment has a positive effect on service exports [1] [2]. Foreign direct investment (FDI) used in this study is the value of direct investment inflows made by non-resident investors in the reporting economy with the type of foreign direct investment net inflows. In this study, foreign direct investment has units in billion US dollars. Foreign direct investment is expected to have the influence on service exports.

3.2.3. Nominal Exchange Rate. Nominal exchange rate is the relative price of the currencies of two countries. The fall in relative domestic prices related to the depreciation of the exchange rate indicates cheaper prices for goods and services exported in international markets which in turn increases the demand for service exports [15]. An increase in the exchange rate will make goods and services in the home country much cheaper compared to foreign counterparts, and thus encourage exports and reduce imports of that country [10]. In this study, the nominal exchange rate in the average period is used for the value of the domestic currency of ASEAN member countries against 1 US dollar. Nominal exchange rate is expected to have the influence on service exports.

3.2.4. Services Value Added. Services value added is the net output after adding up all the output of services then reduced by the cost of producing services. Value added is a net output calculated without reducing the depreciation of fabricated assets or the depletion and degradation of natural resources [16]. The value added services used in this study have a percentage unit of gross domestic product. Services value added is expected to have the influence on service exports.

3.2.5. Gross Domestic Product. Gross domestic product is the market value of all final goods and services produced in a country in a certain period [17]. Several studies have found that gross domestic product has an influence on service exports. [10] use GDP per capita and find that GDP per capita affects service exports positively. Real gross domestic product is also widely used in research and it is found that GDP has a positive influence on service exports [8][11][13]. The GDP used in this study is a constant GDP with a base year 2010 (real GDP) in billions US dollars. Gross domestic product is expected to have the influence on service exports.

3.2.6. Human Capital. Education is the main element in human capital to maximize the efficiency of the use of labor. Increasing investment in education and skills training is a key step towards achieving an increase in the human capital base in a region [18]. In exporting services themselves, it is important to have good human capital to maximize service sector performance and encourage service exports. Other research states that human capital has a positive influence on both service exports and exports [11][12]. The average length of schooling represents human capital. The average length of schooling is defined as the average length of time a population over the age of 25 has attended education. The unit of human capital represented by the average length of schooling is years. Human capital is expected to have the influence on service exports.

3.2.7. Labor Force. If the number of workers involved in the company increases, the total production will increase [19]. The population and the productive age population are widely used as variables that indicate a measure of the availability of labor, especially in the service sector and are stated to have a positive influence on service exports [8][10][13]. The labor force is represented by the labor force participation rate. The labor force participation rate is the percentage of the population aged 15 years and over who are in the labor force. The labor force participation rate has units of percent. Labor force is expected to have the influence on service exports.

3.2.8. Communication Facilities. The development of the internet, ICT facilities and others makes the provision of services to the average consumer more possible [1]. [13] state that the dimensions of information and communication have a positive influence on trade in services. ICTs have a large spillover effect on services and serve as a catalyst in converting non-tradable services into tradable

services [14]. Communication facilities are important as one of the determinants of service exports that have a positive effect on service exports [1][2]. Communication facilities in the form of the internet have an important and positive influence on the global economy, especially trade in services [8]. [13] use four dimensions of information and communication technology, namely the number of fixed telephone subscriptions, mobile phone subscriptions, broadband, and internet users. Of the four dimensions, the number of mobile phone subscriptions is the most consistent dimension. Communication facilities in this study are represented by access to cellular telephones per 100 inhabitants. This indicator includes the number of postpaid subscriptions and the number of active prepaid accounts (ie those that have been used for the last three months). Communication facilities is expected to have the influence on service exports.

3.3. Theoretical and Empirical Model

In panel data regression, there are three types of estimation models that can be used, namely the common effect model (CEM), fixed effect model (FEM) and random effect model (REM). In choosing the best model, several tests were carried out. The model testing carried out is a test of the significance of the fixed effect model using the Chow test to choose between CEM and FEM, the Hausman test which is used to choose between FEM and REM, and the Lagrange Multiplier test which is used to select CEM and REM [20][21]. If FEM is the best model, it is necessary to test the residual variance-covariance structure using the LM and λ_{LM} test.

After obtaining the best model, it is necessary to test the classical assumptions. The best model that meets the classical assumptions is then measured and tested for the significance of the model using the coefficient of determination, F-statistics (simultaneous) and t-statistics (partial). Two-way test is used to analyze the model partially.

The panel data regression model that will be formed is as follows,

$$\text{LnSEXP}_{it} = \propto + \beta_1 \text{FDI}_{it} + \beta_2 \text{LnNER}_{it} + \beta_3 \text{SVAD}_{it} + \beta_4 \text{LnGDP}_{it} + \beta_5 \text{HCAP}_{it} \quad (1)$$
$$+ \beta_6 \text{LABF}_{it} + \beta_7 \text{LnCOMF}_{it} + u_{it}$$

Due to the difference in units, a natural logarithm transformation is carried out on several variables. However, the variables with units of percent and year are not transformed. The FDI variable is not transformed because it is net inflows, namely the difference between investment inflows and outflows. Service exports with transformed values are thought to be affected by foreign direct investment (FDI), foreign exchange rate (FER), services value added (SVAD), gross domestic product (GDP), human capital (HCAP), labor force (LABF) and communication facilities (COMF). Notation i represents ASEAN member countries and t represents the year of research. u_{it} is the error term which consists of individual effects that are unobservable and remainder disturbance.

4. Results

4.1. Overview of Service Export from 10 ASEAN Member Countries

The General Agreement on Trade in Services (GATS) governs how services are traded in the world. Trade in services differs from trade in goods in that it does not require the movement of products between countries. Therefore, the service trade approach is not simple. Trade in services is carried out to improve the economy of each country, both in meeting domestic service needs and to earn income from service trade. ASEAN member countries export services. Service exports are defined as services provided by residents in a country to companies, households or companies from other countries [1].
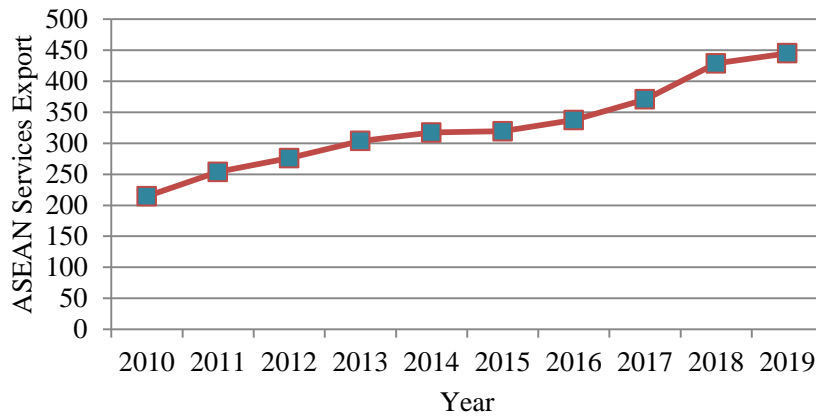
Figure 3. ASEAN service exports for the period 2010-2019 (billion US dollars)
Source: ASEAN Secretariat, processed by author

ASEAN's service exports in aggregate from 2010 to 2019 tend to increase. In 2019, the value of service exports amounted to US$444.78 billion, more than double the value of service exports in 2010 which amounted to US$214.5 billion. There has been a more than doubled value of services exports over a ten year period. According to research [7], the quality of service exports is positively associated with economic growth performance. It can be said that the growth of service exports that continues to increase in ASEAN then indicates an improving growth in per capita income so that the welfare of the people of a country is getting better.
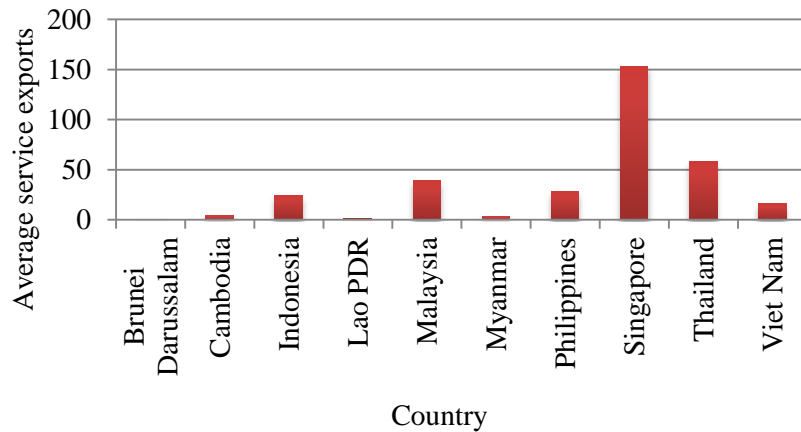

Figure 4. Average service exports by ASEAN member countries for the period 2010-2019 (billion US dollars)
Source: ASEAN Secretariat, processed by author

If the service export value data is presented by ASEAN member countries as shown in Figure 4, a clearer picture of the service exports of each ASEAN member country is obtained. It is known that Singapore dominates service exports among other ASEAN countries. Singapore is known to be a developed country in ASEAN, so it is quite clear that Singapore has a much higher value of service exports [2]. Singapore exports services many times more than other ASEAN member countries. The second highest ASEAN service export rank belongs to Thailand with a service export value that is too far from Singapore. The presence of developing countries in the global market as service providers is generally limited, where the export of services in international markets or their control is mostly

supplied by developed countries [1]. This can be seen from how Singapore's service exports outperform other ASEAN countries' service exports.

In the Extended Balance of Payments (EBOPS), the services sector is classified into 12 services sub-sectors. Based on Figure 5, among all exports of other services sub-sectors, the average export of travel services occupies the highest position in ASEAN and is followed by other business services. ASEAN countries are known as popular regions with tourist destinations. In other words, the focus of ASEAN's service activities is in exporting travel services. Meanwhile, the average transportation service occupies the top third position. These three subsectors can be said to dominate ASEAN because they have an average value with a significant difference in value compared to other services subsectors. Thailand is the country with the highest average export of travel services at 40.58 billion US dollars. Singapore is the country with the highest average other business services export of 37.2 billion US dollars and the highest average transport services of 47.6 billion US dollars. Personal, cultural, and recreational services, government services and construction services respectively have the lowest average exports of services. The average construction services is in the third lowest position with an average value of 3.5 billion US dollars, although this subsector of services is very much needed related to development in ASEAN.
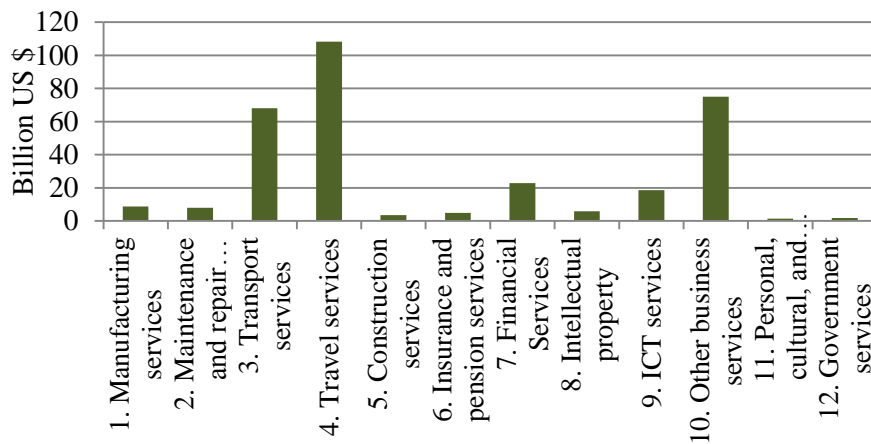

Figure 5. Average exports of the services subsector of ASEAN member countries during 2010-2019 (billion US dollars)
Source: ASEAN *Secretariat*, processed by author

4.2. Empirical Results on Services Export in ASEAN

The selection of the best regression model is needed to be able to identify and analyze the variables that affect service exports. There are three models in panel data regression, namely the common effect model, fixed effect model and random effect model.

Table 2. Chow and Hausman test results

Test	Model Comparison	Statistic	d.f.	Prob.	Results
Chow	CEM vs FEM	76.60	(9,83)	0.0000	FEM
Hausman	FEM vs REM	43.15	7	0.0001	FEM

The chow test performed resulted in a p-value of 0.000 which had a value of less than 5%. The decision of this test is to reject H_0 which means that the selected model is FEM. Furthermore, through the Hausman test, the p-value is less than 5% with the decision to reject H_0. Thus, the best model based on the results of the Chow test and Hausman test is the fixed effect model.

The next test is to determine the best estimation method by looking at the presence or absence of heterogeneity in the residual covariance structure and cross-sectional correlation. The results of the Lagrange Multiplier (LM) test produce an LM of 49.010 which is greater than the value of

$\chi^2_{(0.05;9)}$ which is 16.92, so it is concluded that there is heteroscedasticity in the residual covariance-variance structure of the fixed effect model. Because there is heteroscedasticity, followed by the Lambda Lagrange Multiplier test, so that it is found that λ_{LM} is 55.29 smaller than $\chi^2_{(0.05;45)}$ which is 61.66. It can be concluded that there is heteroscedasticity and there is no cross-sectional correlation, so the best estimation method is using the WLS (Weighted Least Square) method with cross section weight.

With the selection of the WLS (Weighted Least Square) estimation method with cross section weight, the classical assumption test that needs to be done is the normality and non-multicollinearity test. The results of the normality test using the Jarque-Bera test, obtained the Jarque-Bera statistic of 1.56 (p-value = 0.45>0.05), it can be concluded that the assumption of normality is met. The results of the non-multicollinearity test can be seen from the correlation value in the correlation matrix, where the results show that there is no correlation that is worth more than 0.8, so that the non-multicollinearity assumption is fulfilled.

Test the significance of the model using the coefficient of determination, the size of adjusted R^2. The adjusted R^2 value of the selected FEM-WLS model is 0.9981. The variation of the service export variable that can be explained by the selected independent variable is 99.81%. Simultaneous test is used to see simultaneously whether the existing independent variables affect the service export variable. The calculated statistical value in the F test is 3236.349 (p-value of 0.0000), so it can be concluded that there is at least one independent variable that affects ASEAN service exports. Partially, using the t statistic test, the results show that 5 of the 7 independent variables have a significant positive effect on the dependent variable of service exports. Five of the seven significant variables that have a positive effect on ASEAN's service exports, namely the variables of foreign direct investment, value added services, gross domestic product, human capital and communication facilities. A summary of the estimation results using the fixed effect model with the WLS method is in Table 3. The results obtained from the fixed effect model with the WLS method are in the following table.

Table 3. The results of the fixed effect model with the WLS estimation method

Variable	Coefficient	t-statistic
C	-1.4505	-1.8323
FDI	0.0043	5.1745*
LnNER	-0.7074	-5.8925*
SVAD	0.0123	2.5807*
LnGDP	0.9887	9.3023*
HCAP	0.3065	3.6373*
LABF	-0.0241	-3.2131*
LnCOMF	0.3551	7.8484*
R-squared		0.9984
Adj R-squared		0.9981
Prob (F-stat)		0.000

Note: * significant at a significance level of 5%

The resulting equation is as follows.

$$\text{Ln}(\widehat{SEXP_{it}}) = (-1.450 + \hat{\mu}_i) + 0.0043FDI_{it}^* - 0.7074LnNER_{it}^*$$
$$+ 0.0123SVAD_{it}^* + 0.9887LnGDP_{it}^* + 0.3065HCAP_{it}^*$$
$$- 0.0241LABF_{it}^* + 0.3551LnCOMF_{it}^* \qquad (2)$$

Based on the partial t-test, foreign direct investment has a significant effect on service exports, with a regression coefficient of 0.0043. An increase of 1 billion US dollars in foreign direct investment of an ASEAN member country will significantly increase 0.43 percent of service exports when other variables are constant. This is in line with what is expected that foreign direct investment will encourage service exports [1][2]. According to [24], FDI can be regarded as a valuable source of

technology and skills in the long term. Therefore, foreign direct investment is seen as one of the effective ways to increase service exports because it has a significant influence on ASEAN's service exports. Foreign direct investment means money from abroad enters as capital in the economy and creates more jobs. FDI plays a role in fulfilling the source of funds for the production of services. Every effort to increase foreign investment in Indonesia needs to be done to support investment in a country.

The nominal exchange rate has significant effect, but not a positive effect on service exports. The model estimation results on the exchange rate variable show that the depreciation of the currency exchange rate of an ASEAN country or an increase in the domestic currency rate per US dollar will reduce service exports. There are several studies with a negative effect on the exchange rate, namely the research [1][2]. Depreciation of the exchange rate causes the price of domestic service products to be relatively cheaper for other countries, so it is suspected that service producers in that country are not interested in exporting services at low prices. In addition, it is suspected that the exchange rate does not have positive effect on service exports due to political and security conditions in ASEAN member countries. For example, travel services, which are the sub-sector with the highest exports, are highly dependent on security conditions in a country. Even if the exchange rate depreciates, if conditions in a country are dangerous, such as demonstrations, coups and terrorism, it will be of little interest to travel service consumers. In this way, service exports will decline.

Services value added have a significant effect on service exports with a regression coefficient of 0.0123. The value added of services shows the size of service production in a country. Based on the results of the partial t-test, services value added will significantly increase by 1.2 percent of service exports if the value added of services increases by 1 percent while the other variables are constant (ceteris paribus). Thus, it can be said that the increasing production of services in a country will encourage service exports to increase. The direction of the influence of this variable is as expected [1][2]. Various efforts are needed to increase the added value of each country's services. That way, there will be an increase in service exports in ASEAN member countries.

Gross domestic product has a significant effect on service exports with a regression coefficient of 0.9887. Gross domestic product shows the condition of a country's economic ability to produce. Based on the results of the partial t test, gross domestic product has a significant positive effect on service exports. According to the estimation results obtained, service exports will increase by 0.99 percent if gross domestic product increases by 1 percent while other variables are constant. An increase in the wealth of a country tends to allow domestic service producers to develop their service products. That way, the service products of a country with a high gross domestic product will have good quality and can compete in the international service market. These results are in accordance with the research hypothesis and in accordance with researches [8][10][11][13].

According to the estimation results, the service export model is significantly influenced by human capital with a human capital regression coefficient of 0.3065. While other variables are constant, if human capital in the form of average length of schooling increases by 1 year, then exports of services will increase by 31 percent. Human capital shows how the educational conditions of human resources exist in a country. With the increasing human capital, in this case the education obtained is getting better, then the quality of human resources is getting better. Improving the quality of human resources in particular can increase the export of services. The results of this study are in accordance with the results of research [11][12].

The labor force shows the availability of labor in a country. The labor force was found to have significant but not a positive effect on ASEAN service exports. The increasing labor force in the case of ASEAN is not for exporting services but rather for consuming services both from within the country and abroad so that the large number of labor forces can not significantly increase service exports in ASEAN. This is allegedly caused by the quality of human resources in ASEAN member countries in terms of skills and expertise that are not yet qualified and in accordance with the needs in producing services. Zarzosa and Lehmann in [10] that a population that shows the availability of labor can have a negative influence on service exports when it is not accompanied by labor skills.

The regression coefficient of the communication facility variable is 0.3551. The results of the research related to the communication facility variable indicate that the communication facility has an

effect on service exports. An increase of 1 percent in cellular phone access per 100 population significantly increases service exports by 0.36 percent with the assumption of ceteris paribus. The results of this study are in accordance with [8]. Access to cell phones per 100 inhabitants is an approach to measuring the development of communication technology [13]. With the development of communication facilities, the production of services will increase, especially services that are closely related to technology such as telecommunications, information and computer services. Development of information and communication technology will increase intangible cross-border service products [3]. The existence of sophisticated communication technology will greatly facilitate service transactions between economic actors. Therefore, the existence of access for cellular telephones needs to be further expanded to increase sales of service products in the international market. The use of communication technology is important for ASEAN countries to consider as an effort to encourage service exports in ASEAN with a positive relationship between communication facilities and ASEAN service exports.

5. Conclusions

Trade in goods and services in the aggregate still dominates research topics in broad terms related to trade compared to trade in services. With the development of the service sector internationally, there are still not many studies that examine issues related to trade in services or export services in particular. Much of the research on the service sector itself has focused on the determinants of growth in the service sector. Thus, research to focus more on service exports needs to be carried out, especially to examine more deeply the condition of service exports in the region of ASEAN member countries. In this study, the determinants of service exports in ten ASEAN member countries was conducted during 2010 to 2019 using panel data regression. The estimation method used is the fixed effect model weighted least square (WLS). In general, service exports of ASEAN member countries continue to increase every year. ASEAN's service exports in 2019 were worth twice as much as service exports in 2010. Singapore is the country that dominates ASEAN's service exports. Travel services, other business services and transport services are the three service subsectors that dominate in ASEAN. Foreign direct investment, nominal exchange rate, gross domestic product, value added services, gross domestic product, labor force, human capital and communication facilities have a significant effect on ASEAN's service export. The nominal exchange rate and labor force have negative effect on ASEAN's service exports, while the rest of variables have positive effect on ASEAN's service exports.

There are several policies that can be suggested based on the results of this study. First, the construction of communication facilities is very important to do regarding the development of technology globally. One of them is by providing funds to conduct research on technology development. The use of communication technology is important for ASEAN countries to consider as an effort to encourage service exports in ASEAN with a positive relationship between communication facilities and ASEAN service exports. In addition, the infrastructure owned by each country needs to be optimized to attract foreign investment to each of these countries. Second, it is important to maintain the stability of the exchange rate against the dollar through fiscal and monetary policies. Third, the quality of human resources in developing countries needs to be improved by providing education with quality standards so that they can have skills, especially in the field of information and communication technology (ICT).

References

[1]   Abasimi I, Vorlak L, Salim A, and Li X 2019 Determinants of Export Service in Selected West African Countries *Int. J. Appl. Econ. Financ. Acc* **5** 39–47

[2]   Ahmad S A, Kaliappan S R and Ismail N W 2017 Determinants of service export in selected developing Asian countries *Int. J. Bus. Soc* **18** 113–132

[3]   Francois J, and Hoekman, B 2009 Services trade and policy. Journal of Economic Literature *J. Econ. Lit.* **48** 642–692

[4]   World Trade Organization 2010 *Measuring Trade In Services*

[5]   Copeland and Mattoo A. 2008 *A Handbook of International Trade in Services* Ed Mattoo A, Stern R M and Zanini G (New York : Oxford University Press)

[6]   Priyankara E A C 2018 Services Exports and Economic Growth in Sri Lanka : Does the Export-Led Growth Hypothesis Hold for Services Exports ? *J. Serv. Sci. Man.* **11** 479–495

[7]   Mishra S, Lundström S and Anand R 2011 Service Export Sophistication and Economic Growth. World Bank Policy Research Working Paper **5606**

[8]   Choi C 2010 The effect of the Internet on service trade *Econ. L.* **109** 102–4

[9]   Kaur S 2011 Determinants of Export Services of USA with its Asian Partners : A Panel Data Analysis *Eurasian J. Bus. Econ.* **4** 101–117

[10]   Nho P V and Huong V T 2014 Analyzing the Determinants of Services Trade Flow between Vietnam and European Union: Gravity Model Approach *MPRA Paper* **63982** 1–25

[11]   Covaci G and Moldovan S 2015 Determinants of service exports of Lithuania: a gravity model approach *Riga* **1** 21-45

[12]   Bhavan T 2017 Human Capital as a Pushing Factor of Export: The Case of Four South Asian Economies *Asian Development Policy Review* **5** 299–306.

[13]   Luong T A and Nguyen T H 2020 *The impact of ict on service trade* Singapore Economic Review p 1-22

[14]   Noland M, Park D and Estrada G B 2013 Developing the Service Sector as Engine of Growth for Asia: An Overview. *SSRN Electronic Journal* 12-18

[15]   Auboin M and Ruta M 2011 The relationship between exchange rates and International Trade: A review of economic literature *Staff Working Paper ERSD* **17**

[16]   Majeed M T and Ahmad E 2006 Determinants of Exports in Developing Countries. 45(Winter), 1265–1276

[17]   Mankiw N G 2012 *Macroeconomics* (New York : Worth Publishers)

[18]   Baah-boateng W 2013 Human Capital Development : the Case of Education As a Vehicle for Africa *L. J. Int. Aff Dip* LEJIAD **7** 31-55

[19]   Borjas G J 2013 *Labor Economics* (New York : McGraw Hill)

[20]   Baltagi, B. H. (2005). Econometric Analysis of Panel Data (3rd ed). Inggris : John Wiley & Sons Ltd

[21]   Greene W H 2012 *Econometric analysis* (New Jersey : Pearson Education)

[22]   Gujarati D and Porter D C 2009 *Basic Econometrics. In Introductory Econometrics: A Practical Approach* (New York : The McGraw-Hill)

[23]   Hoekman B and Mattoo A 2012 Services trade and growth *Int. J. Serv. Technol.* **17** 232–250

[24]   Gray M 2002 Foreign direct investment and recovery in Indonesia: Recent events and their impact *IPA Backgrounder* **14**