



## The Role of Information and Communication Technology on Service Trade: Case Study of Indonesia's Export to Asean Countries

Dyah Titis Kusuma Wardani<sup>1\*</sup>, Faiza Husnayeni Nahar<sup>2</sup>, Hairunnas<sup>3</sup>

<sup>1,2,3</sup> Universitas Muhammadiyah Yogyakarta

### Informasi Artikel

Sejarah artikel:

Diterima Agustus 2019

Disetujui September 2020

Dipublikasikan Oktober 2020

### ABSTRACT

*This study aims to analyze the impact of ICT on bilateral trade in service between Indonesia and its ASEAN trading partners. The sample is bilateral export in service between Indonesia and 9 ASEAN countries such as Malaysia, Philippines, Singapore, Thailand, Brunei Darussalam, Vietnam, Myanmar, Laos and Cambodia. The total trade in service data is based on UN-Comtrade. This study uses the gravity model framework of data panel from 2005 to 2017. Based on the regression analysis, results show that sub-index of ICT Development Index (IDI) such as mobile-cellular telephone subscriptions per 100 inhabitants which represents technology development, has a positive and significant impact on Indonesia's service export to ASEAN countries. Other variables such as GDP and distance also have significant effect on Indonesia's export in service. GDP reporter, GDP partners and common language have positive and significant effect on Indonesia's export in service. Furthermore, distance has a negative and significant effect on Indonesia's export in service. These results are in line with Gravity model theory. In addition, these results are expected to be strong enough for the specifications of alternative models and estimation methods. Based on these results, some expected trade policy recommendation related to trade in service and telecommunication particularly trade between Indonesia and ASEAN countries can be formulated. For instance, to strengthen Indonesia's networking and infrastructure of telecommunication in ASEAN countries. To build more Base Transceiver Station (BTS) located in trading partners in ASEAN. Telin Singapore established by Telkom Indonesia is officially established in 2007 and is the first Telkom footprint in international business. Since Singapore is Indonesia's trading partner which has the highest of ICT Development Index among other ASEAN countries, the Indonesian government need to continue the implementation of Information and Communication Joint Committee Indonesia-Singapore.*

**Keywords:** ICT, Service trade; Gravity model

**Kode Klasifikasi JEL:** O33; F10; C29

© 2020 MediaTrend

Penulis korespondensi:

E-mail: [dyah.wardani@umy.ac.id](mailto:dyah.wardani@umy.ac.id)

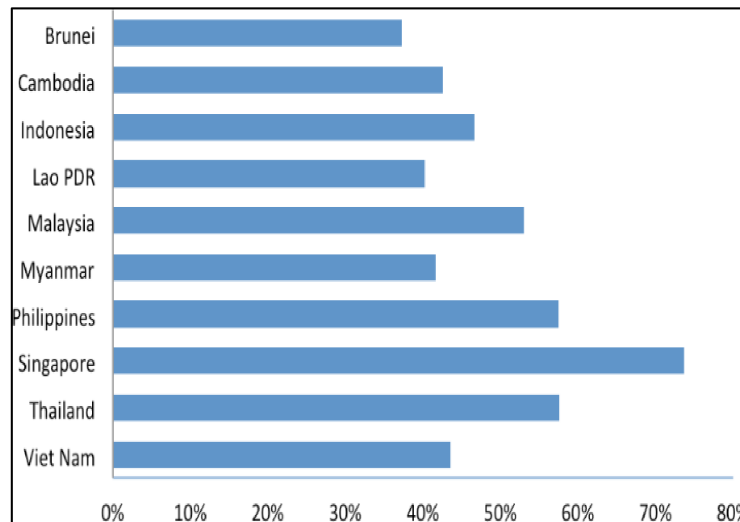
DOI: <http://dx.doi.org/10.21107/mediatrend.v15i2.5858>

2460-7649 © 2020 MediaTrend. All rights reserved.

**INTRODUCTION**

Technology plays an important role in international trade and commerce since international trade is one of the sources of growth. International trade is as one of the engines of growth (Haruna et al., 2020).

a sizeable and continuously expanding component of Gross Domestic Product (GDP) in ASEAN economies (Xie & Baek, 2020). As of 2016, an average ASEAN Member State now generates about 37% to 74% of its GDP from the services sectors,



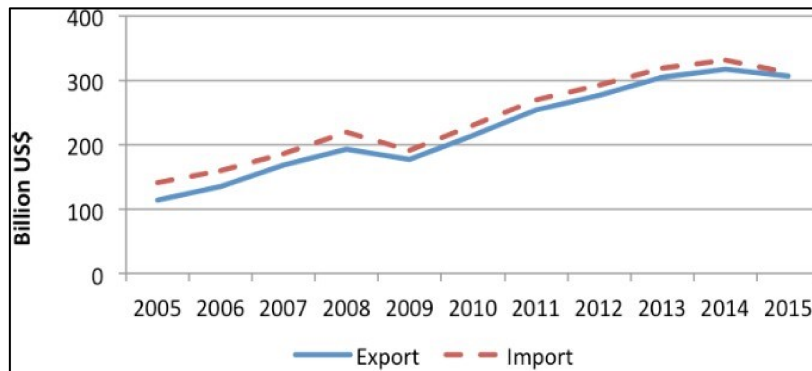
Source: ASEANStats, 2015

**Figure 1**  
**Services as Percentage of GDP, 2016**

With rapid advances in Information and Communication Technology (ICT) since the 1990s, as well as increased efficiency for transport of goods and people across national boundaries, the variety of sectors and volume of services provided across national boundaries are rising fast (Racela & Thoumrungroje, 2020). More and more people are traveling abroad to consume tourism, education and medical services, as well as to supply services ranging from construction to software development. Likewise, more and more business transactions and delivery of services projects such as engineering design and financial market consultancy are undertaken through electronic channel such as internet and other telecommunication network (Tee et al., 2020). Services is

as compared to the agriculture and industrial sectors. Even the lowest among ASEAN Member State, Myanmar, now generates 38% of its output from the services sector, while Singapore as the highest among ASEAN Member States generates 72%.

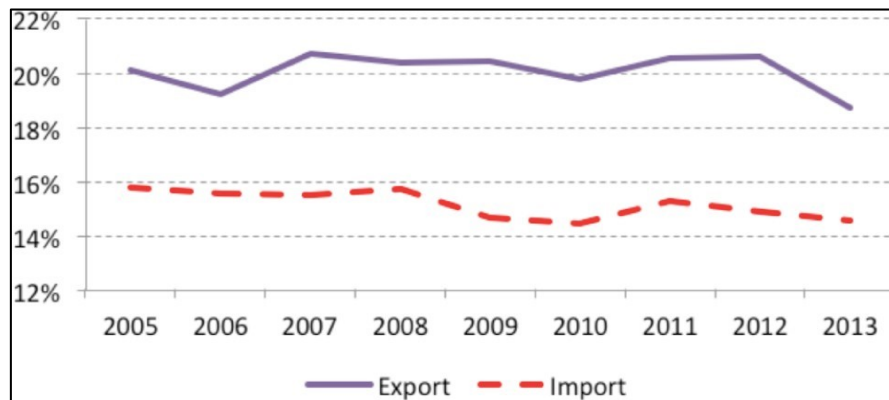
In terms of trade, ASEAN’S export of services grew from US\$ 113.4 billion in 2005 to US\$ 305.9 billion in 2016, or at an annual average growth rate of 11.6%. Within the same period, ASEAN’S import of services increased from US\$ 140.8 billion to US\$ 311.6 billion, or at an annual average growth rate 9.2%. Note that, there was a decrease of trade volume around 2008-2009, affected by the global economic crisis around that period.



Source: ASEANStats, 2016

**Figure 2**  
**ASEAN's Export and Import in Services**

During this 2007-2013 period, ASEAN Member States exported around 18% to 20% of their services to other Member States, and imported around 14% to 15% of their services from other services of ASEAN in general. ASEAN's services comprised 35.2%, 20.9% and 20.8% of total import, respectively. Travel, transport, and other business services dominate the export and import of services of ASEAN in general. ASEAN's



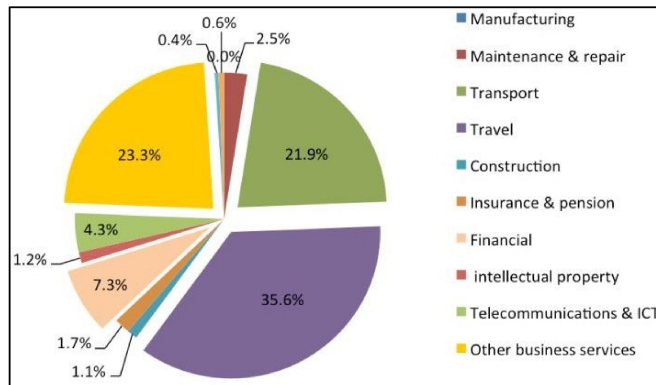
Source: ASEANStats, 2014

**Figure 3**  
**Intra-ASEAN Trade in Services**

Member States. In terms of the 11 services sectors classified according to the BPM5 standard<sup>5</sup>, the most significant sectors of ASEAN export and import of services are transport, travel and other business services. As of 2013, ASEAN'S export of transport, travel and other business services comprised 21.8%, 37.1% and 22.1% of total export, respectively. For the same year, ASEAN's import of these

export is dominated by travel services, while ASEAN's import is dominated by transport services.

In the distant fourth place, ASEAN's export is also contributed by financial services, while ASEAN's import comes from charges for the use of intellectual property. These services sectors are classified based on IMF Balance of Payments Manual, 6<sup>th</sup> Edition.

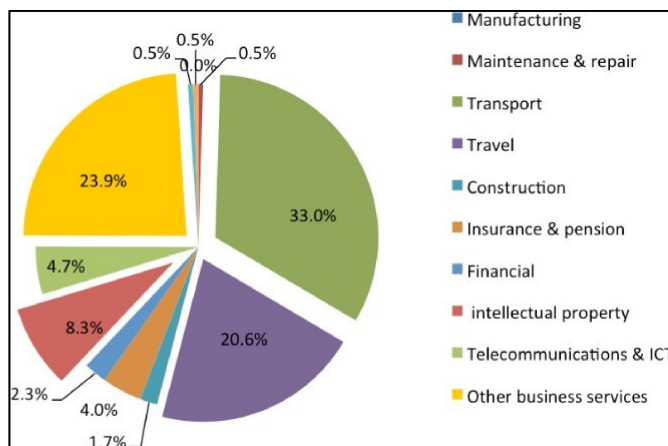


Source: ASEANStats, 2016

**Figure 4**  
**ASEAN Export in Services by Sectors, 2015**

“Free flow of trade in services is one of the important elements in realizing ASEAN Economic Community, where there will be substantially no restriction to ASEAN services suppliers in providing services and in establishing companies across national borders within the region, subject to domestic regulations” (ASEAN Economic Community Blueprint, November 2007). Services are increasingly important components of economic output in any country. While agriculture and

manufacturing remain very important, services continue to gain importance and share in any country’s Gross Domestic Product (GDP). Recognizing the importance of services trade, ASEAN members have initiated negotiations concerning the services sector since 1995, when the countries first decided to negotiate an ASEAN Framework Agreement on Services (AFAS). Three main areas of commitments commonly appear in an agreement on trade in



Source: ASEANStats, 2016

**Figure 5**  
**ASEAN Import in Services by Sectors, 2015**

services. The first one is related to market access for services from abroad or from foreign services providers. The second form of commitment involves concerns about trade in services and national treatment, and regulates what foreign providers of services need in order to obtain the same treatment as domestic providers. The third area involves commitments that require domestic regulations to follow reasonable, objective and impartial rules, often achieved by providing greater regulatory harmonization. Furthermore, the subsequent decision at the 11th ASEAN Summit in December 2005 to accelerate the liberalisation of trade in services by 2015, re-affirms the seriousness of ASEAN to further integrate its services sector and deepen its economic integration process.

Indonesia's service sector has emerged as a new source of growth, while the sector has always been the largest in the Indonesian economy, several changes have taken place during the last three decades of economic development (Nasution & Sirojuzilam, 2020). Along with the economy's structural transformation from agricultural-based economy to manufacturing and later to a services-based economy, the service sector's contribution to Indonesia's GDP has increased from 38% in 1970 to 51% in 2014. In accordance to its greater contribution to GDP, the services sector has become the biggest source of job creation as well, constituting 43% of total employment. Indonesia's services trade has also grown steadily due to increasing export and import activities. In Indonesia, services only significantly contribute to the export of technology intensive manufacturing, although that figure still remains lower than values in other countries. Elsewhere, services contribute significantly to the value of goods produced in the manufacturing sectors, making up 25-35% of the value

of exported products. Again, technology-intensive manufacturing, such as that of electronics and machinery, uses more services in the production process, and is more dependent on GVCs than are other sectors of the economy.

Kimura & Lee, (2006) assess the impact of various factors on bilateral services trade, relative to that on bilateral goods trade. To accomplish this purpose, using the standard gravity model, they ran regressions on bilateral services trade and goods trade between 10 OECD member countries and other economies, including OECD member and nonmember countries, for the years 1999 and 2000. Furthermore, find one interesting result, that is, gravity equations is better to predict service trade than good trade. Another interesting result is that, there is a complementary relationship between goods exports and services imports. Garín-Muñoz & Amaral, (2000) measures the impact of the economic determinants of the international demand for tourist services in Spain. A panel data set of seventeen countries over the period 1985–1995 is used. By using appropriate panel data techniques the effects of real per capita income, exchange rates and real prices on the demand for Spanish tourist services. The estimated elasticities are +1.40, +0.50, and -0.30, respectively. The negative effect of the Gulf War is also detected, with a coefficient of -0.15. These results are comparable to previous empirical studies for other countries.

Ketenci & Uz, (2010) include the analysis of global trade in the services and service sector in Turkey, and estimates the elasticity of trade in services to real exchange rates and income. There is an increasing role of the service sector in the Turkish economy; however, a decreasing trend of trade in services is taking place. The commitments of the GATS were found to be ineffective, at least in the case of Turkey. The empirical findings suggest that the real exchange rate is not a signifi-

cant determinant for the trade in services. They found an inelastic real exchange rate and income elasticities in trade demand functions. However, the value of income elasticity significantly exceeds the value of real exchange rate elasticity.

Technology and types of goods greatly influence the decisions of importing countries in buying goods from exporting countries. Ozcan & Nath, (2016) analyse the impacts of information and communication technology (ICT) on international trade between Turkey and its trading partners. Based on an extended panel gravity model, the effects of four ICT indices on Turkish bilateral exports and imports are examined with static and dynamic panel data models for the period 2000-2014. The sample includes 35 countries that import Turkish goods and 34 countries that export goods to Turkey. The results indicate that ICT has positive and significant impacts on both Turkish import and export volumes. Additionally, ICT has a larger effect on imports than on exports. Among ICT indices, ICT access has the largest effect on exports while ICT skills have the strongest impact on imports. In contrast, ICT use has the least impact on both Turkish exports and imports. These results are robust to alternative specifications and estimation methods. Based on these results, some policy implications can be derived. For instance, Turkey may develop strategic trading partnerships with countries that have high levels of ICT endowments, in order to increase its overall trade.

Liu & Nath, (2013) examines the effects of information and communications technology (ICT) on international trade in emerging markets. Using panel data for 40 emerging market economies (EMEs) for a period from 1995 to 2010, we estimate fixed effects models of exports and imports with ICT as the main explanatory variable of interest. Our ICT variables include the growth of telecom investment, international

Internet bandwidth, Internet subscriptions per 100 people, and the number of Internet hosts per 100 people. The first two variables represent ICT infrastructure while the last two represent the use of ICT. Liu and Nath (2013) use the share of total exports and of total imports in GDP as the dependent variables. Additionally, we consider the GDP share of exports and imports for goods and services separately. The main control variables are: per capita GDP growth, population growth, and country and year fixed effects. The empirical results overwhelmingly suggest that Internet subscriptions and Internet hosts have significant positive impacts on both export and import shares in EMEs. Thus, the trade enhancing effect of ICT does not depend on ICT infrastructure or ICT capability per se but on its use. This result is robust to a number of sensitivity checks: generalized method of moments (GMM) estimation with lagged independent variables as instruments; inclusion of all four ICT variables together; shorter sample period; a subsample of EMEs; dynamic specification with lagged dependent variable; and an alternative model specification with additional variables. These results suggest that policies to encourage the use of ICT would have a positive impact on trade in EMEs.

The reason of using mobile-cellular as key variable factor, it is because the use of mobile phone as determinant of trade. Mobile phones and internet have become synonymous nowadays (Arslandere et al., 2020). Specifically, with the advent of many user-friendly apps (applications) geared towards market and trade such as amazon.com, flipcart.com etc, the mobile has become a mobile market that can be accessed from any where and at any time. Indonesia also highlighted the phenomenal growth of mobile users and sharp decline in landline users, one of the fastest growing

telecom markets of the world.

ICT infrastructure is always associated with reduction in communication cost. They found that international differences in costs of communication certainly showed a significant impact on the trade trends and also found that costs of communication are more significant for differentiated products in trade rather than for trade in homogenous or standardized products (Liu & Nath, 2013). There are four channels how ICT can lead to a decline in trading costs. First, reduce of the cost of communications and search as well as cost of match occurs because of the existence of ICT use, which is a cause to more transparency in the market. Second, the reduction in costs for the monitoring and management of the firm will occur with the existence of the use of ICT. Third, decline in costs of shipping due to the existence of the use of ICT that is due to changes in organization and digitization. Fourth, the use of ICT can reduce time in transit and the associated costs.

This study focuses on the country of Indonesia as a country reporter, while other ASEAN-9 member countries are Indonesian trading partners. By the high percentage of the world trade in service, yet the declining Indonesian export in service to ASEAN countries, the research attempt to reveal on what determinants of Indonesia export in service to ASEAN countries. Moreover, researchers want to examine to what extent the technological progress has effect on export in service.

## RESEARCH METHODS

Panel data regression is a regression whose data type is a combination of time series data and cross section data. To estimate model parameters with panel data, there are several models offered, namely the first, if the coefficient is fixed between time and between individuals, or often called the Partial Least Square (PLS) (Benedictis & Vicarelli,

2014). This approach does not pay attention to the individual and time dimensions. The parameter estimation model in this model is the same as the linear regression model by ignoring time series data and cross data. This model assumes constant intercept and slope for all time series and cross data units.

The second model is the Fixed Effect, which wants heterogeneity between individual subjects by giving each entity its own intercept value. Even though the model is different for each subject, the intercept of each entity does not change over time. The third model is the Random Effect, where this technique pays attention to the heterogeneity of variables according to individuals and pays attention to different impacts for each individual. These differences are accommodated by mistake. This technique also takes into account that errors may be correlated over time-series data and data crossovers.

This research using partial least square (PLS), fixed effect model (FEM) and random effect model (REM) for estimation. A balanced panel data set is used which has equal number of observations for each individual and for best model selection, FEM hypothesis testing, REM versus FEM, Hausman specification test and Breusch-Pagan Lagrange Multiplier test are used. The LM test was applied to define the types of individual effects and the time effect (random or fixed). As the selected countries were not members of a specific economic group, it was predicted that the individual effects could be random and the time effects could be random as the majority of the countries in the examined period had been affected by an economic crisis. Whether or not the effects are really random can be decided with the LM test. The Hausman method was applied to test whether or not there was a relationship between the variables explaining the individual effects.  $H_0$  was

rejected and it was decided that there was an internality problem in the model. When there is an internality problem, a fixed effects model is used. When H0 is accepted, a random effects model is used. This prediction is effective, without deviation and consistent. The Hausman test is not an alternative to the LM test. However, a function is seen to be provided by the decision made with the LM test.

This research is focused on 9 ASEAN countries as the destination of Indonesian service exports, namely Malaysia, Thailand, Philippines, Singapore, Vietnam Brunei Darussalam, Myanmar, Laos and Cambodia. With a period of time from 2008 to 2017 (period with complete data). Thus, the regression model used in this study is as follows:

$$\text{Log}(\text{Export}_{it}) = \alpha + b_1 \log(\text{Dist}_{it}) + b_2 \log(\text{GDPIndo}_{it}) + b_3 \log(\text{GDPASEAN}_{j_{it}}) + b_4 \text{cellphone}_{it} + b_5 \text{Comlang}_{it} + e_{it} \quad (1)$$

A first step in examining the intuition behind the gravity model is to examine the correlations among the variables. To do that, this research select the variables for which we are interested in calculating the correlation. In this case, these are: trade, distance, GDP of export country and GDP of import country. Afterwards we make sure no zero and missing values are included. Before moving to the details of gravity modeling using econometric methods, we can use graphical techniques to examine the basic intuition underlying the model.

### RESEARCH RESULT

Results and discussion are important in a study. This is because it deals with testing theory. Existing theories are tested and matched with real conditions. If the existing theory is in agreement with the emporic results, then the discussion is easier, but if it is not

**Table 1**  
**Chow Test**

Effect Test	Prob
F(4, 77 )	4.39
Prob > F	0.0030

Where:

Export<sub>it</sub>: Indonesian service export to ASEAN (US \$). Dist<sub>it</sub>: Distance (miles). GDP<sub>it</sub>: GDP of Indonesia (Million US \$). GDP<sub>j<sub>it</sub></sub>: GDP of Indonesia's partners in ASEAN (Million US \$). Cellphone<sub>it</sub>: Mobile-cellular telephone access (Mobile-cellular telephone subscriptions per 100 inhabitants). Comlang<sub>it</sub>: Common language (English). α: Constant. e: Error term. i: Country. t: Time (Year).

appropriate, then it must be supported by previous studies.

Based on the table above, the probability value of F-statistics is below 5%, which is equal to 0,000 or less than 0.05. Then it can be concluded that H<sub>0</sub> is rejected and accepts H<sub>1</sub>, which means the regression results of the Fixed Effect Model are better to use.

Based on the Hausman test results above, the probability value

**Table 2**  
**Hausman Test**

chi <sup>2</sup> (6)	1.23
Prob > chi <sup>2</sup>	0.8740



**Table 3**  
**LM Test**

chibar <sup>2</sup> (01)	10.16
Prob > chibar <sup>2</sup>	0.0007

(0.8740) produced is greater than 0.05. It can be concluded that H0 is accepted and H1 is rejected, which means that the data owned by the Random Effect Model is more suitable for use in this study.

Based on the Language test results above, the resulting probability value (0.0007) is less than 0.05 so it can be concluded that the model used is a random effect. After doing the statistical test to determine the model used, it can be concluded that Random Effect. The estimation results are presented in table 8 as follows: After doing some statistical tests to determine the model chosen in the study, it can be concluded that the random effect model with the Fixed Generalized

Least Square method will be used in this study. The following are the estimation results in table 4.

The estimation results show that Indonesia's GDP has a significant effect on service exports. This means that Indonesia's GDP plays a role in influencing the performance of ASEAN's service exports. b1 of -0.8882, it means that, with a significance level of 1%, there is enough evidence that every 1% increase in GDP of the home country will reduce the percentage of Indonesia service exports to ASEAN by 0.8882%. The negative coefficient means that an increase in Indonesia's GDP actually depresses exports, because an increase in

**Table 4**  
**Model Specification**

Independent variable: Export	Model		
	Common Effect	Fixed Effect	Random Effect
Constant	14,0301	14,0301	9,8519
Standard Error	9,8596	9,8596	0,9990
P-Value	0,158	0,158	0,324
log GDP Indo	-1,0199	-1,0199	-0,8882
Standard Error	0,3612	0,3612	0,3768
P-Value	0,006***	0,006***	0,018**
log GDP ASEAN <sub>j</sub>	1,3321	1,3321	1,3604
Standard Error	0,0437	0,0437	0,0919
P-Value	0,000***	0,000***	0,000***
log Dist <sub>ij</sub>	-0,9353	-0,9353	-0,9305
Standard error	0,0987	0,0994	0,1970
P-Value	0,000***	0,000	0,000***
Mobile-Cellphone <sub>j</sub>	0,0063	0,0063	0,0048
Standard Error	0,0019	0,001	0,0022
P-Value	0,013	0,000	0,034**
<b>Comlang<sub>ij</sub></b>	0,7990	0,7990	0,8365
Standard error	0,1479	0,1479	0,2995
P-Value	0,000	0,000	0,005

Source: Author Estimation; where: \* = p < 0.01; \*\* = p < 0.05; \*\*\* = p < 0.1

Indonesia's GDP prefers to increase imports. This allows the government to increase exports by seeking new market shares. Adding product variants to export and maintaining product quality so that it is increasingly in demand by foreign markets (Nasution & Sirojuzilam, 2020).

From our estimation result, this research reveals that GDP of exporting countries has a positive and significant effect on Indonesia's export to ASEAN countries. Moreover, the increase in GDP of importing countries increases Indonesia's export to ASEAN (Tran et al., 2020). Greater RGDP can be translated into greater economic activities in the importing country. If economic activities in exporting and importing countries become greater, they prefer to export more than imports, the commodities in this case is service products. As shown by our findings one percentage point increase of real GDP (exporting country) will increase about 1.954% on Indonesia's export to ASEAN partners. Moreover, one percentage point increase of real GDP (importing countries) will increase 1.218% on Indonesia's export to ASEAN partners. A positive sign in RGDP reporter and RGDP partners is in line with the Gravity model theory. Meanwhile, according to the result, one percentage point increase in distance between countries will reduce the export flows of Indonesia with ASEAN partners as much as 0.9305%. Similar to the previous study by Disdier & Head (2008). In terms of economic size, one percentage point increase in GDP of the home country will reduce the percentage of Indonesia service exports to ASEAN by 0.8882%. While one percentage point increase in GDP of trading partners will increase the number of Indonesia service exports to ASEAN by 1.3604%.

Moreover, our research focus in ICT development, one percentage point increase in mobile cellular telephone trading partners will increase the

percentage of Indonesia service exports to ASEAN by 0.0048%. This result also proved that two-way communications between both exporting and importing countries with good and effective facilities of ICT can give benefit to both trading partners (Kamal et al., 2020). The role of ICT is play an significant role in international trade (Riedel & Slany, 2019). Lastly, the similarity in language (common language) will increase the percentage of Indonesia service exports to ASEAN by 0.8365%, which implied that, the similar the language between exporter and importer the more the trade between them.

Policy interest in ICT services and ICT engaging services trade is very high. It represents an increasingly important component of the information economy, and also an interest of policymakers and other stakeholders (Su et al., 2020). It offers considerable development opportunities by linking economies into global value chains and enhancing the productivity and competitiveness of ICT-using industries (Sun & Li, 2018).

The reasons behind the positive impact of per cellular-mobile subscription on trade flow can be varied in nature. The advent of smart phones turned the trade and commerce from static to dynamic. Mobile and internet are synonymous recently. Ever increasing number of private players in mobile phone market has flooded the market and significantly enhanced the access of mobile phones to the common people and this resulted in price reduction through intense competition (Fatema & Monirul Islam, 2020). On the other hand, the increase in the number of mobile service providers and their innovative pricing policies led to cheaper and better digital connectivity. Apps like Amazon and in Indonesia like shopee and tokopedia are growing popular more and more and both are dedicated towards trade whether it is domestic or international through digital

platform (Virginia & Novianti, 2020). Efficient product return policies and online visual display of products are creating a level of trust in the minds of the consumers. There might be significant peer influence on the consumer (Chang et al., 2020). Furthermore, the increase in production and that in labour intensive countries would definitely boost employment and increase the income level, leading to higher effective demand. Hence, increase in cellular-mobile subscription is an indicator of economic growth and development that also increase trade. South East Asia has shown its efficiency in regional economic cooperation through the success of ASEAN.

## CONCLUSION

Variables of the Gross Domestic Product (GDP) both Indonesia (the country of origin) and its ASEAN trading partners have significant influence on Indonesia's service exports. GDP Indonesia has a significant and positive sign, this means that the greater the GDP of the country of origin, the greater the Indonesian service exports to ASEAN. Moreover, the variable of GDP of trading partner countries has a significant influence on Indonesian exports in 2005-2017 explains that the greater the GDP of trading partner countries, the greater Indonesia's exports to ASEAN countries. Furthermore, the variable of distance between Indonesia and ASEAN has a significant and negative effect on Indonesian service exports to ASEAN in 2005-2017.

This means that, the farther the distance between the Indonesia and its trading partner in ASEAN countries, will reduce the number of Indonesian service exports to ASEAN. The ICT variable is indicated by cellular phone usage of ASEAN countries has a significant effect on Indonesian service exports to ASEAN. This means that the higher level of

technology in trading partner countries will facilitate communication and increase Indonesian service exports to ASEAN. Thus, the results confirmed that ICT act as one of the key engine to facilitate and enhancing trade. Finally. The variable of common language between two countries (Indonesia and its trading partners in ASEAN) have a significant influence on Indonesian service exports to ASEAN in 2005-2017. This means that the similarity of language will add to Indonesia's service export value. The role of ICT in service trade intend to create a conducive business environment to attract and promote trade, investment and entrepreneurship in the ICT sectors via activities under the two following Initiatives: (1) Create a conducive environment where business can grow leveraging ICT and (2) Develop trade partnership initiatives for the ICT industry.

## REFERENCE

- Arslandere, M., Tuncer, İ., & Ada, S. (2020). The Impact of Ict Use in Promotional Activities on Export Performance: An Empirical Investigation. *Business & Management Studies: An International Journal*, 8(2), 2384-2413. <https://doi.org/10.15295/bmij.v8i2.1515>.
- Benedictis, L. D., & Vicarelli, C. (2014). Trade Potentials in Gravity Panel Data Models. *The B E Journal of Economic Analysis & Policy*, 5(1), 19351682.
- Chang, Y.-T., Jo, A., Choi, K.-S., & Lee, S. (2020). Port efficiency and international trade in China. *Transportmetrica A: Transport Science*, 1-23. <https://doi.org/10.1080/23249935.2020.1817169>.
- Fatema, F., & Monirul Islam, M. (2020). Driving Forces of Marine Fisheries and Seafood Export of Bangladesh: Augmented Gravity Model

- Approach. *Asian Journal of Economic Modelling*, 8(2), 106-122. <https://doi.org/10.18488/journal.8.2020.82.106.122>.
- Garín-Muñoz, T., & Amaral, T. P. (2000). An Econometric Model for International Tourism Flows to Spain. *Applied Economics Letters*, 7(8), 525-529.
- Haruna, Y. U., Muhammad, B., & Omoren, U. (2020). Panel Data Analysis of International Trade in West African Sub Region. *American Journal of Theoretical and Applied Statistics*, 9(4), 106. <https://doi.org/10.11648/j.ajtas.20200904.14>.
- Kamal, M. A., Shad, S., Khan, S., Ullah, A., & Khan, K. (2020). Pakistan's trade performance and potential with ASEAN region: Recent trends and future opportunities. *Journal of Public Affairs*, 1-12. <https://doi.org/10.1002/pa.2325>.
- Ketenci, N., & Uz, I. (2010). Trade in services: The elasticity approach for the case of Turkey. *MPRA Paper No. 86596*.
- Kimura, F., & Lee, H. H. (2006). The Gravity Equation in International Trade in Services. *Review of World Economics*, 142(1), 92-121.
- Liu, L., & Nath, H. K. (2013). Information and Communications Technology (ICT) and Trade in Emerging Market Economies. *Emerging Markets Finance and Trade*, 1-28.
- Nasution, L. M., & Sirojuzilam. (2020). Analysis of Indonesia's Tire Export Development Strategy. *EPRA International Journal of Multidisciplinary Research (IJMR)*, 6(9), 152-158.
- Ozcan, B., & Nath, H. (2016). Information and Communication Technology (ICT) and International Trade: Evidence from Turkey. *Working Papers 1609*, Sam Houston State University, Department of Economics and International Business.
- Racela, O. C., & Thoumrungroje, A. (2020). Enhancing Export Performance through Proactive Export Market Development Capabilities and ICT Utilization. *Journal of Global Marketing*, 33(1), 46-63. <https://doi.org/10.1080/08911762.2018.1549302>.
- Riedel, J., & Slany, A. (2019). The potential of African trade integration – Panel data evidence for the COMESA-EAC-SADC Tripartite. *The Journal of International Trade & Economic Development*, 1–29.
- Su, X., Anwar, S., Zhou, Y., & Tang, X. (2020). Services trade restrictiveness and manufacturing export sophistication. *The North American Journal of Economics and Finance*, 1–14. <https://doi.org/10.1016/j.najef.2019.101058>.
- Sun, Z., & Li, X. (2018). The trade margins of Chinese agricultural exports to ASEAN and their determinants. *Journal of Integrative Agriculture*, 17(10), 2356–2367. [https://doi.org/10.1016/S2095-3119\(18\)62084-2](https://doi.org/10.1016/S2095-3119(18)62084-2).
- Tee, B. A., Tham, S. Y., & Kam, A. J. Y. (2020). The Role of ICT in ASEAN-5's Services Exports: A Panel Study. *Malaysian Journal of Economic Studies*, 57(1), 1-19. <https://doi.org/10.22452/MJES.vol57no1.1>.
- Tran, H. X., Nguyen, A. T., Truong, H. Q., & Dong, C. V. (2020). China-ASEAN Trade Relations: A Study of Determinants and Potentials. *The Journal of Asian Finance, Economics and Business*, 7(9), 209–217. <https://doi.org/10.13106/jafeb.2020.vol7.no9.209>.
- Virginia, A., & Novianti, T. (2020). Non-Tariff Measures (ntms) and Indonesian Natural Rubber Export to the Main Export Destination

- Countries. *Journal of Developing Economies*, 5(1), 57-69. <https://doi.org/10.20473/jde.v5i1.18609>.
- Xie, Y. D., & Baek, Y. (2020). Impact of Exchange Rate and Firm Heterogeneity on Exports Empirical Evidence from Four ASEAN Economies. *Southeast Asian Economies*, 37(2), 199-223. <https://doi.org/10.1355/ae37-2e>.