



Determinants of Trade in Services

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Abstract: This paper aims to analyse the determinants affecting the trading of services and examine the causality between the trading of services and the factors affecting the trade. For the study, the fixed effects panel data regression has been used. The results indicate that as the income of a country increases, its trade in services also increases. The use of the internet and mobile phones are also important indicators of trade in services and an increase in their use reduces the cost of trading services. Free trade agreements play an important role in developing countries like Brazil and China for trading services. The paper has been organized as follows – the first section gives a brief introduction about services and the objectives of the study, the second section is a discussion about the existing literature, section three gives the data and methodology used for this study, the fourth section provides the results and analysis, section five concludes the study, and the last section discusses some of the limitations of the study.

Keywords: panel data; gravity model; foreign trade.

JEL: C23, F10

Determinante trgovanja s storitvami

Povzetek: Namen članka je analizirati dejavnike, ki vplivajo na trgovanje s storitvami, in raziskati vzročnost med trgovanjem s storitvami in dejavniki, ki vplivajo na trgovino. Za študijo je bila uporabljena regresija panelnih podatkov s fiksnimi učinki. Rezultati kažejo, da se s povečanjem dohodka države povečuje tudi trgovina s storitvami. Uporaba interneta in mobilnih telefonov sta prav tako pomembna kazalnika trgovine s storitvami in povečanje njihove uporabe zmanjšuje stroške trgovskih storitev. Sporazumi o prosti trgovini igrajo pomembno vlogo pri trgovanju s storitvami v državah v razvoju, kot sta Brazilija in Kitajska.

Ključne besede: panelni podatki; gravitacijski model; zunanja trgovina.

1 Introduction

A service is a transaction in which no physical transfer of goods takes place. It is an intangible property that is consumed at the endpoint of a sale. According to the World Trade Organisation (WTO), trade in services is one of the most dynamic segments of world trade and is growing more rapidly than trade in goods. International trade in services has gained more importance as technological advancements have aided new means to provide services across the border. Global services trade was estimated at

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US\$ 5.4 trillion in 2017¹. Services are dominating the global economy just as they have been dominating many national economies. In 2017, developing countries made up 34.4% of world imports and 25% of world exports of services. Between 2005 and 2017, trade in services grew annually at 5.4% on average (World Trade Report, 2019).

In recent times the non-tradable services have become highly tradable. This shift can be attributed to digitalization and technological advancements. The globalization of services has increased rapidly as the new technologies have created markets across borders for the existing services. It has also propelled the development and innovation of new services industries and ways of delivering them. Services such as educational services, recreational services, information services, and many such services which were once non-tradable, because they had to be delivered at a fixed location and face-to-face, have become highly tradable as they can now be delivered remotely. The delocalization and globalization of some of these services, like retail services, computer services, and business services, has scaled to the extent that they may surpass the global multinational goods manufacturers. Simultaneously, services like medical services, educational services, and entertainment services are also moving towards becoming globalized. Medical information is now easily accessible through the internet, and procedures like consultations, diagnostics, and even surgeries are being performed remotely. Likewise, educational services are also readily available with more and more e-learning platforms coming up and platforms such as YouTube being used effectively for the dissemination of such services. The rise of streaming platforms like Netflix and Spotify have enabled the spread of entertainment services. However, the full potential of trade in services is yet to be realized because services industries are still catching up on the business opportunities created by technology. Such shifts in technologies have enabled many services industries to specialize and gain economies of scale, a process that drove colossal productivity gains in the manufacturing sector. These gains have been realized by the finance, telecommunications, and information service sectors, which attained productivity growing faster than many manufacturing industries. However, as technology is playing a pivotal role in the expansion of trade in services, policies at the national and international level addressing regulations and cooperation are also crucial. The world trading system has not been successful in opening up trade in services like the trade in goods was opened up in the 20th Century.

Broadly speaking, the trade of goods is more open as compared to the trade of services. This means that the facilitation of trade of goods is easier with simpler tariffs, quotas, and other barriers to trade. The equivalent measures affecting the international trade of services such as licensing, professional standards, work visas, etc. are far more complex and can easily be linked to other political policies. The policies regarding Mode 4 (Presence of natural person) of trade of services have been controversial in recent times, which have had consequences on innovation and growth of businesses.

Trade in services can provide opportunities to shift from resource-based and manufacturing-led exports to leapfrog into higher-value exports for developing economies. China, which has emerged as the hub for manufacturing goods, is shifting into services. China's services accounted for 41% of GDP in 2005, which has risen to 52% now (World Trade Report, 2019). For India, the increase had been from just 30% in 1970 to 50% in 2018. For Brazil, the share has been even higher at 53% of its GDP (World Trade Report, 2019). According to The Economist (2011), as services are less capital intensive, have higher accessibility for women, and are more mobile, they are more advantageous for developing countries. Trade in services can also help developed nations to retain global competitiveness.

In this light, the researcher recognizes the notability of the trade in services and aims to –

- 1) Analyse the factors affecting trade in services.
- 2) Examine the causality of trade in services and the factors affecting the trade.

1.1 Review of literature

The existing literature on trade costs in services is reviewed. This review of the literature provides essential insights into the developments in the services trade and its determinants.

Kimura and Lee (2006) suggest that geographical distance is more imperative for services than it is for goods, which implies that the cost of tradable services is higher than that for goods. The study suggests that the gravity equation is more apt for services than for goods. The authors find that rich countries export as well as import more services. The presence of land border has only a minor impact on the flow of services. RTAs have a significant

¹ <https://stats.unctad.org/handbook/Services/Total.html>

impact on the export of services of OECD countries, and that RTAs facilitate trade in services just as much as they facilitate trade in goods. The study considers the Economic Freedom of the World Index computed by the Fraser Institute of Canada. Countries with greater economic freedom engage in higher trade in services, and economic freedom has a significant impact on the export of services. This implies that the trade-in services will grow faster than the trade in goods as economies liberalize. The authors also find that the export of services is 50% greater between countries using the same language. It is interesting to note that according to the study if exports of a country are 1 unit above normal, then imports of services are 0.22~0.262 units above normal. This implies the existence of trade in factor services which propel the export of goods.

Walsh (2006) estimates the gravity equation for four disaggregated service sectors of government, transport, travel, and other commercial services. The author notes that the GDP per capita increase by 1% leads to a 1.3% increase in imports of services. A positive impact is noted on the import of travel services, transport services, and commercial services. The existence of a common language is found to a significant effect on the trade in services. Import of travel services, transport services, and commercial services are positively influenced by a common language. However, Walsh (2006) finds that distance does not significantly influence the trade flows of services. The findings of the study suggest that a country needs a sufficiently high-income level to export government services, as GDP per capita is the only significant variable for trade in government services.

Anderson, Borchert, and Mattoo (2018) use the structural gravity model to estimate the barriers to sectoral services trade and study the determinants of the barriers to trade in services. The authors find that border barriers are larger, more significant, and vary widely for the OECD countries and that economic size is inversely proportional to border barriers in services trade. For sectors like travel distance has a significant and large impact on the services trade. Whereas, for sectors such as financial services and transportation services, distance has a lesser impact on services trade. One of the reasons could be the presence of fixed costs. Language has been noted to positively affect bilateral trade in services for communication, travel, insurance, and audio services. However, the impact of language is found to be negative for the computer and research services.

According to Loungani, Mishra, Papageorgiou, and Wang (2017), services such as telecommunications, and computer and information services have been gaining increasing importance. The exports of computer and information services have grown at an average annual rate of 18% from 1995 to 2014. The financial sector and financial technologies have also been witnessing high growth rates. The authors note that travel and transport services make up a considerable part of the services exports from developing countries. Remarkable development is observed in finance, computer and information, intellectual property, and business in the developing countries. Europe is the leader in the export of services, and Asia and Pacific regions have surpassed North America. The South Asian region has been experiencing high growth in the computer and information services, whereas, the East Asian region has been gaining competitiveness in travel and intellectual property sectors. The emerging nations of India and China have had impressive growth in the export of services, travel, transport, and information technology. Similarly, Hong Kong has turned into a financial hub.

From this literature, it is evident that not much research has been done on the determinants of trade in the services sector for the developing countries. Also, the existing works are limited to specific periods. Hence the researcher seeks to extend the analysis of determinants of trade in the services for developing nations and to more recent periods.

2 Methodology and data

For the study, the structural gravity model has been used. The gravity is increasingly being used for modelling and estimating trade flows between countries. From the careful evaluation of the past works in this respect, it has been noted that the gravity model is a better fit for services than it is for goods.

The model used for the estimation is given as follows –

$$\begin{aligned} \text{LN}(\text{TRADE}_{ijt}) = & \beta_1 \text{LN}(\text{GDPPC}_{ijt}) + \beta_2 \text{LN}(\text{POPULATION}_{ijt}) + \beta_3 \text{LN}(\text{INT}_{\text{USERS}_{ijt}}) + \beta_4 \text{LN}(\text{MOB}_{\text{USERS}_{ijt}}) \\ & + \beta_5(\text{RE MOTENESS}_{ijt}) + \beta_6(\text{LANGUAGE}) + \beta_7(\text{FTA}) + \beta_8(\text{STRI}) \\ & + \beta_9(\text{DOMESTIC OUTPUT}) + \delta_t(\gamma_{ij}) + \varepsilon_{ijt} \end{aligned} \tag{1}$$

where:

'i' denotes country 'i', 'j' denotes country 'j' and 't' denotes the time.

LN(TRADE_{ijt}) is the total trade of the particular service.

LN(GDPPC_{ijt}) is the natural log of the GDP per capita of the country.

LN(POPULATION) is the natural log of the population of the country.

LN(INT_{USERSijt}) is the natural log of the number of internet users in the country.

LN(MOB_{USERSijt}) is the natural log of the number of mobile users in the country.

REMOTENESS_{ijt} is the log of the relative distance between the country 'i' and country 'j' at the time 't'. It is calculated as $\log \left[\frac{1}{\sum_{ijt} (GDP_{it}/GDP_{wt})} \div \text{Distance}_{ij} \right]$ where GDP_{wt} is the world GDP at the time 't' and Distance_{ij} is the distance between the capital cities of countries 'i' and 'j'.

LANGUAGE is the dummy variable that takes value one if the countries share a common language and 0 otherwise.

FTA is the dummy variable that takes value one if the countries are a part of a free trade agreement and 0 otherwise.

STRI is the services trade restrictiveness index of the particular service.

DOMESTIC OUTPUT is the domestic output of the particular service.

δ_t is the time dummy

γ_{ij} is the country dummy

ε_{ijt} is the error term

For the study 9 service sectors, namely, transport services, travel services, telecommunication services, computer services, personal, cultural and recreational services, commercial services, goods-related services, and total services have been considered. The sample consists of eight countries – Brazil, Canada, China, Germany, India, Indonesia, Singapore, and the USA. The service sectors have been chosen based on data availability, and all the countries considered are part of the G20 nations. The period considered for the study is from 2005 to 2018.

The data for the Y variable, TRADE_{ijt} has been extracted from the WTO-ITC-UNCTAD database. The exports and imports of the service have been added to get the total trade. This data is computed using the Balance of Payments method (BOP6). The data for the GDP per capita (GDPPC), POPULATION, number of internet users (INT_{USERS}), and the number of mobile users (MOB_{USERS}) have been extracted from the World Development Indicators (WDI) database. To calculate the REMOTENESS, the data for distance has been extracted from the CEPII database, and GDP has been taken from the WDI database. The dummy variable for LANGUAGE has also been extracted from the CEPII database. The data for the STRI has been extracted from the OECD STRI database, and the DOMESTIC OUTPUT data has been extracted from OECD's Input-Output tables. The DOMESTIC OUTPUT has been taken as the total output of the sector.

1.2 Results

The model has been estimated using the fixed effects panel data regression, taking into account the time-fixed effects and the country-fixed effects and the VECM model.

The estimated R² for the transport sector is found to be 0.917, which means that models explain 91.7%. The GDP per capita, dummy variables for FTA with China, Indonesia, and Singapore, and the year dummies are significant. The GDP per capita has a positive effect on trade in transport services. An increase in the GDP per capita would lead to a 66% increase in the trade in transport services. One possible explanation for this could be that people's movement from one place to another increase as incomes increase. Services like the carriage of goods and passengers and auxiliary supporting services are demanded more as incomes increase. However, the number of internet users showed a negative sign. The dummy variables for FTA with China and Singapore are positive signifying that having a free trade agreement with China or Singapore may enable higher trade in transport services – 20% and 37% respectively. However, the coefficients of dummy variables for FTA with Brazil and Indonesia have negative signs. A possible explanation for the dummy variables for FTA with Brazil and Indonesia hurting trade in transport services could be that their transport sector has not been opened. Individual-specific effects were also computed. The results indicate that China, India, and Singapore engage in higher trade in transport services than estimated by the model. Similarly, Brazil, Canada, Germany, Indonesia, and the USA have lower trade than estimated by the model. For travel services, the estimated R² is 0.95. The GDP per capita, population, number of internet users, number of mobile users, the remoteness of Brazil, and dummy variables for FTA with Brazil, China, Indonesia and Singapore, and year dummies are significant. The coefficient of GDP per capita is positive, so as incomes increase the trade for travel services will increase by about 240%. The dummy variables for FTA with Brazil and Indonesia

are significant with negative coefficients. In times when technology is at the tip of the finger, mobile phones and the internet have become inseparable. Hence, it is surprising that as the number of internet users increases the demand for travel services would fall. One would expect that as the number of internet users increases more and more people would use the internet to explore new places and possibly travel more. Remoteness for Brazil or Brazil's relative distance is also positive and signifies that as relative distance increases, trade in travel services would fall. The model estimates population to have a negative sign which is unusual, as an increase in population would increase demand for travel services. The trade in travel services is higher than estimated for China, India, and Indonesia and lower than estimated for Brazil, Canada, Germany, Singapore, and the USA. The R^2 for the telecommunications services is noted to be 0.803. The significant variables are remoteness of Brazil, the dummy variable for FTA with Brazil, and the time dummies. The trade in telecommunications services is higher for India, Indonesia, and the USA. It is found to be lower than estimated for Brazil, Canada, Germany, Singapore, and the USA. Next, the model is estimated for computer services. The R^2 for this is estimated at 0.912. The significant variables are GDP per capita, number of internet users, and the year dummies. The GDP per capita is positive as expected and is estimated to increase trade by 266%. It is also unusual that the number of internet users has a negative coefficient. The model estimates trade to be higher for China, India, and Indonesia. Likewise, it is lower for Brazil, Canada, Germany. The R^2 estimated for personal, cultural, and recreational services is 0.76. The GDP per capita, number of internet users, remoteness of Brazil, dummy variables for FTA with Brazil, Indonesia, Singapore, and the domestic output of personal, cultural, and recreational services are significant. An increase in the GDP per capita leads to an increase in trade in this sector by about 550%. Unusually, the number of internet users has a negative coefficient. It is expected that with the rise of internet services such as various streaming platforms for music and entertainment, an increase in the number of internet users would lead to an increase in trade in personal and recreational services. The dummy variable for FTA with Singapore has a negative coefficient, and high regulations in this sector could be the reason for this. The trade by India, Indonesia, and the USA is higher than that estimated by the model, and lower for Brazil, Canada, China, Germany, and Singapore. For commercial services, the R^2 is found to be 0.932. The variables of GDP per capita, number of internet users, dummy variables for FTA with China and India, and the time dummies are significant. The increase in GDP per capita facilitates an increase in trade by about 111%. An unexpected result of the negative coefficient of the number of internet users is observed. The trade in commercial services is higher for China, India, and the USA, and lower for Brazil, Canada, Germany, Indonesia, and Singapore. The R^2 for goods-related services is estimated to be 0.669. The significant variables are GDP per capita, population, number of internet users, the dummy variable for FTA with China, and time dummies. The increase in the number of internet users causes trade in goods-related services to increase by about 128%. The population is found to be negative. This could mean that over time the population does not affect the trade in commercial services. The GDP per capita has a negative coefficient. The trade in goods-related services is more than estimated for China, Germany, India, and the USA and lower than estimated for Brazil, Canada, Indonesia, and Singapore. Next, the model for total services is estimated. The R^2 is found to be 0.956. The GDP per capita has the expected positive sign on both models and increases trade by about 126%. However, the number of internet users has a negative sign. Though trade in services is increasingly being done via the internet, many services like construction services still require physical proximity. The remoteness of Brazil has a positive sign. Whereas dummy variables form FTAs with China has a positive coefficient. The time dummies also significant. Total services trade is found to be higher than estimated for China, India, and the USA. It is found to be lower than estimated for Brazil, Canada, India, Indonesia, and Singapore.

Next, the VECM model is estimated. The VECM model is estimated to understand the short-run and long-run causality between the independent and dependent variables. For the VECM estimation, first, the unit root test is conducted for all the variables. The panel data unit root test is conducted for this. All the variables are found to be stationary at the first difference. Next, the Pedroni Residual Cointegration Test is performed to check for cointegration in the model. It is found that there is cointegration for all the sectors. Hence, the VECM model can be applied. The estimated VECM gives the long and short-run causality for each of the service sectors.

It can be seen that there is no short-run or long causality between the trade of transport services and the GDP per capita, population, number of internet users, and number of mobile users. There is no short-run or long-run causality between the travel services and GDP per capita, population, number of internet users, and number of mobile users. In the telecommunications services sector, there is short-run causality; there is causality from the dependent variable, trade in telecommunications services, to the independent variables, GDP per capita, population, number of mobile users, and number of internet users. But there is no long-run causality. For trade in computer services, there is no short-run causality, but long-run causality exists. There is no causality, either in the short run or long run,

for the trade in personal, cultural, and recreational services and the dependent variables. The results show a long-run causality for the trade in commercial services but no short-run causality. A short-run and long-run causality are noted for the trade in goods-related services and the GDP per capita, population, number of internet users, and number of mobile users. No short-run causality is found for total services, but a long-run causality between the independent and dependent variables is present.

3 Conclusion

The primary purpose of this study was to understand the determinants of trade in services and their barriers. The results show that for the trade of transport services, travel services, computer services, and commercial services, the GDP per capita plays a significant role. This means that as the income of the sample countries' population increases, more and more of these services are traded. The number of internet users and mobile users impacts trade in travel services and computer services. The globalization of personal, cultural, and recreational services is boundless. The dissemination of these services via the internet has increased the variety of movies, tv shows, music, plays, etc. for the worldwide population. Hence, as the results suggest the GDP per capita, and the number of internet users are major factors propelling the trade of personal, cultural, and recreational services. The number of internet users is important for increasing the trade of commercial services. For the countries of China and Indonesia, being a part of FTA also plays a vital role in trading and possibly reducing the cost of transport services. The prevalence of on FTA agreement with Brazil, China, Indonesia, and Singapore impacts the trade of travel services, making it easier to trade this service. The results indicate that trading telecommunication services are easier when the sample countries are a part of a free trade agreement. The FTA variable enables the trading of goods-related services, as the results suggest. The results also show that there are similarities in which services are traded and the trade patterns for the developing countries of Brazil, China, India, and Indonesia. A similar pattern has also been noted among the Asian nations from the sample, with the exception of Singapore, as it is more developed than the other Asian countries from the sample and is highly dependent on services for sustenance. The developed nations of Canada and Germany also show similar patterns. Finally, the results are consistent with the literature that countries with higher incomes trade more services than those with lower incomes.

The role of services in an economy is proving to be more and more crucial due to the rapid technological changes. The role of trade openness is vital for trading services. Services are indispensable in the global value chains. As production is moving to a global scale, the services supporting them must also globalize.

4 Limitations

In the domain of services, lack of data availability is a major issue. The data available is sparse, and not many countries report the data for the service sector. The data for the variable $TRADE_{ijt}$ used in this study is calculated using the Balance of Payments Method (BOP6). The data for independent variables of STRI and DOMESTIC OUTPUT has been calculated using the ISIC Rev. 3 method. However, such data is not available in the BOP6 classification. The reason for using the BOP6 method is that it provides data for more service sectors as opposed to the ISIC Rev. 3 classification. Another issue faced during the study is the lack of data availability for the variables of SRTI and DOMESTIC OUTPUT. While the STRI has only been calculated from 2014 onwards, the Input-Output tables have been available until 2015. The variables of GDP per capita, population, number of mobile users, and number of internet users are used to estimate the causality. The model does not allow the relative distance, dummy variables for language, and dummy variables for FTA, as they create singular matrices.

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