International Trade Costs in Services

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June 15, 2014

Abstract

Extending the methodology of EK (2002) and Shikher (2011), this paper presents some of the first systematic evidence on the level of international trade costs in the services sector. The paper focuses on identifying and investigating the determinants of trade costs and presents a detailed analysis of trade costs for the total services sector, and 5 disaggregated service industries for 58 countries at different stages of economic development. Results show that the average incoming total services trade costs of the high income countries are much smaller than those of the upper middle and lower middle income countries. Distance and the import barriers (destination effect) have increasing effects on total services trade costs, common language and common border coefficients display decreasing effects. Also, the upper middle and lower middle income countries are far more restricted in context of services trade.

JEL codes: F1, F11, F14, F23

Keywords: international trade, trade costs, trade in services, trade policy

1. Introduction

The term services covers a wide range of intangible and heterogeneous products and activities. In contrast to goods, services are invisible and perishable, and usually require simultaneous production and consumption. Services include activities as disparate as transport of goods and

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people, telecommunication, construction, financial services, wholesale and retail distribution, hotel and catering, insurance, real estate, health and education, professional, marketing and other business support activities. Services are the largest sector in the global economy and their importance is expected to continue to grow. Services account for approximately two thirds of world GDP and over half of total employment in industrialized countries (World Bank, WDI database).

This widespread dominance of the services sector in the global economy is driven by a number of factors, including the final demand factor and also intermediate demand factor propelled by various structural changes in the process of production linked to development. In addition, recent advances in information and communication technologies are increasingly facilitating cross-border trade in services. The competitiveness of manufacturing firms in an open economy is largely determined by access to low cost and high quality producer services like telecommunications, transport and distribution services, financial intermediation, etc.

World exports of commercial services were US$ 3,350 billion in 2009, after growing an average of 7.9 percent per year since 1980. Trade in commercial services grew faster than trade in goods (6.6 percent on average) during this period. In 2009, the share of services sector in world trade reached 22 percent. However, the share of services rises to almost 50 percent if transactions are measured in terms of direct value added content.[1] Accounting for the value added by services in the production of goods data shows that the services sector contributes over 50% of total exports

[1] In GDP accounts, "value added" is gross output less intermediate inputs. From the trade perspective, national value added is the value of national work performed (i.e., the contribution of all national factors of production) in a country's exports, thus excluding the contribution made by component production in other countries (Benedetto, 2012). For example, if a Korean company imports $20 of inputs from Japan, assembles those parts in Korea, and exports the final product to the United States for $25, then Korean output and reported exports are $25, but Korean value-added exports are only $5.

in the United States, United Kingdom, France, Germany and Italy and nearly one-third in China (OECD-WTO trade in value-added database).

It is also worth highlighting that the developing countries in particular have witnessed high growth rates of services trade. Their share in world services exports increased from 14 percent in 1985–89 to nearly 20 percent in 1998–2002 (IMF Balance of Payments Statistics). The data shows that the business services[2] exports of the European Union and the United States have grown at 6 and 11 percent per annum respectively in the second half of the 1990s, the exports of countries like India, Israel, Mauritius and Brazil have grown at rates above 20 percent per annum.

Despite the increasing prominence of international trade in services, very little is known about the incidence of trade costs for services. This is mainly because the analysis of services trade flows as well as barriers to services trade have been hampered by severe data shortcomings, both in terms of quality and quantity. Services trade data is poorly measured and suffer from many missing values. Also, the problems of missing or of poor quality data are even more pronounced for services domestic output data. In this paper, however, I present some of the first systematic evidence on the level of trade costs in services sector. This paper examines the bilateral trade costs from a broad perspective in terms of country and industry coverage.

The paper focuses on identifying and investigating the determinants of trade costs in service industries such as travel, construction, financial, telecommunication and transportation. By studying various costs associated with trade of services, I estimate trade costs using a gravity-like equation derived from Shikher (2011), which is a framework based on the EK model (Eaton and

[2] The ''Business Services'' category includes Total Services minus Transportation, Travel and Government Services. Alternatively, Business Services consist of: Communication, Construction, Insurance, Financial, Computer & info, other business, Personal, cultural and recreational services, as well as Royalties and license fees.

Kortum, 2002). I present a detailed analysis of trade costs for the total services sector, and 5 services industries for 58 countries at different stages of economic development.

It is important to understand barriers to services trade because they are welfare-reducing. Reducing trade barriers would increase trade, income, and welfare (at least in the long run; in the short run adjustment costs may outweigh the benefits). Because of the effects of trade barriers on international trade, a better understanding of international economy necessitates the careful measurement of trade costs. International trade costs are all the costs associated with the exchange of a good or service across international borders. These costs include transportation costs, insurance, tariff and non-tariff policy barriers, information costs, costs arising from use of different currencies or different languages, among others (Anderson and van Wincoop, 2004).

The economic importance of trade costs lies in their impact on economic welfare, pattern of trade, and specialization in production. Trade costs differ across country pairs and across industries; hence they influence comparative advantage by affecting the relative cost of one country's service product in another.

Most of the literature on international trade that has accumulated over the past years has dealt with trade in goods. For OECD countries using a gravity based equation ad valorem tax equivalent of total trade costs in goods is about 170% (Anderson and van Wincoop, 2004). Another study is Novy (2009). In that paper, the author uses a gravity equation to measure the U.S. bilateral trade costs relative to the domestic trade costs, and shows that the U.S. trade costs declined by 40% during the period 1970-2000 with Mexico and Canada experiencing the biggest reductions.

The existing literature on the application of the gravity model to services trade is absolutely limited. One of the few papers on the subject is Ceglowski (2006). Her paper estimates gravity

equation for bilateral services trade for a sample of 28 countries. She finds that the standard gravity variables of economic size and geographic proximity are significant factors in services trade. The paper also reveals positive effects of linguistic ties on services trade. There is evidence of a positive link between regional trade arrangements and services trade.

Walsh (2006) also assesses the determinants of trade in services using a gravity model. Using the data of 27 OECD countries he concludes that the gravity model fits services trade flows in a similar manner to trade in goods. Wealth of countries and a common language are the most important determinants of services trade, distance is generally found to be insignificant. He also estimated the tariff equivalents of the barriers to trade flows between each bilateral trading pair of countries. The average tariff equivalents range from 0 to 125 per cent, with a mean of 72 per cent. His study shows that the Netherlands, Belgium-Luxembourg and the UK have low or zero tariff equivalents, while Austria, Italy and Greece have relatively high barriers (74, 75 and 84 per cent respectively).

Shepherd et al (2010) use a theory based methodology similar to Novy (2009) to estimate international trade costs in services. They compared trade costs of major trading economies vis-à-vis the rest of the world and concluded that trade costs are much higher in the services sector than in goods–about double, on average. The absolute levels of trade costs in services are very high: over 100% in all cases, and over 200% for India. As per their estimation on a world aggregate basis, trade costs in goods have declined by more than 15% over the last ten years. The same is by no means true for services: trade costs have barely moved over the last decade, and if anything, it has slightly increased. They measured trade costs in services for 61 countries and 12 services sectors however, the data at this level of detail is only available for a subset of countries thus they have used an aggregate version of the data. Also in case of services the output data of many countries is unreliable and/or relatively unavailable.

Relative to the above studies, this paper examines the bilateral trade costs from a broad perspective in terms of country coverage, industry coverage, and answers the following questions:

i. What is the absolute level of ad-valorem equivalents of international bilateral trade cost in the total services sector?
ii. What is the difference between the services trade costs of High income, Upper middle income and Lower middle income countries?
iii. What is the level of total services trade costs compared to the trade costs in the manufacturing sector?
iv. Which determinants of trade costs cause the differences in trade barriers across countries, and across industries?

In order to answer these questions, I estimate trade costs using a gravity-like equation derived from Shikher (2011), which is a framework based on the EK model (Eaton and Kortum, 2002) at the industry level. Instead of using the Armington (1969) assumption to explain intra-industry trade, the model allows producer heterogeneity. Therefore, the goods are differentiated according to their features, rather than their country of origin. Moreover, in the case of producer heterogeneity, countries do not have monopoly power, and home bias in consumption and price difference across countries are explained by trade costs rather than demand-side parameters.

The rest of the paper is organized as follows. Section 2 briefly describes international trade in total services and five disaggregated service industries. Section 3 describes the methodology used in the paper. Section 4 describes the scope and the sources of the data. Section 5 presents the empirical results of the study for total services sector and disaggregated service industries and Section 6 concludes.

2. International Trade in Services

International trade in services takes place between a producer and consumer that are, in legal terms, based in different countries. Trade in services is defined by the Four Modes of Supply of the General Agreement on Trade in Services (GATS).

- Cross-border (mode 1): services supplied from the territory of one Member into the territory of another. An example is banking services provided by a supplier in one country through mail or electronic means to consumers in another country.

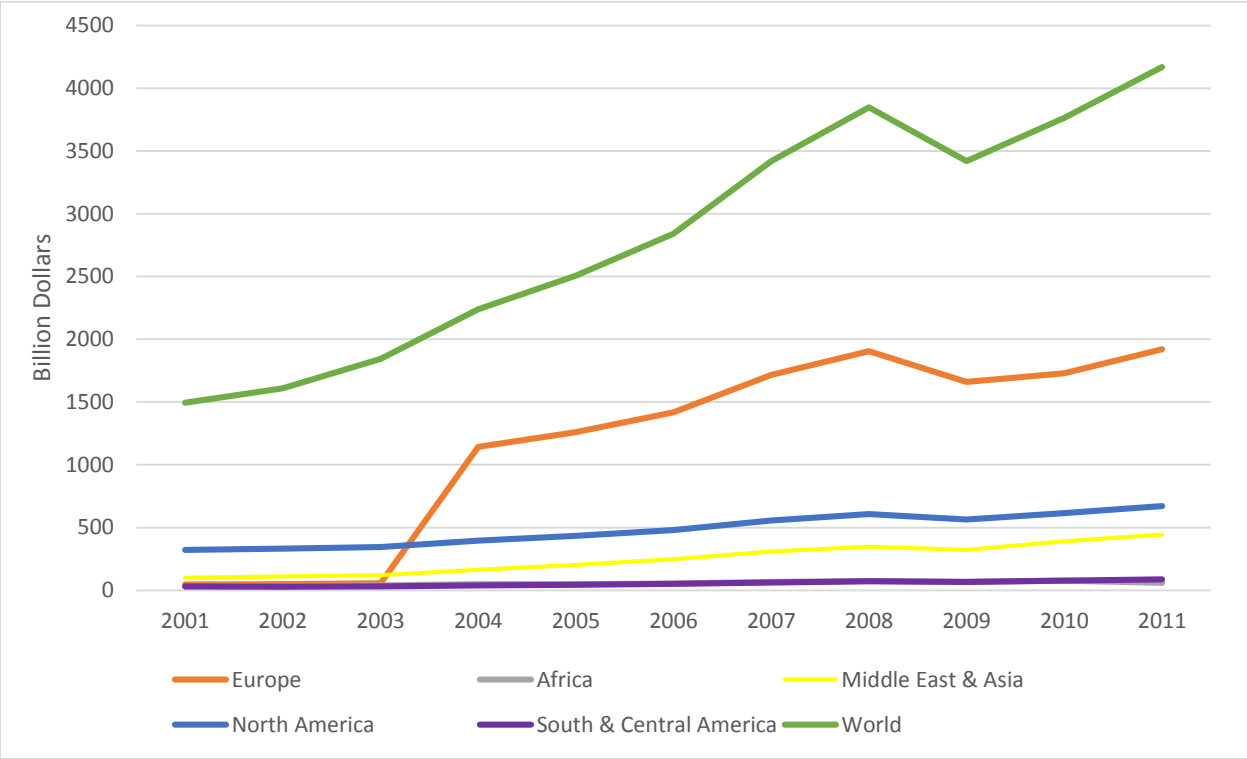
- Consumption abroad (mode 2): services supplied in the territory of one Member to the consumers of another. Examples are where the consumer moves, e.g. to consume tourism or education services in another country. Also covered are activities such as ship-repair abroad, where only the property of the consumer moves.

- Commercial presence (mode 3): services supplied through any type of business or professional establishment of one Member in the territory of another. An example is medical services provided by a foreign-owned hospital.

- Presence of natural persons (mode 4): services supplied by nationals of one Member in the territory of another. This mode includes both independent service suppliers and employees of the services supplier of another Member. Examples are a doctor of one country supplying through his physical presence services in another country, or a professor of a foreign university providing services on a temporary basis.

Figure 1 shows exports of commercial services[3] by various groups of economies from 2001-2011. World exports of commercial services in 2011 reached $4,169 billion. From figure 1, Europe exported the maximum amount of commercial services in the past decade. Also, the amount of commercial services exports by Africa and South and Central America are very similar during this time period thus the two curves coincide with each other in the figure 1.

Figure 1: Exports of commercial services by selected groups of economies, 2001-2011



Source: WTO, international trade statistics 2012

Balance of payments (BOP) summarize transactions of an economy with the rest of the world into the components of the current account and the capital and financial account. BOP statistics under

[3] Commercial services do not include government services

the 6th edition of the IMF Balance of Payments Manual (BPM6) display data on trade in services between residents and non-residents within the current account. BOP statistics however, do not allow a comprehensive measurement of services delivered through Mode 3. It provides supplementary indicators like Foreign Direct Investment (FDI) statistics and Foreign Affiliates Statistics (FATS). BOP statistics include data of 12 disaggregated services industries. Table 1 shows the services classification as per BPM6.

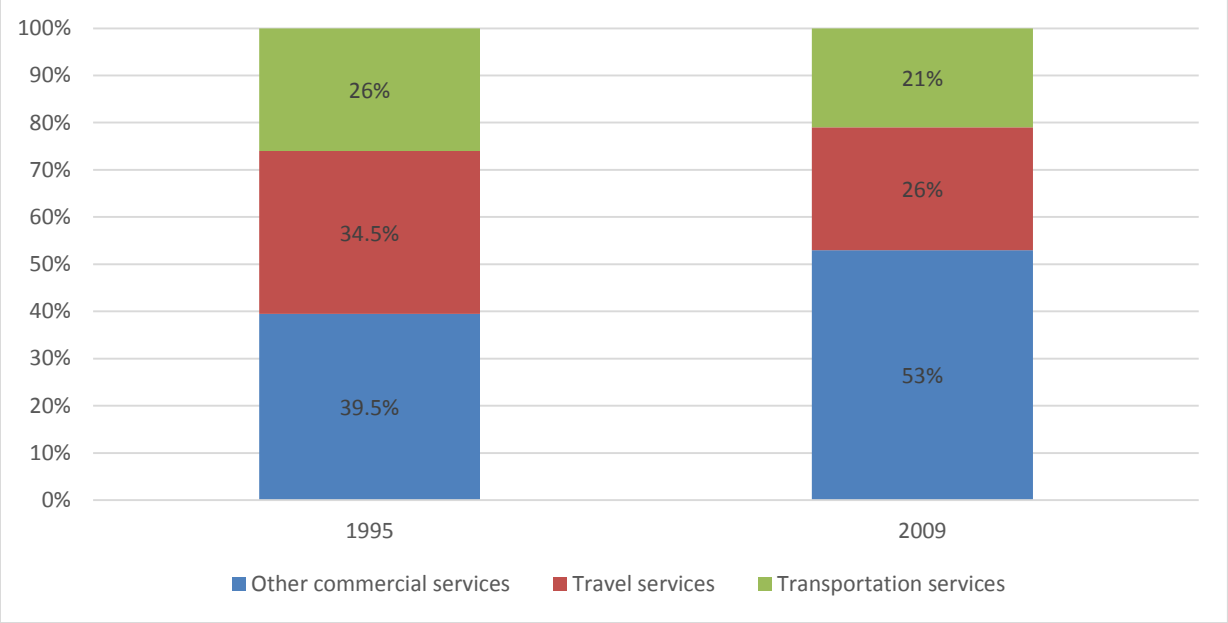
Table 1: Classification of services as per the 6th edition of the IMF Balance of Payments Manual

Disaggregated services industries	
1. Manufacturing services on physical inputs owned by others	7. Telecommunications, computer, and information services
2. Maintenance and repair services	8. Charges for the use of intellectual property
3. Transportation services	9. Financial services
4. Travel services	10. Other business services
5. Construction services	11. Personal, cultural and recreational services
6. Insurance and pension services	12. Government services

Over the past years there has been a significant change in the structure of services traded. Among others, the communication revolution and digitalization eliminated major obstacles to the international delivery of a number of services by providing new means of supplying them remotely. Figure 2 shows the changes in the breakdown of world trade in commercial services, from 1995-2009. It can be seen in figure 2 that since 1995 the share of other commercial services

in total trade in services has increased by a 13.5-percentage-point in to 53 percent in 2009, mostly at the expense of travel which lost 8.5 points, down to 26 percent. In 2009, transportation accounted for 21% of commercial services exports (down by 5%).

Figure 2: Changes in the breakdown of world trade in commercial services, 1995-2009

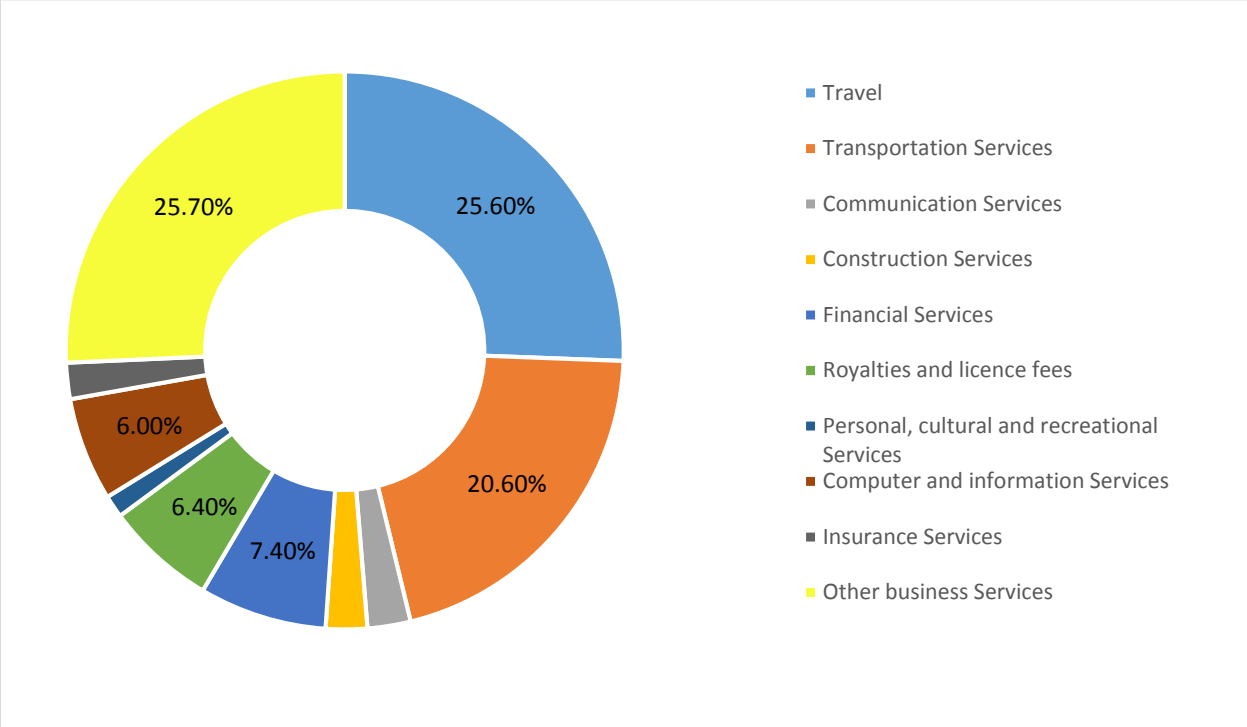


Source: WTO database.

Next we will see the share of various disaggregated services industries in total exports of commercial services. From figure 3, it can be clearly seen that half of world exports of commercial services consisted of travel receipts and other business services in 2011. These other business services include research and development services, professional and management consulting services (legal services; accounting, auditing; business and management consulting and public relations services; advertising); and technical, trade-related and other business services

(architectural, engineering, waste treatment and de-pollution, agriculture, mining; operational leasing services; and trade-related services).

Figure 3: Share in total exports of commercial services, 2011



Source: adapted from WTO international trade statistics 2012

Transportation services accounted for 20.6 per cent. Exports of financial services represented 7.4 per cent of global exports of commercial services in 2011, followed by royalties and license fees with 6.4 per cent. Computer and information services accounted for 6.0 per cent of world exports of commercial services (figure 3). Other sectors had a much smaller share in commercial services exports. Insurance services, construction and communications services accounted for between 2.1 per cent and 2.5 per cent in 2011. Personal cultural and recreational services, which include audio-visual services, had the smallest share with 1.3 per cent of global commercial services exports.

In this paper I've estimated the trade costs of 5 services industries. Since in order to estimate the trade costs we need data on both bilateral trade and also domestic output data thus, the data requirement limits the number of service industries for which I can estimate the trade costs. Also for many service industries if bilateral trade data is available, the data on domestic output is missing. This is true especially in the case of many poor countries. The 5 service industries for which the trade costs are estimated and analyzed are:

i. **Transportation Services**: It covers all transport services performed by residents of one economy for those of another. It involve carriage of passengers, movement of goods (freight), rentals (charters) of carriers with crew, related supporting and auxiliary services.

ii. **Financial and Insurance services**: It covers financial intermediation and auxiliary services, provided by banks, stock exchanges, factoring enterprises, credit card enterprises etc. It also covers the provision of various types of insurance and pension services.

iii. **Construction services**: It covers work performed on construction projects and installation by employees of an enterprise in locations outside the territory of residence of an enterprise.

iv. **Telecommunications, computer and information services** are subdivided into telecommunications services, computer services (of which computer software), news agency services (provision of news, photographs, and feature articles to the media), and other information services (database services and web search portals).

v. **Travel Services***:* It does not refer to a particular product and covers expenses for goods and services (including accommodation, food, souvenirs, etc.) acquired by a person during his/her visit in a country other than his/her own.

International trade costs in services are different from trade costs in goods. When an agricultural or manufacturing good is imported into a country, the most common form of protection imposed is a tariff. The level of a tariff is usually known and its impact on the price of the good can be estimated. This is in sharp contrast with the service sector products. A commercial bank wishing to establish a branch in another country or a doctor hoping to set up a practice in a foreign country cannot simply pay a tariff and establish their business. Trade in services such as these typically requires the movement of people and capital between countries. In most countries there exist a range of legal and regulatory requirements that must be satisfied before the establishment of such services.

The regulatory regimes pertaining to (temporary) movement of people (visa restrictions; economic needs tests) and longer-term establishment of service suppliers are important determinants of the feasibility of trade in services. Regulatory costs are extensive across wide range of services and they imply high fixed costs.

Also, because services are not storable, their exchange frequently requires the proximity of supplier and consumer – providers must move to the location of the buyer/consumer of a service, or vice versa. Given the need for proximity in exchange, factors like distance put a cost burden on certain forms of services delivery. This is the proximity burden (Francois and Hoekman, 2010). The significance of the proximity constraint for service transactions means that language also plays a key role in case of trade in services. Hence, costs associated with the use of different languages are also substantial in various service industries.

3. Methodology

The methodology comes from EK (2002) and Shikher (2011). There are N countries, indexed by i and n and J industries indexed by j and m.

Bernard et al. (2003), and Eaton et al. (2004) refer to the existence of productivity differences across producers. Following this evidence, the model imposes the assumption that within each services industry there is a continuum of service products, with each product having its own productivity in manufacturing. Indexing products by $l \in [0,1]$ the productivity of producing product *l* of industry j at country n at time t is denoted by $z_{nj}(l)$. Productivities are the result of R&D process, and drawn independently from the Fréchet distribution which has the cdf $F_{ij}(z) = e^{-T_{ij}z^{-\theta}}$ with parameters $T_{ij} > 0$ and $\theta > 0$. Note that, it is reasonable to use an extreme value distribution for technology since every country uses the best production technique available to it[4].

C_{ij} is the cost of the bundle of inputs in country i, industry j, and $d_{nij} > 1$ is the iceberg trade cost of shipping 1 unit of industry j service product from country i to country n (by definition $d_{ii} = 1$). Hence, the price of service product *l* of industry j delivered from country i to country n is $p_{nij}(l) = C_{ij}d_{nij}/z_{nj}(l)$. However, the consumers buy the services from the lowest-price supplier. By maximizing the CES utility function, the ideal consumer price index for industry j service products, produced in country i, and delivered to country n can be derived as:

$$p_{nj} = \gamma \left[\sum_i T_{ij} \left(d_{nij}C_{ij}\right)^{-\theta}\right]^{-1/\theta}, \qquad (1)$$

[4]Kortum, (1997), Eaton and Kortum, (1999) show how a process of innovation and diffusion can give rise to Fréchet distribution.

where T_{ij} is the average productivity of industry j producers at country i , θ is a parameter that determines the comparative advantage across various service products within an industry, and γ is a constant.

The probability of a producer from country i being the lowest-price supplier in country n for good *l* of industry j is $\pi_{nij} = \Pr\left[p_{nij}(l) \leq min\{p_{nsj}(l); s \neq i\}\right] = T_{ij}\left(\gamma C_{ij} d_{nij}/p_{nj}\right)^{-\theta}$. This is also the fraction of n's spending on industry j service products from country i. So, the industry level bilateral trade can be written as:

$$\pi_{nij} \equiv \frac{X_{nij}}{X_{nj}} \equiv T_{ij}\left(\frac{\gamma d_{nij} C_{ij}}{p_{nj}}\right)^{-\theta}, \qquad (2)$$

where X_{nij} is the spending of country n on industry j service products imported from country i, and X_{nj} is the total spending in country n on industry j service products.

3.1. Trade Costs

The ratio of country n's imports from country i to its domestic imports for industry j service products is:

$$\frac{\pi_{nij}}{\pi_{nnj}} = \frac{X_{nij}}{X_{nnj}} = \frac{T_{ij}}{T_{nj}}\left(\frac{d_{nij}\, c_{ij}}{c_{nj}}\right)^{-\theta}, \qquad (3)$$

Defining $B_{ij} = T_{ijC_{ij}}$-θ as an international competitiveness measure for industry j of country i, the theoretically derived gravity-like equation is obtained:

$$ln \frac{X_{nij}}{X_{nnj}} = - \theta \, ln \, d_{nij} + ln \, B_{ij} - ln \, B_{nj} \, , \qquad (4)$$

The left-hand side of (4) is the log of the trade ratio of imports from country i to country n on industry j, X_{nij} to imports from home on industry j, X_{nnj} (which is calculated as output minus exports): On the right-hand side of the equation, d_{nij} is the iceberg trade cost, and θ is a model parameter.

The trade barrier d_{nij} is measured relative to the domestic trade cost. Hence, the estimated trade costs should be interpreted as the extent to which international trade is more costly than domestic trade. Therefore, the trade cost function includes proxies for various sources of international trade costs that affect the relative price of domestic and imported goods, such as shared language, adjacency, distance, costs associated with use of different currencies and costs associated with import tariffs and regulatory barriers as explanatory variable. These variables are the most common explanatory variables that are used in case of modelling goods trade and they turn out to be significant in most cases.

Using the many same explanatory variables to model services trade costs may make sense, since even in case of services factors like distance between the trading economies, linguistic and cultural ties, various regional trade agreements between the trading partners and regulatory environment in the country are major determinants of trade in services.

The log iceberg trade costs are estimated using the trade cost function that relates unobservable trade costs to observable country characteristics[5]:

$$\ln d_{nij} = d_{kj}^{phys} + l_j + b_j + f_j + c_j + m_{nj} + \delta_{nij} , \qquad (5)$$

Following Shikher (2011) and EK (2002), the distance between i and n is divided into six intervals (in km): [0; 375); [375; 750); [750; 1500); [1500; 3000); [3000; 6000), and [6000; max), and d_{kj}^{phys} is the effect of the physical distance in the k_{th} interval (k = 1,…., 6). b_j and l_j are the effects of having a common border, and common language, respectively. f_j is the effect of belonging to the same free trade area (FTA), m_{nj} is the overall destination effect, and δ_{nij} is the sum of the trade costs arising from all other factors, or the error term.

Taking the logs of both sides of equation (3) and plugging in the trade cost function (5), the estimating equation is derived as:

$$\ln \frac{X_{nij}}{X_{nnj}} = -\theta\, d_{kj}^{phys} - \theta l_j - \theta\, b_j - \theta\, f_j - \theta\, c_j + D_{nj}^{imp} + D_{ij}^{exp} - \theta\, \delta_{nij} \qquad (6)$$

which is estimated by generalized least square independently, where $D_{ij}^{exp} = \ln B_{ij} = \ln T_{ij} C_{ij}^{-\theta}$ is the exporter dummy and $D_{nj}^{imp} = -\theta\, m_{nj} - lnB_{nj} = -\theta\, m_{nj} - lnT_{nj} C_{nj}^{-\theta}$, is the importer dummy.

[5] By definition d_{iij} = 1, hence the estimation is necessary only for non-domestic transport costs.

The destination-industry specific import barrier is calculated as $m_{nj} = -\left(\frac{1}{\theta}\right)(D_{nj}^{exp} + D_{nj}^{imp})$. The regression coefficients for importer and exporter dummies for the U.S. are normalized to 0, i.e $D_{U.S\ j}^{exp} = D_{U.S\ j}^{imp} = 0$, hence m_{nj}'s are relative to the U.S.

4. Data

In order to estimate equation (6), data on output, bilateral trade, and gravity variables are necessary. Output data comes from the OECD's STAN database which provides data as per ISIC Rev.3 classification. However, since the country coverage of the OECD database remains limited to OECD and EU countries, I have also used UN's National Accounts Official Country Data. This source provides data for several emerging and developing economies. Also, for major Asian economies like India, China, and Indonesia data come from the OECD's set of IO tables which provide detailed sector-level gross output using an ISIC Rev.3-compatible classification. Gross output data from UN's National Accounts database is expressed in millions of local currency and at basic prices. A prior conversion into USD is therefore required if we are to combine them with trade data and get a measure of trade costs that is comparable across countries. This is done using bilateral nominal exchange rates from the IMF's International Financial Statistics database (market rates, period average).

The bilateral services trade data comes from the UN's Service Trade database. The UN services trade data is broken down by EBOPS category and partner country. Now since, the output data is reported as per the ISIC classification in order to estimate the gravity model, the output data needs to be concorded to the trade classification for services. I have done the concordance based on the "Correspondence between ISIC Categories for Foreign Affiliates (ICFA) and Extended Balance

of Payments Services Classification (EBOPS)" as published in Annex IV of the UN's Manual on Statistics of International Trade in Services.

The data on trade impediment variables (distance, common border, common language, common currency, regional trade agreements) come from the Gravity Database compiled by CEPII, and θ is set to 8.28 following Eaton and Kortum (2002).

5. Results

5.1. Estimated trade costs in the total services sector

Estimating equation 6 yielded the average bilateral incoming total services trade costs across all country pairs in the sample: 4.5.[6] This number represents the (dollar) amount of service product in industry j that needs to be sent from country i in order to receive $1 of the service product in country n. Thus the ad-valorem tariff equivalent is 350 percent in case of total services. There are large variations in the level of total services trade costs across countries. The lowest incoming trade cost is 1.54[7] (UK) and the highest incoming trade cost is 32.44 (Venezuela).

Netherlands, Germany, Denmark, France, Hong Kong, Italy are countries with relatively low trade costs. On the other hand, Russia, Malta, Philippines, Nigeria are countries with very high trade costs.

The dataset allows me to analyze trade costs across various countries at different income levels. Since, there are wide variations in the level of trade costs across all countries, in order to explore

[6] In calculation of the averages the outliers have been dropped.

[7] Trade costs are calculated as $d_{nij} = e^{d_{kj}^{phys}} . e^{b_j} . e^{l_j} . e^{f_j} . e^{c_j} . e^{m_{nj}} . e^{\delta_{nij}}$ from equation (5).

these cross-country differences in detail, I have divided the sample countries into High income, Upper middle income and Lower middle income country groups.[8]

Table 2: Average total services trade costs for high, upper middle and lower middle income countries

Income Group	Mean	Range		Number of countries
All countries	4.5*	Min:1.54	Max:32.45	58
High income	2.19*	Min:1.54	Max:10.8	33
Upper middle income	6.55*	Min:2.3	Max:32.45	16
Lower middle income	8.83*	Min:3.8	Max:22.4	9

*in calculation of the averages the outliers have been dropped.

Table 2 shows mean and the minimum and maximum value of the importer's trade cost for the average of high income, upper middle income and lower middle income countries for the year 2005. (For example, the mean of high income countries is calculated as: $d_{High\ Inc} = (1/N_{High\ Inc})\Sigma d_{ni}$, where $N_{High\ Inc}$is the number of high income countries). The first thing to note from table 2 is that the average incoming total services trade costs of the high income countries are much smaller than those of the upper middle and lower middle income countries. This result

[8] Table A1 shows high, upper middle and lower middle income country classifications

can be partly explained by the fact that the majority of the high income countries are EU countries; therefore, they are geographically (distance, common border) and economically (free trade agreements, currency union, etc.) tied together, which makes trade costs smaller.

The average incoming total services trade cost for high income countries is 2.19. In this country group Iceland, Slovakia, Slovenia are the countries with high trade costs around 3.1. Malta is the only high income country with very high trade costs of 10.8. The average trade costs of the upper middle income countries is 6.55 (table 2). For this income group there is large amount of heterogeneity among countries. Countries like China, Turkey, Bulgaria have relatively low trade costs around 2.5. Countries like Belarus, Lithuania, Iran have high trade costs around 4.5. Countries like Latvia, Russia, Venezuela have very high trade costs. High international trade costs of the upper middle and lower middle income countries can be explained by the fact that most of these countries are developing countries. Developing countries have higher tariff levels and more restrictive trade policies as compared to developed countries (Kee et.al., 2009).

Overall, it can be stated that: $d_{Upper\ \&\ lower\ middle\ inc} > d_{High\ inc}$.

5.2. Comparison of trade costs in goods and services

Table 3 compares USA importer's trade costs in goods with importer's trade costs in services vis-à-vis its major trading partners. In order to compare the trade costs in the two sectors I'm using the results reported in Novy (2009). Now, here I'm presenting results in terms of ad-valorem equivalents.

It can be clearly seen from table 3 that the level of incoming trade costs is higher in services sectors than in goods for US with all it's major trading partners. This result is not surprising since one would expect higher trade costs in the services sector because trade in services involve a lot more legal and regulatory requirements as compare to trade in goods. This is mainly because services trade involve movement of both goods and human capital. However, the standout result from table 3 is that services trade costs are not abnormally very high. The table also shows the simple average (calculated for the given trading partners only) of U.S. importer's trade costs. It can be clearly seen that for U.S. the average incoming trade costs for the services sector is only about double as compared to incoming trade costs in goods.

It is worth highlighting that even between markets that are very far off geographically and culturally- the US and Japan or Korea –there are trade costs in services of only around 115 percent compare to around 100 percent with Canada with is closest to US.

Table 3: Comparison of trade costs in goods and services, USA vis-à-vis major partners

Partner	**Goods(Novy)**	**Services**
Canada	25%	97%
Germany	70%	117%
Japan	65%	112%
Korea	70%	115%
Mexico	33%	69%
UK	63%	101%
Simple Average	**54%**	**102%**

5.3. Rich countries trade costs are smaller than Poor countries'

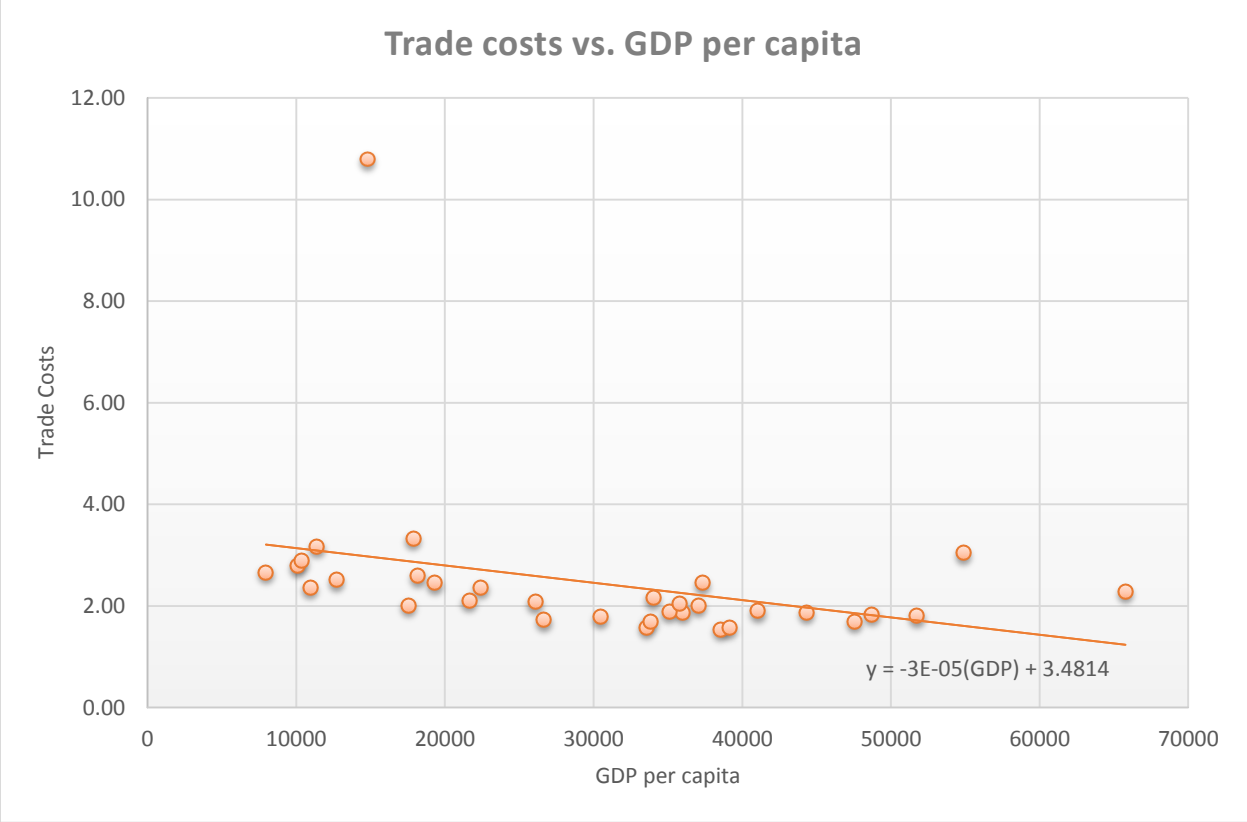
Since numerous reviews of trade literature have found a fairly consistent pattern: trade indeed is a key factor in promoting economic growth (see, for example, Noguer and Siscart (2005): they took careful account of geography along with other factors, and concluded that a 1% increase in openness was associated with a 1% increase in per capita incomes) it will be interesting to examine the relationship between income level and trade costs. This is especially important from the poor countries perspective and their relations with industrialized countries.

Figure 4 shows the relationship between incoming trade costs of the total services sector for each high income country (calculated as simple average with all the trading partners) and GDP per capita of the countries for the year 2005. The results display a negative relationship and the figure confirms that for high income group countries the total services sector trade costs decline as the GDP per capita increases. The figure however, also shows three outlier observations. Among all the high income group countries Malta, Iceland and Norway are the countries which have high trade costs of 10.80, 3.04 and 2.29 respectively along with high GDP per capita ($15,000, $55,000 and $65,000 respectively).

Figure 5 shows the relationship between incoming trade costs of the total services sector for each upper middle income and lower middle income country (calculated as simple average with all the trading partners) and GDP per capita of the countries for the year 2005. Now, it can be clearly seen from the figure that the trade costs of these countries are extremely high. There are countries like Kyrgyzstan, China and Ukraine which have low trade costs of 3.94, 2.3 and 4.5 respectively along with low GDP per capita ($476, $1731 and $1829 respectively). On the other hand, there are countries like Venezuela, Latvia and Russia with very high trade costs of 32.45, 28.43 and 10.67 respectively along with relatively high GDP per capita ($5444, $6973 and $5337

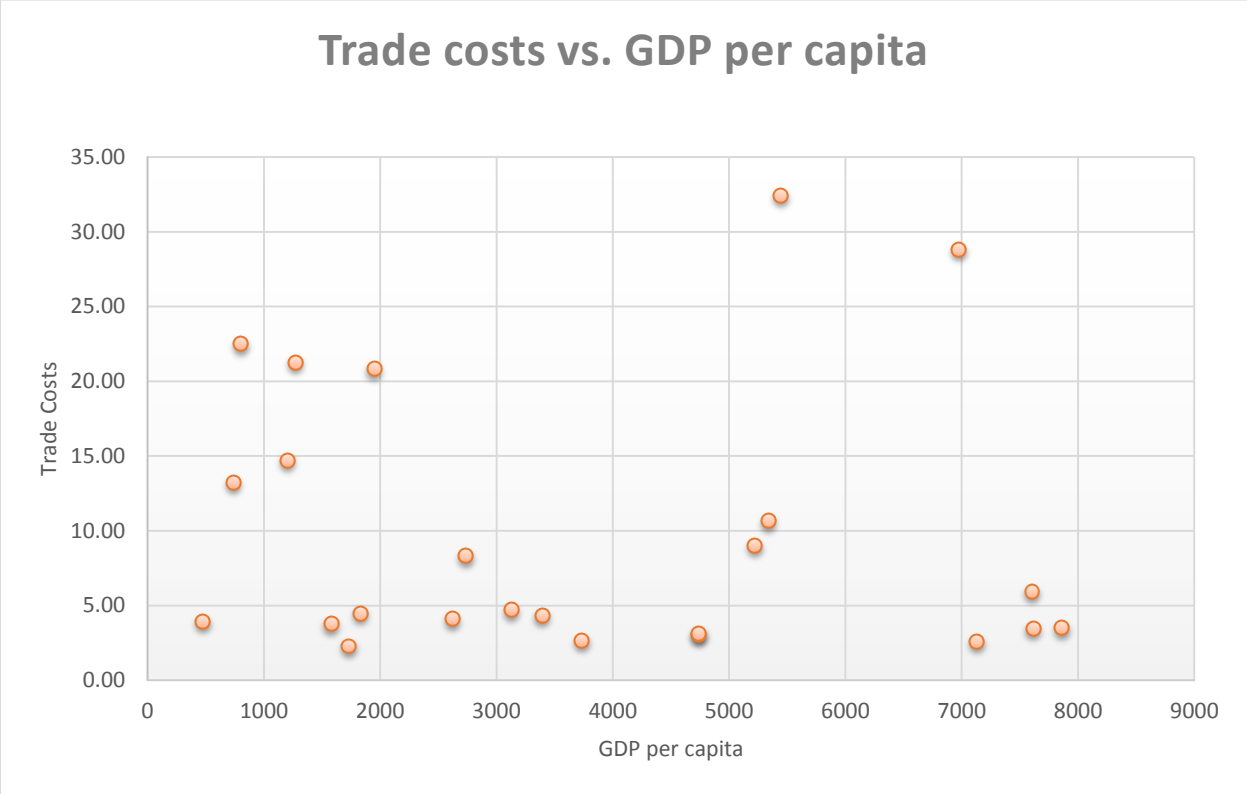
respectively). Also, there are few countries like Turkey, Bulgaria, Brazil and Argentina which have low trade costs that are comparable with many high income countries (2.62, 2.68, 3.07 and 3.11 respectively).

Figure 4: High Income Countries



Source of GDP per capita: World Bank

Figure 5: Upper middle income and Lower middle income Countries



Source of GDP per capita: World Bank

5.4. The determinants of Trade Costs

Note that trade costs are calculated as $d_{nij} = e^{d_{kj}^{phys}} . e^{b_j} . e^{l_j} . e^{f_j} . e^{c_j} . e^{m_{nj}} . e^{\delta_{nij}}$ from equation (5). Therefore, an exponential value of greater than 1 shows an increasing effect of the corresponding country characteristic on trade costs, while a value smaller than 1 shows a decreasing effect.[9] In order to analyze the marginal effect of each determinant, I calculate the

[9]Except the distance effects, since the distance results are relative to the distance category "375 km or lower" d^{phys}, bj, lj, fj, and cj values are derived by dividing the estimated regression coefficients of equation (6) by θ = -8.28.

exponential values of d_{kj}^{phys}, b_j, l_j and so on. Table 4 summarizes these marginal effects for j = total services sector.

First, and not surprisingly, Table 4 indicates that distance have increasing effects on services trade costs, and the farther the distance between the trading countries, the higher the trade cost. It makes absolute sense since in case of many services either the consumer or the service provider has to move to the location where the service is rendered. Values indicate that the effect of distance (6000 km or higher) increases trade cost by 91% relative to the distance category "375 km or lower". Common language and common border coefficients display decreasing effects, and lower the services trade costs by 10% and 12%, respectively. FTA, on the other hand, shows an unexpected result and raises the trade costs between the signatory countries by 1%. This result contradicts with the general assumption of trade cost diminishing (hence trade boosting) effect of FTAs among the member countries. However, besides decreasing the tariffs, FTAs can increase the regulations, which might result in a rise at the overall trade costs. In the case of manufacturing the literature on the gravity equation of trade supports this idea by showing that FTAs do not always increase the trade among members: Sapir (2001) and Bayoumi and Eichengreen (1997) show negative effect of these agreements on the member's trade by employing gravity model with the data from the 1960s to the 1990s. They show especially European Commission first enlargement has a negative effect on trade among the UK, Denmark, and Ireland.

Also, surprisingly having a common currency raises the services trade cost by 7%. In this paper I think this is the EU effect which is being picked up as European countries are the only countries in my sample which have a common currency. Now, a key point to note here is that in this section we are analyzing the effect of these determinants on total services sector. The effect of each determinant will vary once we study disaggregated services industries. For instance distance will

greatly effect trade costs in case of transportation services, where as in case of financial services distance will not highly increase the trade costs as financial services can be easily electronically traded.

Table 4 also shows the values of these determinants in case of manufacturing trade costs. I'm using the results reported in Yaylaci (2013) in order to compare the effects of various determinants on services trade costs and manufacturing trade costs. In case of the total manufacturing sector the distance (6000 km or higher, d6) increases trade cost by only 52 percent where as in the services sector it increases the trade cost by 91 percent. This clearly shows that the transportation costs in case of services are much higher than manufacturing transportation costs. Also, in case the two countries share a common border the manufacturing trade costs are reduced by only 9 percent but in case of services sharing a common border i.e. being culturally close reduces the trade costs by 12 percent.

Table 4: Effects of the determinants of trade costs for total services sector and total manufacturing sector

Determinant	Services	Manufacturing
d1	1	1
d2	1.22	1.14
d3	1.33	1.19
d4	1.43	1.23
d5	1.62	1.35
d6	1.91	1.52
Border	0.88	0.91
lang	0.90	0.89
Fta	1.01	0.96
Currency	1.07	n.a.

For the purpose of analyzing the determinants of importer's trade costs for the total services sector, I have also estimated import barriers m_{nj} for each country in the sample. The average estimates are reported in Table 5. Note that the import barrier effect m_{nj} is country specific, and relative to the U.S. Table 5 shows the average import barrier of all countries other than the U.S. is 1.64. This value indicates that on an average import barriers in all the countries in the sample are 64 percent higher than U.S. and they increase the incoming trade costs in the total services sector by 64 percent. For the high income countries, the average value (calculated as $m_j = (1/N_{high\ inc})\Sigma m_{nj}$, where j = total services sector) indicates that the destination trade barriers increases the trade costs by 44 percent.

Table 5: Average import barriers of high income, upper middle income and lower middle income countries

Income Group	Mean	Range		Number of countries
All countries	1.64	Min:1.01	Max:4.27	57
High income	1.44	Min:1.01	Max:2.3	32
Upper middle income	1.97	Min:1.17	Max:4.27	16
Lower middle income	1.85	Min:1.54	Max:2.78	9

Among the upper middle income countries the average import barriers are about 97 percent higher than U.S. and hence most of countries in this income group are very highly closed economies in context of services trade. In this income group China is the most open economy, whereas Venezuela is the most closed economy with respect to services trade. The average import barriers

of lower middle income countries are also very high, amounting to 85 percent higher than U.S. (from table 5). The values in the table 5 leads to the conclusion that upper middle and lower middle income countries are far more restrictive and closed than high income countries in regards to international trade in services.

Table 6 shows the estimated relative import barriers of all high income countries. It can be seen that relative to other high income countries, the U.S. tends to be most open and countries like Hong Kong and U.K are on a very similar level of openness. Among the high income countries Slovenia is the most closed country.

Table 6: Estimated relative import barriers of high income countries in the total services sector.

Country	Mnj
Hong Kong	1.01
UK	1.03
Germany	1.04
Canada	1.05
Netherlands	1.05
Korea	1.09
Japan	1.1
France	1.13
Australia	1.14
Denmark	1.14
Ireland	1.17
Italy	1.19
Switzerland	1.2
Spain	1.23
Belgium	1.27
Sweden	1.28
Greece	1.37
Austria	1.39
Norway	1.45
Cyprus	1.54
Israel	1.55
Chile	1.61
Portugal	1.63
Finland	1.63
Hungary	1.67
Malta	1.71
Czech Republic	1.74
Poland	1.82
Iceland	1.9
Croatia	1.91
Estonia	1.92
Slovakia	2.19
Slovenia	2.3
U.S.	1
Average Non U.S	**1.44**

5.5. Estimated trade costs in the disaggregated service industries

Table 7 shows mean and the minimum and maximum value of the importer's trade cost in 5 disaggregated service industries (Transportation Services, Financial & Insurance Services, Construction Services and Telecommunication Services) for the average of high income, upper middle income and lower middle income countries for the year 2005.

From table 7, the average incoming trade costs of high income countries are less that average incoming trade costs of upper and middle income countries in all the disaggregated service industries. Incoming trade costs are the lowest in the travel services industry for both the country groups, however because of the data availability travel services trade costs are only estimated for 33 countries. Among the high income countries Austria has the lowest incoming travel services trade costs. Transportation services industry has relatively low trade costs in all the high income countries. Denmark has the lowest transportation services trade costs among high income countries. Venezuela is country with highest transportation services trade costs.

The upper middle and lower middle income countries have relatively low trade costs in the financial and insurance service industry. Countries like Bulgaria, Latvia and Lithuania have very low incoming trade costs in the financial services industry and are comparable to many high income countries. Trade costs in the construction service industry are high among all high income countries. Australia has the highest construction services trade costs. In addition Spain, Czech Republic, Canada and Korea have high trade costs in construction service industry (more than 3.5).

Surprisingly, the construction services trade costs in the upper middle and lower middle income countries are relatively low and are comparable to many rich countries. Nigeria has the lowest construction services trade cost of only 1.18. Iran, Russia, Bulgaria and Mexico have relatively

low construction services trade costs (around 2.5). Low construction services trade costs in this country group implies that more number of poor countries are efficiently removing various trade barriers since construction services is a key infrastructure service and plays a vital role. International trade costs in the telecommunication sector are still high in the most upper middle and lower middle income countries. The mean is 3.02 (from table 7). Mexico has the highest trade cost in telecommunication services industry.

Table 7: Average Trade Costs of High Income and Middle & Lower income countries

Service Industry	High Income Countries			Upper & Lower Middle Income Countries		
	Number of countries	Mean	Range	Number of countries	Mean	Range
Transportation Services	33	1.79	Min:1.15 Max:2.73	19	2.51*	Min:1.55 Max:15.9
Financial & Insurance Services	33	1.91	Min:1.36 Max:2.94	18	2.32*	Min:1.19 Max:13.2
Construction Services	33	2.77	Min:1.66 Max:4.19	20	2.85*	Min:1.18 Max:13.1
Telecommunication Services	32	2.33	Min:1.58 Max:3.85	11	3.02	Min:1.59 Max:4.8
Travel Services	24	1.28	Min:0.99 Max:2.5	9	1.52	Min:1.23 Max:2.04

*in calculation of the averages the outliers have been dropped.

5.6. The determinants of industry trade costs

Table 8 shows the effects of various determinants on disaggregated services industry trade costs. In order to analyze the marginal effect of each determinant, I calculate the exponential values of

d_{kj}^{phys}[10], b_j, l_j and so on. Table 9 summarizes these marginal effects for each disaggregated service industry.

Table 8: Effects of determinants on industry trade costs

	Transportation Services	Financial & Insurance Services	Construction Services	Telecommunication Services	Travel Services
d1	1	1	1	1	1
d2	1.18	1.14	1.15	1.23	1.20
d3	1.25	1.21	1.23	1.36	1.32
d4	1.29	1.26	1.28	1.45	1.35
d5	1.41	1.37	1.43	1.64	1.47
d6	1.59	1.21	1.49	1.92	1.84
Border	0.93	0.96	0.92	0.92	0.90
Language	0.96	0.89	0.98	0.93	0.92
FTA	1.07	1.15	1.06	1.01	1
Currency	1.07	0.96	0.96	1.02	1.04

Note that trade costs are calculated as $d_{nij} = e^{d_{kj}^{phys}} . e^{b_j} . e^{l_j} . e^{f_j} . e^{c_j} . e^{m_{nj}} . e^{\delta_{nij}}$ from equation (5). Therefore, an exponential value of greater than 1 shows an increasing effect of the corresponding country characteristic on trade costs, while a value smaller than 1 shows a decreasing effect. For all the service industries distance has an increasing effect on trade costs. The farther the distance between the two countries higher will be trade costs. However, the financial and insurance services industry is an exception to this statement. It can be noted from table 8 that as we move from the distance category d5 to d6 the value of the coefficient decreases thus if the distance between two countries is 6000 km or more the trade costs are increased only by 21 percent.

[10] the distance between i and n is divided into six intervals (in km): [0; 375); [375; 750); [750; 1500); [1500; 3000); [3000; 6000), and [6000; max), and d_{kj}^{phys} is the effect of the physical distance in the k_{th} interval (k = 1,…., 6).

Distance has a least increasing effect on financial and insurance services trade costs mainly because most of the financial and insurance services can easily be electronically traded.

Also, sharing a common language has the maximum decreasing effect on the financial and insurance service industry trade costs. Using the same language decreases the financial and insurance services trade costs by 11 percent. On the other hand, common language does not play an essential role in construction services and sharing a common language decreases the construction services trade costs by only 2 percent. The border effect is the strongest in case of travel services. If the two countries share a common border the travel services trade costs are reduced by 10 percent.

For the purpose of analyzing the determinants of the importer's trade costs for the disaggregated service industries, I have also estimated import barriers m_{nj} for each country in the sample. The average estimates for both the country groups are reported in Table 9. Note that the import barrier effect m_{nj} is country specific, and relative to the U.S. Table 9 shows the average import barrier of all the high income countries other than the U.S. in the transportation service industry is 1.48. This value indicates that on an average import barriers in all high income countries in the sample are 48 percent higher than U.S. and they increase the incoming trade costs in the transportation services industry by 48 percent. For the high income countries, the average value (calculated as $m_j = (1/N_{high\ inc})\Sigma m_{nj}$, where j = disaggregated service industry) indicates that destination trade barriers increases the trade costs in all service industries.

The high income countries are more open than upper and lower middle income countries in all the service industries except construction services. In case of construction services the average import barriers in the upper and lower middle income countries are only 60 percent higher than U.S.

whereas, high income countries are more restrictive (78 percent) than U.S. The upper and lower middle income countries are most closed in case of trade in transportation services. The average import barriers are 100 percent higher than U.S. Financial and insurance services and telecommunication services are on a similar level of restrictiveness in case of both the high income countries and the upper and lower middle income countries.

It can be clearly seen from table 9 that the average import barriers in all the disaggregated service industry are very high for both the high income countries and the upper and lower middle income countries.

Table 9: Average import barriers of disaggregated service industries

Service Industry	High Income Countries	Upper & Lower Middle Income Countries
Transportation Services	1.48	2
Financial & Insurance Services	1.50	1.77
Construction Services	1.78	1.60
Telecommunication Services	1.54	1.72
Travel Services	1.41	1.43

6. Conclusion

Extending the methodology of EK (2002) and Shikher (2011) to the services trade data, I investigate the magnitude of services trade costs across countries and across sectors by estimating the trade barriers of total services sector and 5 disaggregated service industries for 58 countries for the year 2005.

Results show that the average incoming total services trade costs of the high income countries are much smaller than those of the upper middle and lower middle income countries. For U.S. the average incoming trade costs for the total services sector is about double as compared to incoming trade costs in goods. Distance has an increasing effects on total services trade costs, common language and common border coefficients display decreasing effects. The import barriers (destination effect) have an increasing effect on trade costs. For the high income countries, the average value indicates that it increases the trade costs by 44 percent and for upper middle income countries the average value indicates that it increases the trade costs by 97 percent. It can be concluded that the upper middle and lower middle income countries are far more restricted with respect to services trade and trade costs can be significantly low if destination import barriers are reduced in those countries.

Among disaggregated service industries: transportation services, financial and insurance services, construction services, telecommunication services and travel services high income countries have very high trade costs in construction service industry, ad-valorem tariff equivalent is 177 percent in construction services industry. Upper and lower middle income countries have very high trade costs in all the disaggregated service industries, ad-valorem tariff equivalent is more than 150 percent in most of the industries. Distance has a least increasing effect on financial and insurance services trade costs. Also, language has the highest effect in decreasing the trade costs in the financial and insurance service industry. Relative to U.S. the average import barriers in all the disaggregated service industry are very high for both the high income countries and the upper and lower middle income countries.

Overall, the results of the study are unique and interesting since the paper presents some of the first systematic evidence on the level of trade costs in the services sector. Services trade reforms

can promote efficiency and growth. Liberalization of trade in services, accompanied by the reforms of complementary policies, can lead both to sectoral and economy-wide improvements in performance (Mattoo et al, 2008). Removing various barriers to services sector trade will lead to lower prices, improved quality, and greater variety of key services like transportation services, financial services and telecommunication services. Since services constitute a large fraction of final consumption thus, reducing various barriers to services trade will increase welfare. Also, since many services are used as inputs in the process of production, the inefficient supply of such services acts as a tax on production and thus have a direct effect on the cost of production. Consumers and producers derive not only a direct benefit from diversity in services but also an indirect benefit because a wider variety of more specialized producer services, such as telecommunications and finance, can lower the costs of both goods and services production.

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Table A1: Country Coverage

High Income	Upper Middle Income	Lower Middle Income
United Kingdom	Argentina	Kyrgyzstan
Netherlands	Azerbaijan	Albania
Germany	Belarus	Egypt, Arab Rep.
Denmark	Brazil	India
France	Bulgaria	Indonesia
Hong Kong, SAR	Chile	Morocco
Italy	China	Nigeria
Switzerland	Colombia	Philippines
Ireland	Iran, Islamic Rep.	Ukraine
United States	Latvia	
Belgium	Lithuania	
Canada	Mexico	
Sweden	Russian Federation	
Austria	Turkey	
Korea, Rep.	Uruguay	
Japan	Venezuela	
Spain		
Greece		
Australia		
Norway		
Hungary		
Cyprus		
Israel		
Finland		
Czech Republic		
Portugal		
Poland		
Croatia		
Estonia		
Iceland		
Slovak Republic		
Slovenia		
Malta		

Country classification as per the World Bank country classification.