

ROLE OF EXCHANGE RATE ON SERVICES AND GOODS EXPORTS: A COMPARATIVE EMPIRICAL ANALYSIS

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Abstract: Using the most recent panel time series data for 48 heterogeneous countries for the period 2002-09, the paper explores the impact of a widest and most comprehensive set of relevant determinants on goods and services exports in three varieties of gravity model specifications. The study finds that along with the usual basic gravity factors such as income products, distance, exchange rate depreciation, exchange rate regimes, common language, contiguity, free trade areas in goods and services, colonial links, technological and complementarity factors are quite important in determining the services and goods exports. It finds that depreciation of exchange rate while encourages services exports, it surprisingly discourages goods exports. The positive impact of depreciation is stronger for services exports than its adverse impact on goods exports. This holds true for all types of countries irrespective of their levels of per capita incomes as exporters. Further, the study observes that although income elasticity of import is higher for services and goods for all countries than their respective income elasticity of exports, finding stronger income elasticity of services export for poor countries compared to middle and rich income countries, it suggest that depreciation of currencies strategy has a greater potential for the poor economies to gain from their exports.

Key words: Gravity, income, distance, exchange rate, technological progress

JEL:F1, F2, & F4

The international exchange in recent years is increasingly taking the form of trade in services as opposed to trade in commodities. This is led by worldwide use of modern technological services in the form of information and communication technologies as many of the services can be traded costlessly without producers or consumers have to cross their countries' boundaries.² This increasing internationalization in services accompanied with technological revolution can partly be attributed to production linked to development. The manufacturers in order to stand better at the edge of competition are recouring to various forms of producer services viz. communication, distribution, transportation and financial intermediation etc. in globally integrated market economies (Francois and Hoekman, 2010). This is reflected from commensurate rise in the outsourcing activities as producers are delegating the production tasks into different locations in order to access high quality and cheaper services for minimizing the overall cost of production and thereby improving their sales. This justifies the complementarity between goods and services production and hence their interlinkages in trade. This service intensity in trade is also accompanied by gradual acceleration in unilateral and bilateral liberalization in services trade through Free Trade Agreements (FTAs) driven by prospect of large gains and boom in the cross-border trade and foreign direct investment in services.

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² Delivery of many services still requires physical contact between the supplier and consumer at the same place although technology has to a greater degree has overcome this constraint. This is against the contention of traditional theory of international trade which postulates that services are largely non-transportable and non-tradable due to proximity burden involved in services trade. Services are bound by time and proximity. Eating in a restaurant, getting a haircut, having a medical check-up, or seeking a loan from a bank, all require face-to-face transactions (Baumol, 1967) which poses difficulties to be traded and is the reason of low share of services in total world trade. These services are produced where and when demand arises.

Studies show the past cultural links foster strong trade ties between countries. Common language, common border, colonial and immigration or ethnic links are the traditional mediums through which trade have been promoted between countries (Gould, 1994; Balasubramanyam & Balasubramanyam, 1997; Rauch & Trindade, 1999, Rose, 2000; Park, 2002; Hutchison, 2005, Tharakan, Beveran et. al., 2005). Studies have shown that modern services through internet and telephone mediums not only help transaction of other services internationally but also facilitates goods trade (Freund and Weinhold, 2002; Kandilov & Grennes, 2007). It helps to establish networks between buyers and sellers by matching the customers' needs, taste and preferences for products with the sellers those who can deliver on time. Intense penetration and use of internet along with telecommunications and fax by globally integrating the markets is promoting trade and investments between countries at a faster pace than which was possible through the traditional mediums. These mediums of new links in some instances have weakened the importance of past links on current trade (Freund & Winhold, 2000; Freund & Winhold, 2004; Portes & Rey, 2005; Kandilov & Grennes, 2007) by diminishing the role of distance. Nevertheless, the impacts of modern links are found to be stronger and more effective in fostering trade should there be a common language, cultural ties, colonial links and remoteness of trading partner countries.

The special features in services trade clearly distinguish it from goods trade. Services trade cannot be treated separately from its production and it must have been delivered or consumed by the time it is produced. As coproduction by the consumer of importing country and producer of exporting country is a necessary condition for most of services trade, the quality and quantity of labour and infrastructures involved in services trade are most important determining factors.³ Poor quality and quantity of labour and infrastructures in either of the trading partner countries can be deterrent to services trade (Mirza and Nicoletti, 2004).⁴ This simultaneity in production and consumption is not a necessary condition for goods to be traded and production factors in one country can always substitute the production factors of another country in goods trade.⁵ As tasks accomplished in both partner countries interact in production and exchanges, costly institutions or regulations in either country can also increase the prices of traded services and diminish the bilateral trade (Mirza and Nicoletti, 2004).⁶

Trade in general, whether in services or goods, although to some degree is determined by factor endowments and comparative advantages, a host of other factors facilitate and resist trade. Studies have examined the role of infrastructures or technological progress, regulatory barriers and differences in national regulations and role of membership in regional trade or currency union whether these foster or resist trade between countries.⁷ This study seeks to examine a wide

³ Interaction of tasks among trading partners characterizes only a subset of traded services. Not all of them partly produced are consumed. For instance business services commissioned to a foreign consultancy firms.

⁴As services are more qualitative in nature requiring highly skilled labour, hence, it is relatively heterogeneous by quality and by locations of its production and consumption. Because of its intangible character and quality variability, services cannot be identified before consumed or purchased, generating information asymmetries. Hence, contracting services are risky.

⁵ Domestic factors can be substituted in services trade, only when factor movements are allowed internationally.

⁶Given the intangibility and simultaneity nature in production and consumption of services trade, barriers to trade do not take the form of import tariffs as custom agents find difficulties in readily observing the volume of services crossing the border. Instead, it takes the form of prohibitions, quotas and government regulations to limit the access of Foreign Service supplies to the domestic markets. The NTBs can take the form of - when countries prohibit foreign providers to operate in specific service sectors. Countries also control the prices that discriminates the same products provided by foreigners from the destination country providers or can set different standards with regards to quality of the product. License, qualification and certification and operational restrictions for foreign services providers are one-off costs which impact on fixed cost.

⁷With an exception in Grunfeld & Moxnes (2003), literature provides substantial evidence of positive effect of Free Trade Agreements (FTAs) on goods and services. However, most of the studies do not clearly distinguish the impact of Free trade agreements on services trade from Free Trade agreements on goods trade which is tried in this study.

set of relevant factors that affect bilateral services trade among a panel of selected major services exporters and importers during the most recent period, which is not examined so far in the literature and contrasts the results with their goods exports. This might shed light on policy approaches especially on service trade and exchange rate for the middle and poor emerging countries. This research unlike existing studies while simultaneously analyzes a number of crucial factors that influence services and goods exports, puts significant emphasis on the role of impact of exchange rates on bilateral services exports. While substantial amounts of literature provide evidence that exchange rate undervaluation plays an important role in promoting [goods] exports in general and from developing to advanced economies in particular (Ilker & Sabsigh, 1999, Rodrik, 2008, Eichengreen, 2009, Woodford, 2009, Haddad & Pancaro, 2010), hardly any study analyses the impact of exchange rate on bilateral services exports. As the nature of services trade is different from goods trade especially as far as their nature of movements at the international borders are concerned and given the potential of services sector in trade, therefore, it is imperative to understand if there is any differential impact of exchange rate on both types of aggregative bilateral flows by incorporating other relevant factors.⁸

The present study fills out this research gap by addressing whether exchange rate policies, such as undervaluation or certain exchange rate regimes, can serve as useful tools to spur service sector exports. In particular, it tries to answer - does it matter more or less in bilateral services exports compared to goods exports? Is the effect of exchange rate on trade significantly different for different countries as exporters as well as for different trading country pairs on the basis of their levels of per capita incomes? Alternatively, does the effect of exchange rate on trade differ when exporter is from poor countries than rich or/and middle income countries and does it matter when trade is between poor emerging and industrially rich economies than when trade is between same levels of per capita income countries or different combinations of pairs of countries with different levels of per capita incomes? Does a particular exchange rate regime foster services trade than goods trade? Given the belief that there still exist untapped human capital endowments and natural resources significantly in poor and emerging economies, can any lessons be illustrative from this for assisting the least developed countries (LDCs) in their development process? If a favourable exchange rate policy strategy can be adopted by the least developed or poor emerging economies, that may have the potential of contributing to their higher economic growth, aiding with poverty reduction strategy and relaxing the resource constraints on creation of more infrastructural facilities.⁹ There is sparse literature examining these issues.

It is theoretically established that exchange rate serves as a basic determinant of export demand but its role has largely been ignored while analyzing the bilateral trade between countries especially in the gravity model of trade. While examining the impact of exchange rate empirically, apriori we do not premise why exchange rate depreciation would not promote both the types of exports although the degree of impact may differ for services against goods exports.

⁸ Due to heterogeneity in services trade, while some services trade requires the closeness of customer and service provider, some do not require as it can be delivered through satellite mediums and direct contact through phone and internet connections or the service information can be stored in CDs or software files and sent through different modes, acquiring goods trade character. The former type requires either the customer has to move over to the location of the provider to obtain the services or the services provider has to move over to the location of customer to deliver the services. With restriction on the later kinds of modes of services delivery by the developed countries especially on factors movements from the developing countries, the service providers from developing countries are either providing services from their countries of location or the developed country customers are moving over to the developing countries for obtaining the services due to cheaper costs.

⁹ Many studies have shown that least developing economies enjoy significant comparative advantages in service trade and with removal of restrictions on international trade, it is potentially beneficial for both the developing and developed countries (Nielson & Taglioni, 2004; Francois & Hoekman 2010).

However, the relation can take in any direction depending on the import content of the exporting sectors (Abeysinghe & Yeok, 1998). If the goods exporting sectors are import intensive and require more raw material imports for production of exportables, depreciation of exporting countries' currency may adversely affect goods exports comparing services exports if services exportables are not equally import intensive. Otherwise, it may have same directional influence on both the exports.

The study by focusing on the latest period since 2002 and onwards, when greater free flow of services transactions have been taking place with further initiation of economic liberalization and globalization process across economies and following the GATS negotiations in 1994-95, tries to capture the effects of recent policies from the observed trade data. It uses time series panel data on bilateral trade flows for a wide range of mixed income groups of poor emerging, middle emerging and developed economies and consistently follows the gravity model of trade which has a history of proven success in the empirical literature.¹⁰ The approach taken in this study is different from other existing studies as each of those studies deal with a specific issue of their concern. The present study tries to capture widest and possible broader determinants of services and goods exports depending on their data availability and tries to understand the role most of those important factors from a comparative perspective by controlling those in the regression. In order to make the comparison comprehensive and comparable, apriori without theoretically imposing any restrictions on any of the determinants of services and goods exports, the study mostly tries to consider the same determinants and equalizes the number of observations for both services and goods exports by matching with each other's data availability for each data points. The approach of the study is to let the data speak for themselves rather than we impose any priors.

Application of Gravity Model to International Trade

A great a deal of studies theoretically and empirically have evaluated the suitability of the gravity model to analyze bilateral trade between countries. The basic tenet underlying the model is that the volume of trade between two countries will be directly proportional to the product of their economic masses (measured from GDP or GNP) and inversely proportional to the distance between them (Tinbergen, 1962). Anderson (1979), Bergstrand (1985), Helpman and Krugman (1985) and Deardorff (1995) have shown that gravity model represents a wide class of trade models and is applicable to different theoretical contexts of trade analysis whether it is Heckscher-Ohlin's model of factor price equalization or one assumes imperfect or monopolistic competition in international factor and goods markets with production subject to law of increasing returns to scale. Subsequently, Anderson and Wincoop (2001, 2003) also derived an operational gravity model which explains the border puzzle and captures the multi-resistance factors influencing trade between countries. Based on these theoretical postulates of the models, numerous works have attempted to analyse the determinants of bilateral trade flows commonly to goods sector. It largely excluded analyzing bilateral services trade till as late as early 21st century mainly owing to the accounting lacuna in measuring services trade. However, with availability of compiled data by the international organisations in recent years, the studies have applied the same gravity model to analyse bilateral services trade (Kimura and Lee, 2006, Kandilov & Grennes, 2007) but mostly on cross sectional panel data (Walsh, 2003, OECD, 2009). Each author while augmenting

¹⁰The developed economies are basically the rich countries from OECD group of nations.

different factors along with the basic gravity determinants leaves out some important common factors captured in some others among the recently augmented gravity models.

The present work draws on McCallum (1995)'s simple gravity model as the starting point, which relates bilateral trade flows between two regions to the output of the regions, their bilateral distance, and whether they are separated by a border. Similarly, many other studies consider basic variables such as GDP, per capita income (GDP and per capita income substitutively) and population or density (population to land area ratio) and distance (Eaton & Tamura, 1994; Grünfeld & Moxnes, 2003).¹¹ This study also draws insights from other studies in accounting the impact of a wide variety of comprehensive relevant gravity factors like economic freedom or regulations (Walsh, 2006; Kimura & Lee, 2006), differences in regulatory policies between countries (OECD, 2007 & 2009), membership in any Regional Free Trade Areas (RFTAs) and General Scheme of Preferences (Rose, 2000; Subramanian & Wei, 2007, Grünfeld & Moxnes, 2003, Sauve & Shingal, 2011) in analyzing the bilateral service exports among major emerging and developed economies to each other.¹² And along the lines of Anderson and Wincoop (2003), we consider other bilateral trade resistance factors measured from tariffs and non-tariff barriers, common language, colonial links, social and cultural networks, inclusive of geographical distance along with the multilateral trade resistance factors by explicitly capturing the prices of products prevailing between two trading partners from the bilateral real exchange rate measure.¹³ Any other multilateral resistance factors like relative distance (remoteness) which could not be explicitly accounted in our specification, are likely to be implicitly captured through the introduction of importer and exporter country fixed effects along the lines of Anderson and Wincoop (2003) and Subramanian and Wei (2003). In line with Rose (2000), the study also accounts for the exchange rate regime of exporters and importers as any exchange rate regimes in two trading countries if that reduces the uncertainty and transaction costs relative to the default regimes, will tend to increase trade between them. It can have also indirect effect of lowering the transaction cost like common currency union.¹⁴ It also draws on the work of Gould (1994), Rauch & Trindade (1999), Freund and Weinhold (2002), Kandilov & Grennes (2007) in accounting the effects of 'technological progress' and other 'network link effects' on trade. A simple standard gravity model can be represented as follows:

An Augmented Gravity Modeling Approach

$$X^{i}_{jt} = \beta_0 (Y_{it})^{\beta_1} (Y_{jt})^{\beta_2} (D_{ij})^{\beta_3} (EX_{ijt})^{\beta_4} (A_{it})^{\beta_5} (A_{jt})^{\beta_5} \exp(\xi Z_{ijk} + e_{ijt}) \dots \dots \dots \quad (1)$$

Expressing the above equation (1) in logarithm terms and adding time and country-specific dummy variables, it can be rewritten in the following way (2):

¹¹While estimating gravity models, some studies have considered both GDP, GDP per capita (Tharakan et. al. 2003, Eaton and Tamura, 1994, Rauch, 1999, Grünfeld & Moxnes, 2003) to see their separate influences in the same gravity equation. Some studies use product of these variables while others use them separately to distinguish between importing and exporting countries' income effects. However, some studies expressing the concern over multi-collinearity among these variables if included simultaneously in same model, have considered using per capita GDP in place of GDP (Kimura & Lee, 2006) with the inclusion of both population and area as separate variables.

¹² General Scheme of Preferences (GSP) refers to a preferential scheme extended by the advanced importing countries to the less developed exporting countries on a non-reciprocal basis. UNCTAD documents the list of countries those who provide such benefits and the beneficiaries.

¹³ This study modifies McCallum's equation by augmenting with an important multilateral trade resistance factor i.e. bilateral real exchange rate which is expressed as a product of price ratio between trading pairs and corresponding country pairs' (bilateral) nominal exchange rates.

¹⁴ The definition of common currency for our purpose refers to trading country pairs with the same national currency. This largely represents only the EU member countries under the common currency union and accounted by a dummy which is variable over time in our estimation as countries have joined the union in stages.

$$\ln \exp_{ijt} = \alpha_0 + \alpha_t + \alpha_i + \alpha_j + \beta_1 (\ln y_{it} \cdot y_{jt}) + \beta_2 (\ln Dist_{ij}) + \beta_3 (\ln Ex_{ijt})_h + \beta_4 (\ln Ex_{ijt})_m + \beta_5 (\ln Ex_{ijt})_l + \beta_6 (A_{it}) + \beta_7 (\ln A_{jt}) + \beta_8 (\ln Z_{ijt}) + e_{ijt} \quad \dots\dots\dots(2)$$

X^i_{jt} - Bilateral real exports of either goods or services measured in US dollars, from country I's to country J's over time.

Y_{it} - Exporting country I's income, measured by real gross domestic product (GDP) in US dollars representing the supply factor over time.

Y_{jt} - Importing country J's income, measured by real gross GDP in US dollars, representing the demand factor over time.

D_{ij} - Distance between the capitals of two countries i and j known as great circle distance.

EX_{ijt} - Bilateral real exchange rate of currencies between I and J over time (exporters' currencies per unit of importers' currencies). This is defined as price ratio between the two countries multiplied by their corresponding nominal exchange rates.¹⁵ The exchange rate in the above is broken into three terms on the basis of the low, middle and high per capita income exporters.

A_i & A_j - All other quantifiable trade facilitating or resisting factors such as number of computers, internet users, number of telephone lines, mobile subscribers, average tariff rates, time zone differences, population density (population per square km), proportion of stock of bilateral immigrants, years of education in secondary and post-secondary education in importing and exporting countries respectively,

Z_{ij} - Trade promoting & resisting factors such as common language, contiguity, common currency, landlocked, colonial link, General Scheme of Preferences (GSP), FTAs, exchange rate regimes etc. represented through dummies.

α_j - Importing countries' dummy (capturing the factors specific to the importing country)

α_i - Exporting countries' dummy (capturing the factors specific to the exporting country)

α_t - Timespecific factor common to all pairs of countries

e_{ijt} - Disturbance term representing for any other missing factors affecting exports from i to j.

Methodological Framework

We estimate the above relationships as in equation 2 in two other variants of the gravity model presented in equations 3 & 4, by applying individual country and time fixed effect panel OLS regressions along with accounting the complementarity effects between goods and services

¹⁵The price ratio between importer and exporter can be taken to represent one of those multilateral resistance indicators. If there is domestic service providing firms pay relatively less taxes than the foreign firms, the domestic firms can set the price of services at a lesser level in order to keep away foreign firms out of competition. In case there is no discrimination of foreign and domestic provider by the importing country, lesser prices by the domestic firms can still keep away the foreign firms out of competition and higher prices can always induce more imports from foreign firms located in foreign countries.

exports.¹⁶ The three variants including the above equation 2 specified are estimated for both the goods and services exports equations, on the basis of (a) without differentiating between countries' per capita income classes, (b) differentiating the per capita income classes and (c) combinations of trading country pairs with different per capita income classes. This is done in order to gain more insights on the parameters of our interest i.e. exchange rate coefficient along with basic gravity factors.¹⁷ We also later verify the robustness of these results from the Poisson Pseudo-Maximum Likelihood (PPML) estimating procedure devised by Silva & Tenreyro (2006) which deals with accounting zero values in trade and heterogeneity among countries.

Among other key issues the 1st model given in equation 2 tries to answer how does the product of income influence bilateral trade in services and goods exports? Does the exchange rate matter when exports are from rich than from middle and poor income countries? Corresponding to equation 2, we estimate following other two variants of gravity models which are the expanded version of gravity equation 2 with income classification of trading countries.

Equation 3 is specified to estimate the extent of variation in income propensity to import and export separately on the basis different per capita income classes of importers and exporters. Does the income of poor countries matter more in trade as compared to rich and middle income countries? How does the exchange rate matter in trade when exporter is from rich and importer is from middle or poor income countries than otherwise?

$$\begin{aligned} \ln \exp_{ijt} = & \alpha_0 + \alpha_t + \alpha_i + \alpha_j + \beta_1 (\ln y_i)_h + \beta_2 (\ln y_i)_m + \beta_3 (\ln y_i)_l + \beta_4 (\ln y_j)_h + \beta_5 (\ln y_j)_m \\ & + \beta_6 (\ln y_j)_l + \beta_7 (\ln Dist_{ij})_{h \rightarrow h} + \beta_8 (\ln Dist_{ij})_{h \rightarrow m} + \beta_9 (\ln Dist_{ij})_{h \rightarrow l} + \beta_{10} (\ln Dist_{ij})_{m \rightarrow h} + \\ & + \beta_{11} (\ln Dist_{ij})_{l \rightarrow h} + \beta_{12} (\ln Ex_{ij})_{h \rightarrow h} + \beta_{13} (\ln Ex_{ij})_{h \rightarrow m} + \beta_{14} (\ln Ex_{ij})_{h \rightarrow l} + \beta_{15} (\ln Ex_{ij})_{m \rightarrow h} + \\ & \beta_{16} (\ln Ex_{ij})_{l \rightarrow h} + \beta_{17} (\ln A_{it}) + \beta_{18} (\ln A_{jt}) + \beta_{19} (Z_{ijt}) + u_{ijt} \dots \quad (3) \end{aligned}$$

Whereas, h, m and l indicate high, middle and low income countries respectively, $(\ln y_i)_h$ refers to logarithm of rich importing countries' income, $(\ln y_j)_h$ refers to logarithm of rich exporting countries' income, $(\ln Dist_{ij})_{h \rightarrow l}$ refers to logarithmic value of distance from rich exporter to poor income importer and similarly, all other similar variables follow the same pattern of notations. All other symbols hold good as in equation 2.

The following equation which pairs the income product on the basis of their income classes of trading countries, examines Linder's hypothesis without losing the spirit of the gravity model. On the basis of Linder's hypothesis, economists postulate that similar is the per capita income levels of country pairs in trade is likely to intensify trade between them than dissimilarity in per capita income levels. Therefore, equation 4 is specified to establish - does the similarity in per capita income levels of the countries in trade, promote trade between them compared to the dissimilarity in their income levels controlling their distances between trading pairs? Does the

¹⁶ The study basically interprets the results from the model accounting the complementarity effect as it besides taking into account of complementarity between both the exports relationship, it yields better adjusted R-bar square and it does not distort the parameters estimates except changing their magnitude.

¹⁷ Anderson and Wincoop (2003) and Subramanian and Wei (2003) suggest that the standard gravity model will be miss-specified unless it is augmented with multilateral resistance term. They also suggest that multilateral resistance cannot be captured from remoteness variables based on measures of distance as this does not capture border effects. Rather, the model must be solved by taking into account impact of barriers due to price differences. Further, Anderson and Wincoop (2003) suggest that this can be captured reasonably through country fixed effect models. However, by considering real exchange rate to be a factor, our analysis partially and implicitly captures the multilateral resistance to trade.

exchange rate matter in trade for countries having similar levels of per capita incomes? And what is the impact of the exchange rate on trade if the countries have dissimilar pattern of incomes or any combination of country pairs with different incomes?

$$\begin{aligned} \ln \exp_{ij} = & \alpha_0 + \alpha_t + \alpha_i + \alpha_j + \beta_1 (\ln y_i \cdot y_j)_{h \rightarrow h} + \beta_2 (\ln y_i \cdot y_j)_{h \rightarrow m} + \beta_3 (\ln y_i \cdot y_j)_{h \rightarrow l} + \\ & \beta_4 (\ln y_i \cdot y_j)_{m \rightarrow h} + \beta_5 (\ln y_i \cdot y_j)_{l \rightarrow h} + \beta_6 (\ln y_i \cdot y_j)_{l \rightarrow m} + \beta_7 (\ln Dist_{ij})_{h \rightarrow h} + \beta_8 (\ln Dist_{ij})_{h \rightarrow m} + \\ & \beta_9 (\ln Dist_{ij})_{h \rightarrow l} + \beta_{10} (\ln Dist_{ij})_{m \rightarrow h} + \beta_{11} (\ln Dist_{ij})_{l \rightarrow h} + \beta_{12} (\ln Ex_{ij})_{h \rightarrow h} + \beta_{13} (\ln Ex_{ij})_{h \rightarrow m} + \\ & \beta_{14} (\ln Ex_{ij})_{h \rightarrow l} + \beta_{15} (\ln Ex_{ij})_{m \rightarrow h} + \beta_{16} (\ln Ex_{ij})_{l \rightarrow h} + \beta_{17} (\ln A_{it}) + \beta_{18} (\ln A_{jt}) + \beta_{19} (Z_{ijt}) + u_{ijt} \dots \quad (4) \end{aligned}$$

Whereas, the above notations indicate the same variables as in equations (3) and (4). However, while using these variables later in the estimation are labeled in their expanded forms.

Empirical Analysis

The panel OLS estimates corresponding to the bilateral export equation 2 are presented in Table 1. For each services export model estimated, correspondingly the estimates for goods exports are reported for easy of comparison on their determinants. The main results on bilateral services and goods exports are presented in columns 3 & 4 of Table 1 respectively, based on their time series panel data relating to the period 2002-09. This incorporates all the variables including the complementarity effects between goods and services exports except the proportion of immigrants from importers at the exporting countries and the proportion of immigrants from exporters at the importing countries along with years of (secondary and post-secondary) education in respective exporting and importing countries. The latter two variables could not be incorporated in columns 3 & 4 because of their nature of cross sections.¹⁸ Once immigration variable is added to capture the effects of cultural and information links on services and goods exports, OLS provides cross section panel OLS estimates for only 2004 and when education variable is added to capture the effects of human capital formation, it yields estimates only for 2009. So accordingly cross sectional panel OLS estimates are reported in columns 5 & 6 and columns 7 & 8 of Table 1 respectively for goods and services exports with respective additions of variables.

The model without incorporating the complementarity relationships between services and goods exports are also shown in columns 1 & 2. However, with the incorporation of complementarity effect of goods and services exports in columns 3 & 4, it is seen that the model marginally better fits both the goods and services equations as reflected from their higher values of adjusted R-bar squares and results are mostly consistent in terms of their respective signs and significances comparing the estimates without incorporating the complementarity effect.¹⁹

Contrasting the bilateral services exports with bilateral goods exports, it is seen that almost the same sets of factors that explain the services exports also explain the goods exports but there are minor differences with regard to the signs and magnitude of few parameters especially relating to the exchange rate variable which is our prime focus. The complementarity effect of goods exports on services exports is found to be larger than the complementarity effect of services

¹⁸Although education variables are available for the year 2005 and 2009 but when the estimation command is prompted for estimation, it only considers the data for 2009 which is purely due to the missing observations on other independent variables. Since immigration data is available only for 2004, therefore in the absence of commonality in the year of availability of the data between immigration and years of education, it is difficult to estimate by inclusion of both the variables in a model. It does not provide any parameter estimates incorporating both the variables simultaneously due to their data mismatch problem.

¹⁹With a surprise the regression models marginally better fits goods exports equation than services equation.

exports on goods exports. This may imply that goods exports might be consuming lots of services than what services exports consume in ways of goods exports. The complementarity effect on services exports is basically predicted to capture the past historical and cultural linkages established through goods trade which makes easier to trade in services. The complementarity effect on goods exports contrastingly might capture the role of modern services in matching the buyers and sellers through removing the information barriers.²⁰

The signs of basic determinants such as elasticity of product of income and distance for services and goods exports are in line with the prediction of gravity model of trade. Further, the income product elasticity is higher for services exports than goods exports indicating that with an increased income, there is an increasing trade in services than in goods, and as expected, the effect of distance as a trade cost factor matters more for goods exports than service exports reflecting relative higher transportation costs for goods exports than services. Once the complementarity effect is incorporated, although it drastically reduces the role of distance on both services and goods exports but it drastically reduces the effects of distance on services exports than goods exports implying higher transaction cost (sunk cost) for services trade than goods trade. Besides, the complementarity effect also strongly reduces the role of colonial link, contiguity, common language and membership in free trade areas including the managed exchange rate regime and the rule of law in both goods and services exports.

Comparing the real exchange rate effect of the exporting countries' currencies per unit of importing countries' currency on their exports which is focus of our interest, it shows that depreciation of exchange rate of the middle income countries' currencies have a stronger positive impact on services exports than the depreciation of poor and rich countries' currencies. When it involves goods exports, the pattern of effect is almost similar but signs surprisingly turned out to be contrary to the expectation for all the exporting countries. The depreciation of the middle income countries' currencies is found to have a stronger significant negative impact on their goods exports compared to rich countries and the exchange rate impact is not significant for the poor countries. So this implies that currency depreciation while boosts up services exports but the same discourages goods exports and the effect is stronger for the middle income countries than rich and poor countries. This negative impact of depreciation on goods exports irrespective of the countries' per capita income classes, may be, because the exporting countries are heavily relying on the cross border intermediate input services and raw material imports for their production and delivery of goods. With depreciation of their domestic currencies, implying higher cost of raw materials and services imports discourages them to export more goods.

The common currency has almost an equal and positive effect on both the goods and services exports, while colonial link, GSP, common language, and contiguity similar to many previous studies (Walsh, 2006, Kandilov and Grennes, 2007) have larger positive effects on services exports than on goods exports. Although only when one of the trading partners is under managed exchange rate regime, it has a greater positive impact on goods exports than services but when both the partner trading countries are on a fixed exchange rate regime, it significantly discourages goods exports without impacting services exports and even latter's negative impact on goods exports dominates the positive impact of the former regime. Free trade agreement in

²⁰ It is not only that goods exports require services exports but also the reverse may hold true. The international delivery of services also requires goods exports. For example, computer or its parts might be produced somewhere other than the user country and the computer using country (importer) might be providing technical or software services to some other country through the use of internet.

goods sector has a stronger impact on goods exports than the free trade agreement in services on services exports which could be partly due to smaller number of services trade agreements in proportion to goods trade agreement and partly due to the historically smaller scale of services trade in proportion to goods trade.

As expected, the time zone difference has greater negative impact on service exports than goods exports. This may be because many services are exchanged over space and time while goods largely need to be transported for exports and it unavoidably takes time with increased distance barrier. While time difference is natural or usual for goods delivery, but services exports can be sensitive to time as it need to be delivered on real time when demanded (if it cannot be delivered by one, can be done by others) especially with increasingly modernization of technologies.

Rule of laws in both the exporting and importing countries promote services exports while the same in the exporting countries discourages goods exports and in the importing countries, it does not have any consequence on goods exports. The adverse impact of the rule of the law of the exporting countries on their goods exports is similar to the evidence by Egger (2002) for the OECD countries. This implies that stricter and transparent are the national laws and regulations in both the trading partner countries, it promotes more services trade while the same does not promote goods exports from countries. The number of air passengers arrived from exporting countries in the importing countries and air passengers arrived from importing countries in the export originating countries in proportion to their respective countries' per million population is seen to encourage service exports while it does not have any effect on goods exports. This could be due to more tourists' visits to different destinations as a component of services exports or due to an increase in onsite services offered by the passengers who come as self-employed or employees of multinational companies or for other trade and business purpose visits by the delegates (for trade agreements and ties between countries) for improving service trade, while the same surprisingly does not influence goods exports.

The internet use as expected significantly promotes both goods and services exports.²¹ Number of broad band subscribers in the importing country promotes services imports while the same in the exporting country does not contribute to service exports. Some studies hypothesize with the inclusion of complementarity effects of total services on goods exports, these technological variables will cease to play their roles, which is not true here. Electricity consumption in kilo watt per person as an infrastructure indicator is supposed facilitate both goods and services exports, surprisingly it is found to play no role in both the areas of exports. This may be because electricity is not a tradable commodity or there is over utilization of its utility without any marginal contributions in raising the productivity of goods and services in countries.

The number of mobile subscribers and number of telephone lines in the exporting and importing countries are supposed to promote trade in both services and goods through establishing the networks between countries but surprisingly both have negative impacts on services trade while number of mobile subscribers play a positive role for goods trade and the number of telephone lines have negative impact on goods and services exports alike. The negative impact of both in services trade could be for the reasons that the data relating to these variables rather than capturing its role as an infrastructure facilitating indicator for promoting goods and services trade

²¹ It is also seen that with introduction of complementarity effects, although the role of technological factors like internet use are consistently found to play important role in both goods and services exports, but the magnitude of the impact is consistently reduced in both types of trades.

might be capturing the effects of the nature of national regulatory policies relating to trade in telecommunication services as many countries are still following restrictive policies in these lines of business services and trade. In many countries, this sector is under the state monopoly or allows restrictive entry of foreign players as cited in literature (Hoekman et al., 2007). While mobile may be helping the international transactions in goods and services but the telephone lines are not meant to be traded. So it raises the concern that whether the data is realistically capturing what they are intended for or capturing something different. One should approach more cautiously about this issue, requiring a further in depth investigation about the telecom policies being followed in different countries. The tariff which is usually charged on goods exported by the importing countries strongly discourages goods exports rather than services as there are difficulties in imposing tariffs on services due to its intangible nature.

The inclusion of immigration in the cross section panel regression (columns 5 & 6) although reduces the importance of the role of distance for both goods and services exports but it has greater role in reducing the role of distance for service exports than goods exports. This result is not surprising as goods needs to be transported requiring more transportation cost and lesser sunk cost, while there are greater sunk costs for services trade which can be drastically reduced by improving on communication infrastructure and immigration links. The diminishing importance of distance is verified after dropping immigration variable from the model on the cross sectional series. The years of post-secondary education in the importing country discourage services exports from other countries while the same in the exporting countries help in promoting goods exports. The latter may be by raising productivity in the production of goods but the same in services acts in the opposite direction implying more skilled people may tend to reduce import of services.²²

Table 1: Panel regression Estimates without income class of Importers and Exporters

VARIABLES	(1) log of services exports	(2) log of goods exports	(3) log of services exports	(4) log of goods exports	(5) log of services exports	(6) log of goods exports	(7) log of services exports	(8) log of goods exports
log of goods exports			0.350*** (25.79)		0.234*** (5.085)		0.339*** (13.01)	
log of services exports				0.238*** (25.57)		0.152*** (5.323)		0.254*** (12.79)
log of income products ¹²	0.623*** (6.846)	0.418*** (5.564)	0.474*** (5.431)	0.272*** (3.754)	0.196 (0.648)	0.147 (0.617)	0.200 (1.038)	0.266 (1.588)
log of capital distance	-0.742*** (-18.47)	-0.821*** (-25.04)	-0.464*** (-11.60)	-0.641*** (-19.89)	-0.259** (-2.054)	-0.559*** (-5.877)	- (-6.322)	- (-9.347)
common currency	0.261*** (4.697)	0.261*** (5.869)	0.193*** (3.624)	0.189*** (4.422)	0.115 (0.735)	0.148 (1.237)	0.200* (1.878)	0.185** (2.042)
colonial link	0.699*** (12.26)	0.382*** (8.141)	0.559*** (10.20)	0.217*** (4.779)	0.185 (1.090)	0.135 (1.011)	0.534*** (4.806)	0.282*** (2.919)
Free Trade Areas in Services	0.357*** (7.548)		0.202*** (4.427)		0.559*** (2.940)		0.159 (1.601)	
Free Trade Areas in Goods		0.430*** (11.88)		0.335*** (9.598)		0.749*** (5.405)		0.386*** (4.843)
General Scheme of Preferences	-0.0343 (-0.405)	-0.214*** (-3.050)	0.0421 (0.518)	-0.206*** (-3.072)	-0.342 (-1.288)	-0.141 (-0.674)	0.0953 (0.590)	-0.224 (-1.591)
Contiguity	0.769***	0.737***	0.500***	0.559***	-0.0108	0.428*	0.612***	0.600***

²² This in contrast Mirza and Nicoletti (2004) observed a negative impact of years of higher education in the exporting countries on their exports. They inferred such outcome due to increase in productivity in services exporting sectors. As productivity rises, the skilled manpower may relatively bargain for higher wages even compared to the manpower in goods sector. When wages rise up, it would be reflected in prices of products and hence hampers services exports.

	(7.963)	(9.245)	(5.383)	(7.286)	(-0.0354)	(1.777)	(3.256)	(3.666)
Common official language	0.516***	0.314***	0.404***	0.195***	0.265*	0.293***	0.477***	0.0655
	(11.09)	(8.158)	(9.037)	(5.236)	(1.889)	(2.671)	(5.293)	(0.828)
log of low income exporter's exchange rate	0.0867***	-0.0319*	0.0956***	-	0.108*	-0.0328	0.134***	-0.0493
	(3.837)	(-1.712)	(4.419)	(-2.834)	(1.701)	(-0.655)	(2.993)	(-1.259)
log of middle income exporter's exchange rate	0.133***	-0.0357*	0.143***	-	0.187***	-0.0685	0.184***	-
	(5.911)	(-1.926)	(6.639)	(-3.725)	(2.784)	(-1.283)	(3.983)	(-2.191)
log of high income exporter's exchange rate	0.0385**	-	0.0502***	-	0.0566	-0.0678**	0.0734**	-
	(2.571)	(-2.848)	(3.501)	(-3.736)	(1.520)	(-2.312)	(2.438)	(-2.017)
log of absolute time zone differences	-0.255***	-0.137***	-0.192***	-	-0.159*	-0.0796	-0.160**	-0.0782
	(-7.819)	(-4.984)	(-6.153)	(-3.283)	(-1.655)	(-1.001)	(-2.551)	(-1.381)
log of rule of law1	0.626**	0.390	0.490*	0.239	18.32	-7.428	0.349	-0.132
	(2.102)	(1.587)	(1.717)	(1.013)	(1.602)	(-0.822)	(0.326)	(-0.142)
log of rule of law2	0.970***	-0.374	1.094***	-0.593**	4.692	-10.08	1.116	-0.0388
	(3.308)	(-1.551)	(3.897)	(-2.553)	(0.315)	(-0.848)	(1.069)	(-0.0426)
log of air passengers arrived1	0.117***	0.0112	0.115***	-0.0177	0.00622	-0.736***	0.0305	-0.0269
	(2.681)	(0.309)	(2.741)	(-0.512)	(0.0184)	(-2.769)	(0.342)	(-0.346)
log of air passengers arrived2	0.0724*	0.0255	0.0657	0.00685	-0.513	0.497	0.00831	-0.107
	(1.654)	(0.705)	(1.568)	(0.197)	(-1.190)	(1.438)	(0.0931)	(-1.373)
log of internet user1	0.206***	0.111**	0.161***	0.0706	6.614	-0.735	0.0532	0.280
	(3.265)	(2.139)	(2.662)	(1.410)	(1.359)	(-0.191)	(0.259)	(1.567)
log of internet user2	0.221***	0.149***	0.164***	0.0979**	3.775	-2.371	0.0519	0.244
	(3.561)	(2.907)	(2.752)	(1.988)	(0.662)	(-0.519)	(0.260)	(1.401)
log of mobile subscriber1	0.0623	0.180***	-0.00588	0.167***	-3.397**	0.0246	0.0147	0.472***
	(1.177)	(4.135)	(-0.116)	(3.985)	(-2.487)	(0.0228)	(0.0867)	(3.198)
log of mobile subscriber2	-0.0929*	0.0497	-0.113**	0.0718*	2.720	0.798	0.155	-0.117
	(-1.832)	(1.189)	(-2.331)	(1.789)	(0.906)	(0.335)	(0.959)	(-0.834)
log of number of telephone lines1	-0.389***	-0.158**	-0.330***	-0.0745	-16.48*	0.764	-0.122	-0.0627
	(-4.713)	(-2.324)	(-4.176)	(-1.138)	(-1.840)	(0.108)	(-0.534)	(-0.315)
log of number of telephone lines2	-0.267***	-0.0988	-0.232***	-0.0334	-4.277	4.676	-0.0476	-0.375**
	(-3.298)	(-1.478)	(-2.996)	(-0.519)	(-0.335)	(0.456)	(-0.218)	(-1.968)
log of average tariffs1	0.00932	-0.126**	0.0626	-0.135***	-1.970	2.106*	-0.164	0.145
	(0.149)	(-2.441)	(1.047)	(-2.721)	(-1.254)	(1.700)	(-0.716)	(0.722)
log of average tariffs2	-0.0817	-0.155***	-0.0188	-0.140***	4.269	2.616	-0.0768	-0.199
	(-1.317)	(-3.020)	(-0.316)	(-2.854)	(1.395)	(1.081)	(-0.341)	(-1.014)
log of immigrant proportion1					0.185***	0.0609**		
					(5.796)	(2.373)		
log of immigrant proportion2					0.141***	0.0183		
					(4.408)	(0.716)		
log of average years of post secondary education1							-0.872**	0.427
							(-2.071)	(1.162)
log of average years of post secondary education2							-0.551	0.648*
							(-1.307)	(1.764)
Constant	-7.903**	-2.964	-6.418*	-1.277	131.4	-51.68	-2.250	11.24
	(-2.158)	(-0.982)	(-1.831)	(-0.441)	(0.923)	(-0.454)	(-0.258)	(1.482)
Observations	7,408	7,426	7,407	7,407	828	828	1,903	1,903
R-squared	0.856	0.897	0.868	0.906	0.885	0.922	0.863	0.903

Note: t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1,

1 and 2 indicate importing and exporting countries respectively. All the above models are estimated with country and time specific dummy coefficients, however these coefficients are deleted from the above table for reason of space constraint.

Log of population density, one under managed exchange rate regime, One under fixed exchange rate regime, One under managed and one under free float exchange rate regime, Both under managed exchange rate regime, Both under free float exchange rate regime, log of secure server, log of electricity consumption, log of broadband subscribers and log of average years of secondary education are used as controlled variables for both the importers and exporters in each of the above models but owing to space constraint and finding them mostly insignificant dropped out reporting from the above results. Landlocked was eliminated before estimating final model due to its insignificance.

Table 2 presents the results where the gravity model is estimated by separating incomes of exporters and importers on the basis of their income classes. The distance and exchange rate

coefficients are also paired on the basis of same per capita income class of exporters and importers to observe whether there is any result difference from the above model and whether it offers any economic policy implication. To examine the separate impact of exporters' and importers' incomes on services and goods exports on the basis of their per capita income classes into low, middle and rich income countries, we separate out their incomes in Table 2, instead of considering product of exporters' and importers' incomes on an aggregative basis. Besides, we separate out the role of distance and exchange rate variables on the basis of when trade takes place between similar per capita income countries and between different per capita income country pairs.²³ This classification is made into 5 out of 9 possible pairs depending on the availability of services exports data for countries falling under different per capita income classes. The five categories are: when export is from (1) rich to rich and (2) rich to middle, (3) rich to poor, (4) middle to rich, and (5) poor to rich. Since the available data observations for other rest 4 categories of pairs are either very less or largely missing from our data sample, the estimates are not derived for those as it may merely represent the specific country situations considered in the analysis.²⁴

The main results based on time series data are produced in columns 1 and 2 in Table 2 with the inclusion of complementarity effects of goods and services exports. The consistency of most of the parameters are also observed to hold even without incorporating the complementarity effects but results are not produced to avoid too much information in the same table. The estimates in columns 1 & 2 reveal that the complementarity effects cannot be ruled out for both goods and services exports equations and the effect is consistently stronger for service exports than goods exports in a similar way as observed earlier.

It shows that increased income levels of middle and poor countries similar to rich countries have also stronger impacts on their services imports compared to the goods imports. This implies that with rise in income levels, all countries irrespective of their per capita income classes are likely to import more services than goods.²⁵ However, with increased incomes, the low income countries are found to significantly exporting both services and goods and then it is the rich income countries while middle income countries are found exporting in goods only. Further, comparing the income elasticity of exporters for services exports with goods exports, it shows that the negative income elasticity of services exports for the middle income country exporters is almost similar in magnitude with their positive income elasticity of goods exports. This implies that middle income countries, with their increased income reduce services exports almost to an equal extent of their increased goods exports. For low income country exporters, the income elasticity of services exports is positively significant and higher compared to their income elasticity of goods exports. This implies that with increased incomes, poor countries are exporting more services than in goods, which is opposite to the middle income countries' export response. For rich income exporters, increased income although induces them to export more services compared to their goods exports but their increased incomes as importers have the strongest impact on their services imports compared to the middle and poor countries and have no impact on their goods imports. In overall, with increased incomes, although all the countries

²³Distance separation between country pairs would likely to reflect the relative transportation cost between country pairs.

²⁴The results based on these latter pairs may not be well representative of all similar country pairs absent from our sample but falling into these similar per capita incomes country pairs.

²⁵ Although this result is almost consistent with the estimates without inclusion of complementarity effects, however, the income elasticity of importers for rich and income elasticity of exporters for both poor and rich are found to be insignificant with goods exports equation once the complementary effect is incorporated in the model.

are net importers more in services than goods, and rich and middle income countries are relatively large net importers of services than poor, and middle income countries are large net importers in goods than poor and rich, but the increased income of the poor countries has the strongest positive impact on their services exports than any other country. But interestingly, with increased incomes, the rich countries are exporting lesser in services (along with middle income countries) as well as in goods and only the poor countries are exporting both in services and goods. The density of population in both the importing and exporting countries are associated with decreasing services exports but no impact on goods exports.

Distance as a cost factor in trade as expected usually shows negative impacts on exports of services and goods. But when exports are from rich to similarly rich income countries, distance is seen to matter more for goods exports than services exports while the same is not true when trade takes place between any other country pairs including when poor and middle income countries are one of the trading partners with any other country as distance matters more in services exports than their goods exports. This latter finding is similar to the evidence by Kimura and Lee (2006) that distance still matters for certain services trade. It is also seen that while distance significantly matters among almost all country pairs in services exports, it matters less in goods exports from poor to high income countries.²⁶ While it is yet to be fully understood why distance significantly matters for services exports compared to goods exports at least for the middle income countries but it can easily be understood why distance greatly matters for services exports specifically from poor to rich income countries.²⁷ This could mainly be due to poor quality of communication infrastructure facilities in poor countries.

This implies that distance matters depending on types of trading country partners whether rich or poor. For instance, when services are exported from poor to rich as well as from the middle income countries, distance matters which might be on account of lack of proper infrastructural facilities such as physical telecommunication network facility, quality of network, speed of internet connection and quality of electricity consumption etc.. Rather, it may matter less or never hinders goods exports from poor to rich and middle income countries than from any other countries to these with equal or higher distances. This might be due to relatively low cost of transportation on account of lower wages (in transportation) in poor countries. This is reflected from our empirical results as distance matter less for goods exports from poor to rich.

The depreciation of exporter's currencies per unit of importer's currencies is seen to significantly promote services exports for country pairs when especially export is from high to high, middle to high and poor to high income countries. This result is almost consistent with the estimates without the inclusion of complementarity effect. However, among these three classes of exporters, the effect of exchange rate is relatively stronger when middle income countries export services to rich countries, and then poor countries export to rich and rich countries exports to rich countries than any other country pairs. In contrast, the depreciation of exchange rate discourages goods exports from rich to poor, middle to rich and surprisingly does not have any influence on

²⁶ The role of distance in representing the transportation cost may disappear because price of products inclusive of the transportation cost might be very lesser if imported from poor countries compared to the imports from other rich countries.

²⁷ Distance mattering in services exports from high to middle and middle to middle than in goods exports implies that these high income countries might be transacting services between them either by establishing foreign affiliates in services in each other's country or they might be providing onsite services to each other than the poor countries.

goods exports from high to high and rich to middle income countries.²⁸ The negative effects of depreciation is higher for rich income exporters especially while exporting to poor countries than the exports being from poor to rich, middle to rich countries. This implies that depreciation of currencies dominantly influences services exports from the middle income countries and then from the poor countries, and goods exports from the high income countries, which is almost in conformity with our previous results. However, the positive impact of depreciation on services exports is found to be stronger than its negative impact on goods exports.

Similar to previous results, common currency, common language, membership in regional free trade agreements, colonial link promote both exports in goods and services and these have stronger influences on services exports than goods exports. In contrast, contiguity which implies common border and hence proximity, emerged to have positive and stronger impact on goods exports than on service exports which is little inconsistent with the previous result.²⁹ GSP has surprisingly no impact on services exports while it has a negative impact on goods exports. The time zone difference although has significant negative impacts for both types of exports but surprisingly it has a dominant negative impact on goods exports. This implies that although sign remains unchanged but the magnitudinal impact changes with change in specification. In relating the impact of exchange rate regime with exports there are some consistencies with the previous results. When one or both of the trading partners are under a fixed exchange rate regime, it significantly discourages only goods exports. When one of the trading partners is under a managed exchange rate regime, it promotes both types of exports but inconsistent without the previous result, it promotes more services exports than goods exports. In sharp contrast to the previous result, when both the trading pairs are under a purely flexible exchange rate regime, it yields a stronger positive effect on service exports and no impact on goods exports.

The results relating to the effects of infrastructural variables (mobile subscribers, telephone lines and internet use including electricity consumption) for establishing the trade connection between the countries are almost consistent with the previous result.³⁰ The results suggest that there is scope for improving both services and goods exports through higher penetration of internet use and other communication and technological infrastructures. Other parameters relating to the rule of law, passengers arrived, and tariffs are also almost consistent with the previous results.

The inclusion of proportion of cross-country bilateral stock of immigrants in the cross section panel OLS estimates for both services and goods export equations are reported in columns 3 & 4 respectively. In contrast to our time series panel OLS results, the income parameters along with rule of law, GSP, exchange rate regime and internet use show inconsistencies with regard to their significances, while there are certain consistencies with regard to distance, exchange rates and average tariff rates in the importing countries etc.. However, the bilateral immigration link both in the exporting and importing countries yields almost similar previous results implying that the traditional link through immigration by drastically reducing the sunk cost through reducing the

²⁸ Without accounting for the complementarity impact of services exports on goods exports, depreciation adversely affects the goods exports from middle to poor and positively influences exports from poor to middle, middle to middle and rich to middle income countries.

²⁹ Comparing this results with the model without inclusion of complementarity effects, It is also seen that with inclusion of complementarity effects in both goods and services exports equations, it significantly reduces the role of distance, common language, common currency, colonial link, contiguity and membership in regional free trade agreements without affecting much the magnitude of other coefficients.

³⁰ Higher is the proportion of internet users both in the exporting and importing countries helps to promote exports in services and goods and stronger is the impact on services exports than goods. Once the complementarity effect is incorporated in goods exports equation, increased proportion of internet users only in the exporting countries' helps to boost goods exports as the same for importing countries loses its significance.

role of distance mainly helps to promote service exports and to some extent the goods exports as well.³¹ Similar is the result with regard to the sign in the consistency of other parameters with the cross panel estimates for 2009 with the inclusion of human capital formation reported in columns 5 & 6 in Table 2. It shows that more years of post-secondary education in the importing country discourages service exports from others as skilled population can enable themselves to produce and offer lots of services and at the same time, the same education variable in the exporting countries do not lead to more exports of services or goods to others implying higher education leads to higher services consumption.

Table 2: Panel OLS Regression Estimates with Income Classification for Importers and Exporters

VARIABLES	(1) log of services exports	(2) log of goods exports	(3) log of services exports	(4) log of goods exports	(5) log of services exports	(6) log of goods exports
log of goods exports	0.336*** (25.00)		0.225*** (4.892)		0.323*** (12.49)	
log of services exports		0.237*** (25.07)		0.150*** (5.232)		0.255*** (12.60)
log of low income1	1.012*** (3.627)	0.520** (2.222)	-0.168 (-0.0722)	-1.335 (-0.723)	0.255 (0.332)	0.927 (1.368)
log of middle income1	1.219*** (3.651)	0.699** (2.496)	-0.599 (-0.156)	-2.558 (-0.837)	0.272 (0.290)	1.181 (1.425)
log of high income1	2.438*** (7.328)	0.385 (1.376)	-1.419 (-0.355)	-3.060 (-0.964)	-0.831 (-0.685)	1.336 (1.245)
log of low income2	0.645*** (2.880)	0.389** (2.078)	-2.258* (-1.662)	-2.290** (-2.127)	0.794 (1.160)	0.363 (0.601)
log of middle income2	-0.0377* (-1.953)	0.0349** (2.152)	0.0246 (0.547)	-0.00198 (-0.0556)	0.0187 (0.440)	0.0113 (0.300)
log of high income2	0.0925* (1.896)	0.0769* (1.881)	0.183 (0.607)	0.165 (0.691)	0.0391 (0.690)	0.0513 (1.025)
log of population density1	-1.265* (-1.882)	0.238 (0.423)	0.157 (0.607)	0.862*** (4.212)	1.187 (0.627)	-1.362 (-0.815)
log of population density2	-0.148*** (-2.945)	0.00693 (0.164)	11.06* (1.855)	12.80*** (2.711)	-0.102 (-1.579)	-0.0144 (-0.252)
log of capital distance hh	-0.357*** (-8.724)	-0.650*** (-19.60)	-0.247* (-1.912)	-0.607*** (-6.233)	-0.332*** (-4.093)	-0.650*** (-9.422)
log of capital distance hm	-0.899*** (-8.412)	-0.723*** (-8.069)	-1.149*** (-2.712)	-0.873*** (-2.595)	-1.000*** (-4.819)	-0.630*** (-3.430)
log of capital distance hl	-1.074*** (-13.23)	-0.719*** (-10.53)	-1.044*** (-3.106)	-0.475* (-1.774)	-1.279*** (-7.932)	-0.657*** (-4.567)
log of capital distance mh	-1.095*** (-10.44)	-0.839*** (-9.529)	-0.952** (-2.330)	-1.110*** (-3.440)	-1.085*** (-5.104)	-0.750*** (-3.990)
log of capital distance lh	-0.980*** (-11.29)	-0.415*** (-5.669)	-0.896*** (-2.593)	-0.189 (-0.687)	-1.127*** (-6.923)	-0.384*** (-2.651)
log of real exchange rate hh	0.0700*** (4.266)	-0.0214 (-1.552)	0.0703 (1.402)	-0.0406 (-1.021)	0.100** (2.565)	-0.0214 (-0.619)
log of real exchange rate hm	0.0229 (0.999)	-0.00894 (-0.466)	0.0453 (0.611)	-0.00621 (-0.106)	0.0629 (1.302)	-0.0453 (-1.060)
log of real exchange rate hl	0.0242 (1.513)	-0.0652*** (-4.872)	0.0437 (1.114)	-0.0737** (-2.377)	0.0570* (1.757)	-0.0786*** (-2.742)
log of real exchange rate mh	0.170*** (7.489)	-0.0476** (-2.495)	0.183** (2.446)	-0.0553 (-0.927)	0.216*** (4.128)	-0.0589 (-1.268)
log of real exchange rate lh	0.143*** (6.083)	-0.0470** (-2.386)	0.154** (2.045)	-0.0419 (-0.699)	0.195*** (3.742)	-0.0336 (-0.727)
common currency	0.276*** (5.185)	0.199*** (4.572)	0.152 (0.964)	0.134 (1.100)	0.278*** (2.610)	0.202** (2.175)
colonial link	0.535***	0.223***	0.183	0.134	0.498***	0.297***

³¹ This is seen by dropping the immigration link variable which shows there is increase in magnitude of the distance coefficient in absence of immigration link. The results are not reported for sake of brevity.

	(9.881)	(4.910)	(1.083)	(1.007)	(4.551)	(3.079)
Free Trade Areas in Services	0.341***		0.795***		0.426***	
	(7.280)		(3.977)		(4.089)	
Free Trade Areas in Goods		0.333***		0.722***		0.396***
		(9.426)		(5.065)		(4.927)
General Scheme of Preferences	0.0421	-0.231***	-0.335	-0.115	0.0635	-0.234*
	(0.520)	(-3.403)	(-1.265)	(-0.544)	(0.397)	(-1.653)
Contiguity	0.423***	0.519***	-0.221	0.241	0.532***	0.582***
	(4.502)	(6.596)	(-0.686)	(0.945)	(2.810)	(3.480)
Common official language	0.406***	0.193***	0.279**	0.315***	0.467***	0.0511
	(9.217)	(5.202)	(1.995)	(2.852)	(5.246)	(0.644)
log of absolute time zone differences	-0.138***	-0.0833***	-0.0289	-0.0692	-0.0781	-0.0742
	(-4.375)	(-3.087)	(-0.286)	(-0.823)	(-1.225)	(-1.279)
log of rule of law1	0.0765	0.130	12.19	24.30	0.271	0.0980
	(0.258)	(0.521)	(0.654)	(1.635)	(0.251)	(0.103)
log of rule of law2	1.260***	-0.482**	-159.4**	-133.7**	1.171	0.0526
	(4.575)	(-2.086)	(-2.027)	(-2.147)	(1.131)	(0.0575)
log of air passengers arrived1	0.106**	-0.0176	-0.126	-2.892	0.000724	-0.0241
	(2.550)	(-0.506)	(-0.0443)	(-1.279)	(0.00777)	(-0.292)
log of air passengers arrived2	0.0546	0.00400	2.014*	2.172**	-0.00496	-0.117
	(1.316)	(0.115)	(1.834)	(2.496)	(-0.0562)	(-1.502)
log of internet user1	0.116*	0.0575	3.843	8.067	-0.00494	0.138
	(1.920)	(1.132)	(0.531)	(1.398)	(-0.0215)	(0.679)
log of internet user2	0.165***	0.0955*	-52.49**	-46.55**	-0.0403	0.193
	(2.800)	(1.929)	(-1.995)	(-2.233)	(-0.183)	(0.988)
log of mobile subscriber1	0.0165	0.119**	-13.56	-29.56	0.0224	0.370**
	(0.277)	(2.375)	(-0.488)	(-1.338)	(0.111)	(2.082)
log of mobile subscriber2	-0.130**	0.0680	45.71**	32.52*	0.0949	-0.107
	(-2.502)	(1.562)	(1.967)	(1.766)	(0.498)	(-0.636)
log of number of telephone lines1	-0.184**	-0.0425	-18.21	-40.46	-0.105	-0.115
	(-2.235)	(-0.616)	(-0.501)	(-1.398)	(-0.448)	(-0.558)
log of number of telephone lines2	-0.287***	-0.0694	127.0**	104.1**	-0.0559	-0.426**
	(-3.695)	(-1.064)	(1.998)	(2.068)	(-0.256)	(-2.210)
log of average tariffs1	-0.0203	-0.134***	-9.141	-21.82	-0.0541	0.0650
	(-0.335)	(-2.645)	(-0.481)	(-1.444)	(-0.222)	(0.302)
log of average tariffs2	0.00691	-0.126**	53.95**	39.46*	-0.0110	-0.169
	(0.118)	(-2.567)	(2.053)	(1.896)	(-0.0493)	(-0.858)
log of immigrant proportion1			0.180***	0.0565**		
			(5.618)	(2.190)		
log of immigrant proportion2			0.135***	0.0199		
			(4.239)	(0.775)		
log of average years of post secondary education1					-0.910**	0.209
					(-2.031)	(0.526)
log of average years of post secondary education2					-0.706	0.520
					(-1.586)	(1.320)
Constant	-27.58***	1.623	-901.7	-342.4	14.80	-3.693
	(-5.096)	(0.357)	(-1.242)	(-0.594)	(0.730)	(-0.206)
Observations	7,407	7,407	828	828	1,903	1,903
R-squared	0.872	0.906	0.888	0.923	0.868	0.904

Note: t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1,

1 and 2 indicate importing and exporting countries respectively. All the above models are estimated with country and time specific dummy coefficients, however these coefficients are deleted from the above table for reason of space constraint.

Log of population density, one under managed exchange rate regime, One under fixed exchange rate regime, One under managed and one under free float exchange rate regime, Both under managed exchange rate regime, Both under free float exchange rate regime, log of secure server, log of electricity consumption, log of broadband subscribers and log of average years of secondary education are used as controlled variables for both the importers and exporters in each of the above models but owing to space constraint and finding them mostly insignificant dropped out reporting from the above results.

As most of the variables such as distance, common currency, common language, membership in regional free trade agreements, colonial link and technological indicators are observed to have consistently similar impacts on services and goods exports in Table 3, the paper emphasizes here on the product of income elasticity and exchange rate elasticity of exports.

In line with Linder's hypothesis and within the spirit of gravity model, to test whether countries grouped under similar pattern of per capita incomes, do their increased incomes allow them to intensively trade more with each other than the countries with dissimilarity in per capita income classes, the product of income levels are paired into 5 categories on the basis of their per capita income classes. This is done similar to the exchange rate and distance variables' pairings in the above Table 2. The estimates in Table 3 shows that irrespective of similarity and dissimilarity in per capita incomes between trading pairs, the product of incomes in all cases have significant positive impacts on goods and services exports but the income product elasticity of both services and goods exports corresponding to similar income trading country pairs especially when export is from high to high income countries, is lesser than the income product elasticity for the dissimilar trading country pairs.³² This implies that countries with dissimilarity in income also trade intensively than the countries with similar level of per capita incomes. Although this is within the spirit of gravity model but it goes against the spirit of the Linder's proposition along with contradicting other previous studies' findings (Martinez-Zarzoso & Nowak Lehmann, 2003).

As observed from previous two models, the exchange rate depreciation with few exceptions is consistently and largely seen to encourage services exports while it discourages goods exports especially from high and middle income countries. Among various combinations or pairs of exporters and importers classified on the basis of their per capita incomes, exchange rate depreciation produces significant positive effects on services exports for all country pairs except one situation (when export is from high to middle countries) as seen above. Exchange rate depreciation, although encourages service exports from most of the countries but significantly and dominantly encourages services exports from middle to high and poor to rich countries.³³

In contrast, for goods exports, the sign and significances of the exchange rate coefficients remain consistent in the model even without accounting for the complementarity effects of services on goods exports. The same exchange rate coefficients are mostly found to be significant in Table 3 similar to Table 2. However, in overall this shows that with currency depreciation, the high income countries are significantly and dominantly discouraged to export goods to poor income countries, and similarly, depreciation also discourages goods exports from middle to rich and poor to rich income countries. This implies that while depreciation can be a strategy for the exporters to promote service exports but the same strategy may not aid them in enhancing goods exports. Therefore, policy makers have to be very cautious about whether a country would have to rely on depreciation as a strategy for achieving service export-led growth or goods export-led growth. This may be there is some degree of incompetitiveness for the rich exporters which bids up their price levels as a result depreciation mechanism does not work to promote their exports.

³² In particular, the income product is found to have positive impact only in one case for service exports when services are exported from poor to middle income countries and in four cases for goods exports when goods are exported from rich to poor, middle to middle, middle to poor and poor to middle income countries.

³³ Given higher income propensity of services imports of poor countries observed previously, why depreciation discourages services exports from middle income countries, is difficult to explain unless more number of countries under this category are included and examined and this specific country situation is studied in depth.

Ad similarly, if poor countries have emerged as major exporters, there might be other competitive factors which are driving their goods exports and not their currency depreciation.

Table 3: Panel Regression Estimates with Income Classification for Trading Country Pairs

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	log of services exports	log of goods exports	log of services exports	log of goods exports	log of services exports	log of goods exports
log of goods exports	0.324*** (23.88)		0.218*** (4.715)		0.316*** (12.13)	
log of services exports		0.225*** (23.95)		0.143*** (4.965)		0.246*** (12.21)
log of income products hh	0.412*** (4.772)	0.236*** (3.288)	0.147 (0.489)	0.144 (0.605)	0.137 (0.721)	0.216 (1.293)
log of income products hm	0.482*** (5.494)	0.311*** (4.246)	0.292 (0.957)	0.157 (0.652)	0.198 (1.033)	0.292* (1.728)
log of income products hl	0.484*** (5.522)	0.388*** (5.311)	0.228 (0.747)	0.279 (1.157)	0.181 (0.947)	0.364** (2.161)
log of income products mh	0.498*** (5.629)	0.310*** (4.202)	0.195 (0.633)	0.238 (0.978)	0.210 (1.083)	0.280 (1.641)
log of income products lh	0.512*** (5.802)	0.325*** (4.414)	0.195 (0.635)	0.212 (0.873)	0.229 (1.188)	0.286* (1.683)
log of population density1	0.410 (0.659)	0.370 (0.716)	-13.68 (-0.863)	-16.06 (-1.288)	0.816 (0.443)	-0.950 (-0.586)
log of population density2	-0.126** (-2.498)	0.0271 (0.648)	-19.88 (-1.319)	-14.35 (-1.208)	-0.0820 (-1.259)	0.0184 (0.320)
log of capital distance hh	-0.372*** (-9.045)	-0.652*** (-19.71)	-0.241* (-1.870)	-0.601*** (-6.198)	-0.341*** (-4.191)	-0.650*** (-9.419)
log of capital distance hm	-0.973*** (-9.076)	-0.785*** (-8.793)	- 1.139*** (-2.687)	-0.928*** (-2.771)	-1.053*** (-5.067)	-0.694*** (-3.785)
log of capital distance hl	-1.130*** (-13.87)	-0.775*** (-11.39)	- 1.071*** (-3.189)	-0.488* (-1.830)	-1.315*** (-8.135)	-0.725*** (-5.050)
log of capital distance mh	-1.161*** (-11.03)	-0.903*** (-10.29)	-0.976** (-2.393)	-1.139*** (-3.548)	-1.126*** (-5.296)	-0.804*** (-4.288)
log of capital distance lh	-1.028*** (-11.83)	-0.447*** (-6.148)	- 0.907*** (-2.628)	-0.221 (-0.807)	-1.154*** (-7.091)	-0.423*** (-2.934)
log of real exchange rate hh	0.0670*** (4.069)	-0.0185 (-1.351)	0.0723 (1.438)	-0.0400 (-1.007)	0.0957** (2.455)	-0.0146 (-0.424)
log of real exchange rate hm	0.0305 (1.328)	-0.000265 (-0.0138)	0.0605 (0.814)	-0.00506 (-0.0859)	0.0686 (1.414)	-0.0324 (-0.757)
log of real exchange rate hl	0.0304* (1.884)	- 0.0487*** (-3.631)	0.0507 (1.277)	-0.0591* (-1.885)	0.0608* (1.869)	-0.0611** (-2.131)
log of real exchange rate mh	0.152*** (6.670)	- 0.0529*** (-2.775)	0.181** (2.409)	-0.0643 (-1.079)	0.205*** (3.907)	-0.0591 (-1.276)
log of real exchange rate lh	0.131*** (5.566)	- 0.0550*** (-2.801)	0.147* (1.946)	-0.0496 (-0.829)	0.181*** (3.481)	-0.0356 (-0.777)
common currency	0.240***	0.161***	0.133	0.116	0.257**	0.170*

	(4.489)	(3.711)	(0.848)	(0.955)	(2.409)	(1.833)
colonial link	0.519***	0.206***	0.189	0.127	0.485***	0.272***
	(9.565)	(4.566)	(1.120)	(0.957)	(4.424)	(2.826)
Free Trade Areas in Services	0.332***		0.753***		0.383***	
	(7.156)		(3.739)		(3.703)	
Free Trade Areas in Goods		0.312***		0.682***		0.351***
		(8.909)		(4.761)		(4.367)
General Scheme of Preferences	0.0204	-0.251***	-0.367	-0.130	0.0474	-0.253*
	(0.252)	(-3.722)	(-1.383)	(-0.616)	(0.296)	(-1.798)
Contiguity	0.427***	0.555***	-0.188	0.305	0.543***	0.609***
	(4.524)	(7.081)	(-0.583)	(1.193)	(2.862)	(3.652)
Common official language	0.416***	0.204***	0.281**	0.317***	0.473***	0.0623
	(9.429)	(5.546)	(2.012)	(2.890)	(5.326)	(0.790)
log of absolute time zone differences	-0.103***	-0.0530**	-0.0130	-0.0495	-0.0564	-0.0499
	(-3.225)	(-1.963)	(-0.128)	(-0.589)	(-0.881)	(-0.860)
log of rule of law1	0.549*	0.204	33.80	60.29	0.383	0.0998
	(1.949)	(0.869)	(0.587)	(1.327)	(0.361)	(0.107)
log of rule of law2	1.082***	-0.589**	43.36	58.61	1.069	0.00619
	(3.912)	(-2.556)	(0.774)	(1.325)	(1.041)	(0.00684)
log of internet user1	0.165***	0.0658	18.81	28.40	0.0241	0.206
	(2.763)	(1.325)	(0.697)	(1.334)	(0.118)	(1.146)
log of internet user2	0.171***	0.111**	26.18	26.38	0.0404	0.215
	(2.913)	(2.267)	(1.012)	(1.294)	(0.205)	(1.232)
log of air passengers arrived1	0.108***	-0.0186	-1.290	-3.332	0.0281	-0.0467
	(2.617)	(-0.542)	(-0.489)	(-1.606)	(0.320)	(-0.603)
log of air passengers arrived2	0.0659	0.0118	-2.951	-2.131	0.00364	-0.106
	(1.596)	(0.343)	(-1.181)	(-1.083)	(0.0414)	(-1.374)
log of mobile subscriber1	-0.0130	0.156***	-0.585	-10.09*	0.0442	0.443***
	(-0.259)	(3.742)	(-0.0862)	(-1.882)	(0.264)	(3.016)
log of mobile subscriber2	-0.123***	0.0623	2.651	-10.32*	0.174	-0.109
	(-2.577)	(1.563)	(0.360)	(-1.780)	(1.090)	(-0.777)
log of number of telephone lines1	-0.322***	-0.0778	-35.59	-60.99	-0.126	-0.131
	(-4.123)	(-1.196)	(-0.656)	(-1.425)	(-0.546)	(-0.646)
log of number of telephone lines2	-0.233***	-0.0551	-45.29	-57.66	-0.0350	-0.417**
	(-3.042)	(-0.865)	(-0.861)	(-1.388)	(-0.161)	(-2.188)
log of average tariffs1	0.0661	-0.124**	2.468	-7.959	-0.125	0.143
	(1.121)	(-2.533)	(0.380)	(-1.554)	(-0.553)	(0.716)
log of average tariffs2	-0.0188	-0.142***	6.133	-8.495	-0.0377	-0.206
	(-0.321)	(-2.920)	(0.856)	(-1.508)	(-0.170)	(-1.053)
log of immigrant proportion1			0.181***	0.0523**		
			(5.632)	(2.025)		
log of immigrant proportion2			0.130***	0.0171		
			(4.036)	(0.667)		
log of average years of post secondary education1					-0.888**	0.312
					(-2.104)	(0.839)
log of average years of post secondary education2					-0.577	0.517
					(-1.378)	(1.401)
Constant	-5.760*	0.0935	451.3	879.6*	-3.950	8.164

	(-1.664)	(0.0325)	(0.791)	(1.956)	(-0.428)	(1.007)
Observations	7,407	7,407	828	828	1,903	1,903
R-squared	0.872	0.908	0.888	0.924	0.868	0.905
<p>Note: t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1, 1 and 2 indicate importing and exporting countries respectively. All the above models are estimated with country and time specific dummy coefficients, however these coefficients are deleted from the above table for reason of space constraint.</p> <p>Log of population density, one under managed exchange rate regime, One under fixed exchange rate regime, One under managed and one under free float exchange rate regime, Both under managed exchange rate regime, Both under free float exchange rate regime, log of secure server, log of electricity consumption, log of broadband subscribers and log of average years of secondary education are used as controlled variables for both the importers and exporters in each of the above models but owing to space constraint and finding them mostly insignificant dropped out reporting from the above results.</p>						

Robustness of Result Estimates

As regulatory policies influence economic activities and so also trade, studies suggest that without the inclusion of measures of national regulatory policies of countries, it may bias the results. Therefore, in order to verify the robustness of our results, we tried to estimate all three variants of the gravity model by substituting alternative proxies for the regulatory measures. However, the results using all three variants could not be provided for all due to space constraint. To examine the impact of regulatory norms, similar to Kimura and Lee (2006), the study used measure of restrictiveness viz. Economic Freedom of World Index (EFWI) provided by Fraser Institute and also alternatively with Index of Economic Freedom (IEF) compiled by Heritage Foundation instead of OECD's product market regulation index and Australian Productivity Commission's Services Trade Restrictive indices as latter two are sectoral indices. Further, as economic freedom index is likely to be correlated with the rule of laws considered in our analysis, therefore, rule of laws of importing and exporting countries are replaced with these economic freedom indices respectively.³⁴ The result for model 3 (different trading pairs of importing and exporting countries) is only reported in Table 4 with the use of chain sum EFWI. It shows that estimates are almost similar and robust comparing with the preceding results obtained for other parameters without the inclusion of EFWI reported in Table 1. It also shows that with an increased economic freedom of only importing countries, there is a significant increase in only services exports from other countries and no impact on goods exports. This is in contrast with Kimura and Lee (2006)'s findings which presents that economic freedom of both the importing and exporting countries promote both services and goods exports and rule of law of the exporting countries showed in the above encourages services exports and discourages goods exports.³⁵

With further replacement of Fraser's Economic Freedom of World Index, it is seen that the index of economic freedom of the goods importing countries although turned out to be significant but the sign is negative for goods exports while it is not significant for services exports. Thus, it tends to point out that increased economic freedom in the importing countries while does not

³⁴ Rule of law and Economic Freedom indices are likely to be highly correlated in view of overlapping areas in accounting those. When laws are stringent for checking anti-competitive behavior of firms, eliminating any bad practices of firms and individual entrepreneurs, it gives economic freedom for those who cannot recourse to such strategies. Observing high correlation of the rule of laws with both Economic Freedom Indices from simple pair-wise correlation which varies from .77 to .88, we alternatively replaced both indicators each with other in the model without their simultaneous inclusion.

³⁵ In order to make the Heritage Foundation's Index of Economic Freedom to be comparable with Fraser Institute's EFWI, Kimura and Lee (2006) took the inverse of Heritage Foundation's index and multiplied by 10 and incorporated without taking logarithm values of these indices. While our study takes logarithm values of reported indices values. However, without logarithm values it is seen that it does not alter our result.

significantly encourage services exports from other exporting countries, the same discourages goods exports. This leads to result inconsistency between two different indices especially with regard to the goods export equation, without affecting the sign and significance of other parameters. This signifies to the conceptual differences among different measures of economic freedom leading to such inconsistencies. However, given the inconsistencies with regard to the sign of Economic Freedom indices, it is seen that incorporation of these indices hardly matters as far as sign and significance of the other parameters are concerned. Similar is the result from other two variants of the gravity model which shows that other parameters are largely unaffected with the incorporation of the economic freedom indices. Therefore, one can still rely on our fixed effect OLS parameter estimates obtained for other parameters.³⁶

In order to further check on robustness of the results, the real exchange rate was replaced with the nominal exchange rate. No large variation in result estimates is observed as they are found to be most consistent in terms of their sign and significances for similar specifications for all country pairs. Besides, all the models discussed are also estimated through PPML model of Silva & Tenreyro (2006) and there is no major change in results estimates except the changes in magnitude of the coefficients, ensuring the robustness of parameters obtained. These results are not produced for sake of brevity but can easily be accessible on request. However, comparing the effects of real exchange rate of two emerging economies in all three models, it shows that exchange rate depreciation of Indian rupee significantly promotes services and goods exports while the Chinese Yuan has significant positive impact on services exports and no major impact on its goods exports. The latter is quite surprising as it goes contrary to the recent debate surrounding to the Chinese currency being artificially depressed at a lower value for promoting Chinese exports in goods and services. This result is produced in Table 5 based on the model 3. When the level of income is replaced with per capita incomes in the model (Table 6), it does not also bring any major change in the result estimates.

Considering the cross sectional regressions for all specifications, the cross flow of proportion of immigrants between the trading countries is consistently found to have significant and positive influence both on goods and services exports and its effect is stronger for services exports than goods exports. This is in contrast to the results obtained by Gould (1994) for the USA and its trading partners which found that immigration link has a relatively stronger positive impact for USA's goods exports than USA imports. This is also seen to effectively reducing the influence of distance on services exports compared to its role on goods exports. The effect of education variables although is not yielding consistent results for other parameters in different gravity models, however there are certain consistencies observed with regard to its own parameters. Moreover, the cross sectional parameters do not yield consistent parameter estimates in this study unlike existing studies including Grunfeld & Moxnes (2003), Kimura and Lee (2006) and Kandilov and Grennes (2007).

Conclusion and Policy Suggestions

³⁶ Incorporating differences in exporting and importing countries' rule of laws and various Economic Freedom Indices with variants of gravity models did not produce any significant change of results except finding of an insignificant coefficient of the difference in indices terms. This tends to say that policy differences do not matter. But this finding is rudimentary unless it is deeply studied.

We estimated three variants of gravity model of trade using fixed panel OLS technique on the most recent available panel time series data on goods and services exports for a heterogeneous group of countries during 2002-09.

As our main interest is on the role of exchange rate, to clearly see the relative role of exchange rate on both services and goods exports, the exchange rate impact is initially separated into three categories on the basis of exporters' per capita income into low, middle and rich per capita income countries with our aggregative equation irrespective of their exporters' income classes and latter into 5 categories for different trading country pairs on the basis of their per capita income classes of both the partners in the pair with the available intra-country trade data. It is seen that exchange rate depreciation in general for all per capita country classes has significant positive influence on services exports and, mostly and surprisingly has negative influence on goods exports. The positive effect is stronger for services exports than negative effects on goods exports. Among the three types of exporting countries on the basis of exporter's per capita incomes, currency depreciation of middle income countries' has a dominant positive impact on services exports and has a negative dominant impact on rich countries' goods exports followed by other countries.

In contrast, similar is the effect of currency depreciation on both exports, considering different trade pairs. The middle income countries as exporters, comparing with other countries, their currency depreciation has a dominant positive impact on their services exports than negative impact on their goods exports and rich countries currency has a dominant negative impact on goods exports. As the positive impact of depreciation is consistently found to have stronger impact on services exports for almost all country pairs except few pairs than the negative impact on goods exports, this implies that currency depreciation helps countries to boost services exports while the same adversely impacts on goods exports. This suggests that the countries heavily relying on services exports than goods exports can recourse to depreciation strategies for promoting their export revenues. Since results show depreciation strongly and majorly benefits the middle income countries than poor emerging and rich countries in services exports, this strategy might have lifted them either from poor per capita income to attaining middle per capita income or from middle income to recently becoming rich countries. However, comparing the effects of real exchange rate of two emerging economies such as India and China, in all three models, it shows that exchange rate depreciation of Indian rupee significantly promotes services and goods exports while the Chinese Yuan has significant positive impact on services exports and no major impact on its goods exports. The latter is quite surprising as it goes contrary to the recent debate surrounding the Chinese currency being artificially kept depressed for promoting Chinese exports in goods and services.

This implies that while depreciation can be a strategy for the exporters to promote service exports but the same strategy may not aid all the countries in enhancing their goods exports. This outcome may be due to different reasons. One reason could be that goods exports are import intensive while services exports are not. For instance, if goods exporting countries substantially require to import raw materials and intermediate services for production of their final exportables, depreciation strategy is going to be costly for the exporting firms rather than yielding profits for their business and hence discourages their exports. This phenomenon for goods could be described as due to holding of J-curve hypothesis. Another reason could be that

even if the purchasing power parity holds in the long-run, but due to temporary fluctuation of exchange rates as reflected from the depreciation of exchange rate, it brings uncertainty element in business climate and therefore tends to discourage goods exports. Therefore, policy makers have to be very cautious about whether a country would have to rely on depreciation as a strategy for achieving service export-led growth or goods export-led growth. Given the positive dominant effect of depreciation of exchange rate on services exports than its negative influence on goods exports in general, if an economy is labour intensive in its production and abundant with high skilled manpower, it can perhaps be suggested to adopt depreciation strategy in order to be more competitive and promote its services exports than goods exports. If that is not the case, at the same time, it is not suggestible to say to recourse on to the same depreciation strategy as an instrument for promoting goods exports as depreciation is seen to impede goods exports. However, given that income elasticity of services exports is higher for poor countries than their income elasticity of goods exports, depreciation of poor countries' currency per unit of middle and rich income countries' currency may largely benefit the poor countries and may reduce their higher income elasticity of net services imports.

While examining the effects of different exchange rate regimes, it is mostly seen that when only one of the countries in the trading pairs is under a managed exchange rate regime irrespective of its other trading partners' exchange rate regime (other than managed exchange rate regime) is consistently seen to have more favourable impact on services trade than goods trade. When only one of the trading pairs or both the trading pairs are under a fixed exchange rate regime, it mostly discourages goods exports from one to the other (only with the model on the basis of income division for countries) without implication for services exports. In exceptional cases, it is also seen that when both the trading countries are under a pure exchange rate it promotes more services exports than goods exports.

As postulated by gravity model, this study empirically also reinforces previous studies' findings that aggregative income product positively and distance negatively influence bilateral services and goods exports between countries. And further both the product of income and product of per capita incomes considered separately in similarly separate models show their strong influences on services exports than goods exports. However, more interesting pictures are gleaned when gross income and per capita income of countries are separated on the basis of their individual per capita income classes in separate model. Examining the income elasticity of exporters and importers separately on the basis of countries' per capita income classes into poor, middle and rich, it indicates that income elasticity of services imports in general is relatively stronger for all countries than their goods imports and increased incomes have negligible impact on both goods and services exports for rich countries while increased incomes significantly lead to increase in services exports for poor countries and the same does lead to goods exports for the middle and poor income countries but not for rich countries.³⁷ In overall, the income elasticity implied that increased income is inducing countries to import more services than goods. Similar result is also observed by substituting per capita income of countries with their levels of incomes.

Further, when the product of incomes of trading country pairs is differentiated on the basis of different combinations of per capita incomes classes, the product of income elasticity effects of

³⁷ Among the importers increased income has the strongest impact on services imports for the rich countries, while among the exporters, increased income has a strongest impact on services exports for the poor countries.

services and goods exports are found to be consistent with the prediction of the gravity models. For most of the country pairs, the product of income elasticity is found to be positive for both services and goods exports. Similar is the case with the substitution of per capita incomes in place of gross incomes. However, this does not provide the evidence that the countries with similar levels of per capita incomes intensively trade with each other than dissimilar per capita income countries. Rather, it provides the evidence that the countries with dissimilar incomes also trade more intensively than the similar per capita income countries.

To verify Linder's proposition, the study in line with previous studies also incorporated log of per capita income differences between the importers and exporters as a variable into the export model with aggregative income product equation, the study tried to contrast its findings with other previous studies. It observed from its coefficients that with an increased per capita income differences of importers from exporters, there is a rise in both services and goods exports from exporting countries and its influence is stronger for services exports than goods exports. It attributed the latter result to, as services industries preferably employ more skilled labor who claim relatively higher wages in countries with relatively higher per capita incomes than the wages claimed by labors relatively in low per capita income countries, the higher per capita income countries tend to import more services from the low per capita income exporters for reducing their costs. This might be the reason of recent growth of outsourcing activities by the rich countries to poor countries. Although our study contradicts Linder's hypothesis that similar income countries do promote more trade between them than dissimilar income countries, but this finding reinforces the findings of Kandilov and Grennes (2007). It tends to say that when wages are relatively higher in exporting countries than importing countries as reflected from their per capita income differences of exporting countries from importing countries, lower would be the services exports from rich countries and higher would be the exports from poor countries.

The overall aggregative distance measure as a trade cost factor points out that distance in overall matters more for goods exports than for services exports, implying distance reflects higher cost of transportation in goods than services. However, when trading countries are paired on the basis of their per capita income classes, distance coefficients for all trading pairs found to be consistently negative but its magnitudinal effect is not consistent for goods and services exports for all pairs. In overall, it is very hard to draw whether distance matters more for goods or more for services consistently for all country trading pairs. But with certain degree of consistency, the results shows that when exports are from rich to rich countries, distance matters for goods exports than services exports and if poor or middle income country is one of the trading partners either with middle or rich countries, often distance matters for services exports than goods. The study tried to indicate that it could be due to poor quality of technologies and infrastructures services facilities in poor and middle income countries which might be raising the transaction cost in services trade compared to their transportation cost in goods trade in view of lesser wages reflected from poor countries' low per capita incomes. Further, it shows that incorporation of infrastructural and other link variables such as internet user, immigration link, colonial link, common language, contiguity marginalized the role of distance but distance still matters for both goods and services exports. This implies there is no death of distance on account of communication links established through modern infrastructural services. Given that poor countries have also higher marginal propensity to exports in services out of their increased

incomes, if there can be more investment on improving the quality of infrastructures it would result in improving their exports to other countries and potentially contributing to their growth.

Mostly the complementary effect of goods exports on services exports is stronger than the complementary effects of services exports on goods exports implying goods trade sector might be utilizing more services than services trade utilizing or leading to more goods trade. The inclusion of this complementarity effects, although it further shows that there is drastic reduction in the magnitude of the distance coefficients for both goods and services exports but this drastic reduction in distance effect is more in services exports than in goods exports along with drastically reducing the effects of common language, colonial link, and contiguity more in services exports than goods exports. This indicates the larger effect of the cultural and historical linkages captured in goods exports has increasingly impacted the services exports than the information link captured in modern services impacting the goods exports. Thus this larger reduction in the effect of distance on services exports than goods exports may imply higher transportation cost but lower sunk cost involved in goods trade than in services trade. In services exports, it could be historical and cultural linkages captured in the complementarity effects reduce the sunk cost, while in goods exports, it is the modern services by globally integrating the markets, reduces the sunk cost. We also found internet use leads to more services exports than goods exports. Given that distance imposes greatest barrier in exporting services from the poor countries, the study suggests for more attention and measures in direction of technological upgradation and more trade infrastructures for poor countries for promoting their services exports to other countries.

It is seen that membership in regional free trade agreements significantly matters in respective areas of trade such as goods and services along with the role of common language, colonial link, contiguity, and common currency. Most often these factors are seen to strongly facilitate services exports than goods exports. This implies that countries with relative advantage in exporting more services should engage in reasonable regional trading arrangements for their maximum benefits out of trade, however, they should go for it simultaneously without neglecting the negotiations in the area of goods trade. Surprisingly, GSP treatments by the developed importing countries promote services trade than goods trade. However, there are certain inconsistencies with regard to this parameter estimate leading to mixed findings.

The rule of law in the exporting countries promotes services exports while the same surprisingly adversely affects the goods exports. However, it has a stronger role for services exports than goods exports. Thus, due to rule of law, there exists a trade-off between services trade against goods trade in the exporting countries. While replacing various economic freedom indices with rule of law in order to proxy for liberal national regulatory systems, without affecting the consistency of other parameters it yields mixed results for services exports while it does not have any effect on goods exports. However, when we replace with differences in economic freedom indices as a measure of differences in regulatory system between countries, it is found to be insignificant unlike OECD (2009) study results. This suggests improving on measure of trade barriers to trade instead of using economic freedom index as a proxy for the same. When the nominal exchange rate is replaced with the real exchange rate in all models, there are no much observed variations in result estimates as most of the parameters are found to be consistent in terms of their signs and significances. The results discussed are found to be robust with the

substitution of different variables and by estimating with PPML model of Silva & Tenreyro (2006). The inclusion of immigration and education variables in the cross section panel data although shows some consistency with regard to their own parameters however, it does not enable to produce much sensible significant parameters for other gravity factors in the models.

Although the current study is first of its kind in its attempt to give major emphasis on role of exchange rate along with other relevant determinants of bilateral goods and services exports, however, it has several limitations. By focusing on aggregate exports of goods and services, it could not distinguish different kinds of services exports as services trade are more heterogeneous than goods trade as far as their nature of movement and services delivery are concerned. The future studies can attempt in this direction of studying the exchange rate impact on different services and goods trade sectors. Further, within goods trade, distinction can arise with regard to the effect of exchange rate on manufactured goods from total goods trade as total goods trade is highly sensitive to exchange rate fluctuation on account of petroleum products as a component in it. So one has to separate out this latter component from total goods trade to have clear understanding on the impact of the exchange rate on both kinds of products. The wages and tax rates (besides tariffs) can have important bearings on different kinds of trade flows as these can influence on the competitiveness of exporters. Due to unavailability of data on wage rates for different trade flows, the study could not capture the effect of wages on bilateral trade. However, in line with other studies by considering per capita incomes as a variable instead of gross income, could have partially and implicitly taken into account the effects of wages. The study like earlier studies also failed to capture various non-tariff restrictions in services trade as well as goods trade suggesting methodological improvements on this measure. Studies have been made in direction of exploring the effects of Foreign Direct investment on services trade and goods trade restricting the analysis to OECD countries and their trading partners, however, it was difficult for us to incorporate this information given the coverage of our sample countries which is beyond the OECD countries. We tried to cover more number of poor and least developing countries services bilateral trade data, however, it was very difficult to expand the data set beyond the present sample. Therefore, our country pairs exclude other possible pairs from the analysis. Once a comprehensive data set on these variables are made available, given our results, further, future research could explore on whether our findings are robust to disaggregated data covering more number of middle and poor countries' trade and their intra-trade.

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Data Source and Description

The study considered a total of 48 major exporter and importer countries’ data on their bilateral services exports and imports for the most recent period 2002-01 to 2009-10. It collected the data for those, for which information are more consistently available from various sources except few missing observations for certain countries and certain periods where it was very difficult to collate even from alternative sources. By consistently relying on bilateral services exports and imports data from Euro Stat of the European Commission for a wide range of countries than the literature so far have covered (by using only OECD trade database), the study tried to be broad in its scope, coverage and in drawing its conclusion by using variants of gravity model. In instances, to fill out the missing trade data observations with the Euro stat, it relied on alternative data sources like country sources (central banks and individual government sites) along with the UN statistics on trade in services and OECD data bases.

The sample covered tries to be representative of countries of all per capita income classes which includes 10 major exporters from lower middle income countries (poor emerging), 7 major exporters from upper middle income countries (middle income emerging) and 31 major exporters from the developed countries (rich or advanced). The study besides incorporating the high income countries for which there is greater statistical consistency in data availability, in order to reasonably represent the poor and middle income countries, as best as possible it tried to incorporate more number of poor and middle income countries in the sample for which there exists greater degree of consistency in the available statistics. To maintain consistency in our data, we consistently tried to collect the import data of the reporting countries. When we identify some countries as exporters, it is merely to distinguish them from their counterpart importers as the study considers their exports with each other. Thus, by doing so, the study also covers the trade flows in reverse dimension as these major exporters belonging to 3 groups of per capita income classes are also the major importers from each other's in the sample. The list of considered countries is provided below and their income grouping is followed from the World Bank's income classification of countries (2010).

The study largely considers the intra-trade among the developed countries, and trade between developed and upper middle income countries, and trade between developed and lower middle income countries. The service trade data is largely unavailable for the intra-trade among upper middle countries (except reported for Russian Federation and Romania's trade with other middle income countries) and the intra-trade among the lower middle income countries and also between upper middle and lower middle income countries except Russian Federation's trade with most of the poor countries. Therefore, statistics on such dimension of trade flows are largely absent from the present exercise.³⁸ Any restriction on country sample is purely due to data constraint.³⁹ The major services exporting countries are also the major exporting countries in goods. Corresponding to these services trade statistics of countries, for a reasonable comparison, similar data is also collected on goods trade for same country pairs. The statistics on goods exports is collected from UN trade statistics (UNcomtrade Revision 2). The exports data on services and goods form our two dependent variables.⁴⁰

GDP of all countries including bilateral trade statistics (goods and services exports and imports) are measured in US million dollars and are expressed in real terms by deflating with USA implicit GDP deflator. GDP and population statistics are collected from the World Development Indicators of the World Bank (2010). Bilateral distance measured from great circle distance (and also alternatively distance weighted with respect to size of the population in the principal cities), adjacent (contiguity), landlocked, common language, and area data are taken from CEPII site (see Annexure1). The nominal exchange rate and price ratio variables are compiled from the International Financial Statistics (IFS) of the IMF. The nominal exchange rate is defined as the amounts of exporting countries' currency per unit of importers' currencies. The price ratio is defined as GDP deflator of the importing countries to GDP deflator of the exporting countries.

³⁸ Russian Federation's exports and imports are dropped from the panel of countries as it was found to be an outlier in its trade (exports) and exchange rate relationships.

³⁹ So any empirical analysis of trade between these latter specific country pairs in the study will not be well representative of trade between the same kinds of groups of countries absent in our sample and hence the results derived cannot be generalized. The empirical result relating to such dimensional trade merely reflects the concerned countries' one to one bilateral trade relationship included in the analysis.

⁴⁰ Total service exports comprise of the value of bilateral service transactions in travel, transportation, communication, construction, insurance, finance, royalties and license fees, other business services, personal and cultural, and recreational services and government services for each trading pairs in the sample. This is in line with the accounting convention as followed in the 5th edition of IMF BOP manual (BPM5).

The product of nominal exchange rate and price ratio yields the real exchange rate of countries.⁴¹ A rise in the value of real exchange rate would imply a real depreciation of exporters' currency.

In view of difficulty in obtaining information on number of computers in use, duration of internet access from international sites or for obtaining international information by individual countries which might have contributed to trade linkage with other countries, we only consider number of internet users, secured internet servers, mobile and broad band subscribers which are expressed as per million population along with electricity consumption in kWh per capita from the World Bank. These will reflect the available technological infrastructures of countries for facilitating provision of services across the borders.⁴² Telephone traffics in minutes will reflect the business and cultural contacts or networks across the international borders. However, due to lack of data, we use only telephone lines per million population.⁴³

Stock of number of migrants which is taken to form another network link variable in trade expressed in proportion to the host countries' total population. This data is available for a cross section year 2004 from the Migrating out of Poverty Research Program Consortium (RPC), University of Sussex. Due to estimational difficulties, the study could not measure the amount of information available with the immigrants that helps to establish trade. Rather, its number is directly used as a variable. The years of education in secondary and post-secondary are also collected for the available data points in 2005 and 2010 (=2009) from the World Bank World Development Indicators for capturing the effect of human capital formation on trade. Since these education data are available after each 5 year's gap, therefore, in order to properly assess the impact of human capital formation, we considered last year's data (2010) on years of education as to approximate for 2009 on years of secondary and post-secondary education.

FTA dummy is considered if both the importers and exporters do belong to a membership of any common free trade area. In accordance with whether we are estimating goods exports or services exports' gravity equation, the study incorporates FTAs in either goods or services dummies respectively while FTAs which are common to both goods and services trade appear in both goods and services exports equations.⁴⁴ General Scheme of Preference (GSP) dummy is captured as to reflect the developed economies' preferential treatment to the exporters from the poor developing economies for their better market access. The data on GSP variable is collected from UNCTAD site. Exchange rate regime dummies are considered if one of the two countries is under a fixed or managed exchange rate regime. Also dummies are considered for if both the countries are under fixed or managed or free fall exchange rate regime (pure flexible or market

⁴¹ In the absence of availability of prices data on aggregate domestic services and services exports, the GDP deflators derived from USA dollar value of GDPs of respective countries have been considered as a proxy in order to examine the real impact of exchange rates on service exports. The study also tries to assess the impact of nominal exchange rate on services exports without taking into account of the effect of relative prices. The same real exchange rate definition is also followed for the estimation of goods export equation.

⁴² An increased penetration in the use of internet, mobile, telephone among general population does not warrant increased international trade in goods and services. However, it would reflect the available infrastructure in countries concerned for fostering trade. This implies that while access to high quality electronic infrastructures are essential for promoting trade but not necessarily that high penetration among all general population must significantly influence bilateral trade.

⁴³ Although previous studies have used the data on telephone traffics and number of computers for countries but the same sources have not updated the data for the relevant period of our analysis.

⁴⁴ Due to complexities in policy environment and lack of information on each trade policy, the study does not take into account of varying extent of policy liberalization associated with different trade agreements. If a trading country pair is a member of any regional trade agreements common to both goods and services trade from a certain specific year, the dummy is assigned as one in both the areas of trade for the corresponding years, otherwise the dummy takes the value zero.

exchange rate) or a combination of managed and free fall exchange rate regimes. The classification of countries under different exchange rate regimes is lent from the IMF site.

Rule of law from the World Bank is considered to measure institutional quality as higher rule of law reduces the probability of losing money in contracts of service delivery or investment in services as services trade requires contracts between the buyers and sellers of services. This is also substitutable used with corruption perception index (CPI) of transparency international. To account for the overall national regulatory system of countries, in the context of unavailability of better measures to regulatory barriers covering our sample countries, the study similar to Kimura and Lee (2006) and Walsh (2006), replaces 'rule of law' with respective countries' overall *chain-linked economic freedom of world index* computed by Fraser Institute and also alternatively replaces with the overall *index of economic freedom* compiled by Heritage Foundation in association with Wall Street Journal.⁴⁵ An increase in economic freedom is viewed as a general reduction in regulatory barriers which increases competition. In line with Kandilov and Grennes (2007), time difference between two countries is computed as the average number of hours, from 0-12, that separates their two capitals. Following World Banks' income classification, our sample countries consist of the following:⁴⁶

Poor emerging or Least developed countries (corresponds with Lower Middle Income countries of the World Bank):

China, Egypt, Indonesia, India, Morocco, Nigeria, Philippines, Thailand, Ukraine, Vietnam

Middle Income emerging countries (corresponds with Upper Middle income Countries of the World Bank):

Argentina, Brazil, Malaysia, Mexico, Romania, South Africa, Turkey

Rich or High Income Countries (same as developed countries of the World Bank):

Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Honk Kong, Hungary, Ireland, Israel, Italy, Japan, Rep of Korea, Luxembourg, Netherlands, Norway, Poland, Portugal, Saudi Arabia, Singapore, Spain, Sweden, Switzerland, United Arab Emeritus, United Kingdom, United States of America, Taiwan.

⁴⁵ Rule of law, corruption perception index, Economic freedom index are substituted alternatively so as to avoid any colinearity among them. The economic freedom index of the world of Fraser institute is a composite index of 5 major areas, such as (1) government size, (2) legal structure and security of property rights, (3) access to sound money, (4) freedom to trade internationally, (5) regulation of credit, labor, and business etc. Within 5 major areas, 21 components and their subcomponents are considered in the index. Each component and sub components are scaled from 0 to 10 reflecting the distribution of the data. The component ratings within each area are averaged to derive for each of 5 areas. In contrast, Heritage Economic Freedom Index considers 10 major areas of activity almost overlapping with the 5 areas of activity of Fraser Institutes' Economic Freedom Index and it scales those from 1 to 5. A score 1 signifies a set of policies conducive to economic freedom and a score of 5 signifies a set of policies least conducive to economic freedom. The summary rating is the simple average of these 10 categories. The indices move in opposite direction given their nature of scaling of economic indicators.

⁴⁶ While describing countries by their stages of development is cumbersome, this study in line with the World Bank, classifies the countries broadly on the same benchmark of per capita income levels or follows almost the similar definition. It defines poor emerging economies as those countries where nominal per capita income is between \$996 and \$3,945.⁴⁶ Countries with nominal per capita income above \$12,196 are categorized as rich/developed, while middle income or middle emerging countries are those where per capita income is between these two ranges of income groups or alternatively between \$3946 to \$12,195.

Table 4: Panel OLS regression with Fraser's Economic Freedom Index of World with Income division of trading pairs

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	log of services exports	log of goods exports	log of services exports	log of goods exports	log of services exports	log of goods exports
log of goods exports	0.323*** (23.75)		0.218*** (4.712)		0.316*** (12.15)	
log of services exports		0.224*** (23.83)		0.143*** (4.962)		0.247*** (12.24)
log of income products hh	0.441*** (5.123)	0.214*** (2.990)	0.147 (0.489)	0.144 (0.604)	0.146 (0.770)	0.205 (1.226)
log of income products hm	0.512*** (5.847)	0.288*** (3.952)	0.292 (0.956)	0.157 (0.651)	0.209 (1.087)	0.281* (1.662)
log of income products hl	0.514*** (5.877)	0.366*** (5.026)	0.228 (0.746)	0.279 (1.156)	0.191 (0.998)	0.353** (2.092)
log of income products mh	0.529*** (5.999)	0.287*** (3.902)	0.195 (0.632)	0.238 (0.977)	0.219 (1.131)	0.268 (1.573)
log of income products lh	0.542*** (6.156)	0.303*** (4.130)	0.195 (0.635)	0.212 (0.872)	0.238 (1.232)	0.275 (1.615)
log of capital distance hh	-0.372*** (-9.050)	-0.654*** (-19.74)	-0.241* (-1.869)	-0.601*** (-6.194)	-0.340*** (-4.188)	-0.649*** (-9.396)
log of capital distance hm	-0.972*** (-9.052)	-0.788*** (-8.828)	-1.139*** (-2.685)	-0.928*** (-2.769)	-1.054*** (-5.070)	-0.691*** (-3.771)
log of capital distance hl	-1.130*** (-13.85)	-0.776*** (-11.41)	-1.071*** (-3.187)	-0.488* (-1.829)	-1.310*** (-8.105)	-0.725*** (-5.053)
log of capital distance mh	-1.160*** (-11.01)	-0.906*** (-10.32)	-0.976** (-2.392)	-1.139*** (-3.545)	-1.124*** (-5.289)	-0.802*** (-4.282)
log of capital distance lh	-1.028*** (-11.82)	-0.449*** (-6.170)	-0.907*** (-2.626)	-0.221 (-0.807)	-1.150*** (-7.066)	-0.425*** (-2.944)
log of real exchange rate hh	0.0636*** (3.844)	-0.0174 (-1.264)	0.0723 (1.437)	-0.0400 (-1.006)	0.0946** (2.424)	-0.0148 (-0.429)
log of real exchange rate hm	0.0294 (1.281)	0.000743 (0.0389)	0.0605 (0.813)	-0.00506 (-0.0859)	0.0685 (1.411)	-0.0322 (-0.753)
log of real exchange rate hl	0.0279* (1.721)	-0.049*** (-3.622)	0.0507 (1.276)	-0.0591* (-1.883)	0.0610* (1.871)	-0.0620** (-2.156)
log of real exchange rate mh	0.143*** (6.282)	-0.0477** (-2.504)	0.181** (2.407)	-0.0643 (-1.078)	0.202*** (3.854)	-0.0596 (-1.285)
log of real exchange rate lh	0.126*** (5.356)	-0.053*** (-2.671)	0.147* (1.944)	-0.0496 (-0.828)	0.179*** (3.440)	-0.0354 (-0.771)
common currency	0.238*** (4.449)	0.166*** (3.832)	0.133 (0.847)	0.116 (0.955)	0.256** (2.399)	0.169* (1.828)
colonial link	0.518*** (9.544)	0.207*** (4.585)	0.189 (1.119)	0.127 (0.957)	0.481*** (4.386)	0.276*** (2.859)
Free Trade Areas in Services	0.327*** (6.996)		0.753*** (3.736)		0.385*** (3.716)	
Free Trade Areas in Goods	0.0158 (0.195)	-0.247*** (-3.667)	-0.367 (-1.382)	-0.130 (-0.616)	0.0449 (0.281)	-0.252* (-1.792)
General Scheme of Preferences		0.304*** (8.636)		0.682*** (4.757)		0.357*** (4.449)
Contiguity	0.427*** (4.517)	0.558*** (7.121)	-0.188 (-0.582)	0.305 (1.193)	0.541*** (2.854)	0.612*** (3.668)
Common official language	0.418*** (9.465)	0.205*** (5.566)	0.281** (2.011)	0.317*** (2.888)	0.475*** (5.348)	0.0591 (0.750)
log of absolute time zone differences	-0.105*** (-3.278)	-0.0545** (-2.018)	-0.0130 (-0.128)	-0.0495 (-0.588)	-0.0564 (-0.880)	-0.0487 (-0.839)
log of Fraser's chain sum Economic Freedom Index of World1	0.915**	0.642*	-361.4	-644.6	-0.834	1.419

	(1.996)	(1.682)	(-0.587)	(-1.326)	(-0.419)	(0.810)
log of Fraser's chain sum Economic Freedom Index of World2	0.481	0.122	-132.1	-123.0	-2.205	1.331
	(1.062)	(0.324)	(-0.00013)	(-0.00015)	(-1.143)	(0.783)
log of internet user1	0.133**	0.0463	-37.95	-72.85	0.0734	0.157
	(2.160)	(0.904)	(-0.543)	(-1.320)	(0.344)	(0.837)
log of internet user2	0.159***	0.105**	-9.608	-15.79	0.158	0.177
	(2.627)	(2.097)	(-8.44e-05)	(-0.000173)	(0.794)	(1.010)
log of air passengers arrived1	0.116***	-0.0136	26.03	45.41	0.0320	-0.0412
	(2.829)	(-0.399)	(0.592)	(1.308)	(0.371)	(-0.542)
log of air passengers arrived2	0.0861**	0.000806	8.533	9.444	0.0151	-0.102
	(2.100)	(0.0236)	(0.000118)	(0.000163)	(0.175)	(-1.340)
log of mobile subscriber1	-0.0300	0.144***	26.97	39.06	0.0588	0.433***
	(-0.585)	(3.380)	(0.660)	(1.211)	(0.352)	(2.946)
log of mobile subscriber2	-0.125**	0.0622	15.60	3.435	0.201	-0.124
	(-2.569)	(1.534)	(0.000227)	(6.24e-05)	(1.253)	(-0.873)
log of number of telephone lines1	-0.293***	-0.0647	128.2	231.2	-0.0947	-0.0986
	(-3.765)	(-0.999)	(0.570)	(1.302)	(-0.478)	(-0.565)
log of number of telephone lines2	-0.194**	-0.0737	44.44	43.46	0.0505	-0.403**
	(-2.550)	(-1.161)	(0.000120)	(0.000147)	(0.265)	(-2.403)
log of average tariffs1	0.0812	-0.127***	26.85	35.54	-0.0879	0.108
	(1.384)	(-2.592)	(0.742)	(1.246)	(-0.382)	(0.534)
log of average tariffs2	0.00766	-0.155***	17.36	3.321	0.0618	-0.250
	(0.132)	(-3.199)	(0.000281)	(6.73e-05)	(0.269)	(-1.237)
log of immigrant proportion1			0.181***	0.0523**		
			(5.629)	(2.024)		
log of immigrant proportion2			0.130***	0.0171		
			(4.033)	(0.667)		
log of average years of post secondary education1					-0.847**	0.284
					(-2.012)	(0.764)
log of average years of post secondary education2					-0.467	0.482
					(-1.116)	(1.308)
Constant	-10.72***	-0.305	-305.2	-289.9	-2.365	4.450
	(-3.056)	(-0.104)	(-0.000578)	(-0.000686)	(-0.244)	(0.523)
Observations	7,407	7,407	828	828	1,903	1,903
R-squared	0.872	0.908	0.888	0.924	0.868	0.905

Note: t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1, 1 and 2 indicate importing and exporting countries respectively. All the above models are estimated with country and time specific dummy coefficients, however these coefficients are deleted from the above table for reason of space constraint.

Log of population density, one under managed exchange rate regime, One under fixed exchange rate regime, One under managed and one under free float exchange rate regime, Both under managed exchange rate regime, Both under free float exchange rate regime, log of secure server, log of electricity consumption, log of broadband subscribers and log of average years of secondary education are used as controlled variables for both the importers and exporters in each of the above models but owing to space constraint and finding them mostly insignificant dropped out reporting from the above results.

Table 5: Panel OLS regression with Real Exchange Rate for Indian and Chinese Currency along with Income division of trading pairs

VARIABLES	(1)	(2)	(3)	(4)
	log of services exports	log of goods exports	log of services exports	log of goods exports
log of goods exports	0.324***		0.221***	
	(23.85)		(4.775)	
log of services exports		0.225***		0.145***
		(23.88)		(5.025)
log of income products12 hh	0.411***	0.237***	0.147	0.145

	(4.765)	(3.302)	(0.488)	(0.609)
log of income products12 hm	0.482***	0.312***	0.291	0.157
	(5.492)	(4.261)	(0.956)	(0.654)
log of income products12 hl	0.483***	0.389***	0.226	0.280
	(5.515)	(5.327)	(0.742)	(1.162)
log of income products12 mh	0.498***	0.311***	0.194	0.239
	(5.627)	(4.217)	(0.631)	(0.981)
log of income products12 lh	0.512***	0.326***	0.195	0.213
	(5.806)	(4.429)	(0.635)	(0.877)
log of capital distance hh	-0.375***	-0.653***	-0.240*	-0.601***
	(-9.128)	(-19.74)	(-1.862)	(-6.195)
log of capital distance hm	-0.971***	-0.787***	-1.136***	-0.927***
	(-9.062)	(-8.815)	(-2.683)	(-2.768)
log of capital distance hl	-1.134***	-0.776***	-1.070***	-0.487*
	(-13.92)	(-11.40)	(-3.190)	(-1.828)
log of capital distance mh	-1.166***	-0.904***	-0.973**	-1.141***
	(-11.08)	(-10.31)	(-2.386)	(-3.555)
log of capital distance lh	-1.043***	-0.433***	-0.954***	-0.166
	(-11.93)	(-5.914)	(-2.738)	(-0.600)
log of real exchange rate hh	0.0671***	-0.0184	0.0723	-0.0397
	(4.078)	(-1.338)	(1.439)	(-0.999)
log of real exchange rate hm	0.0297	-0.000107	0.0601	-0.00452
	(1.293)	(-0.00561)	(0.809)	(-0.0768)
log of real exchange rate hl	0.0303*	-0.0486***	0.0506	-0.0588*
	(1.878)	(-3.621)	(1.276)	(-1.877)
log of real exchange rate mh	0.153***	-0.0529***	0.181**	-0.0650
	(6.680)	(-2.776)	(2.417)	(-1.091)
log of real exchange rate lh	0.102***	-0.0577***	0.0973	-0.0366
	(4.064)	(-2.770)	(1.171)	(-0.557)
log of real exchange rate of Indian currency	0.123***	0.0686*	0.0780	0.0282
	(2.582)	(1.726)	(0.667)	(0.304)
log of real exchange rate of Chinese currency	0.106***	-0.0325	0.210*	-0.124
	(2.710)	(-0.998)	(1.813)	(-1.347)
common currency	0.242***	0.160***	0.135	0.113
	(4.534)	(3.697)	(0.860)	(0.934)
colonial link	0.521***	0.207***	0.194	0.127
	(9.616)	(4.587)	(1.149)	(0.956)
Free Trade Areas in Services	0.330***		0.755***	
	(7.113)		(3.748)	
Free Trade Areas in Goods		0.315***		0.682***
		(8.987)		(4.766)
General Scheme of Preferences	0.0232	-0.254***	-0.358	-0.135
	(0.286)	(-3.766)	(-1.352)	(-0.642)
Contiguity	0.418***	0.556***	-0.194	0.310
	(4.425)	(7.087)	(-0.600)	(1.215)
Common official language	0.416***	0.201***	0.279**	0.312***
	(9.430)	(5.459)	(1.997)	(2.836)
log of absolute time zone differences	-0.102***	-0.0512*	-0.0114	-0.0483
	(-3.190)	(-1.895)	(-0.112)	(-0.574)
log of rule of law1	0.545*	0.202	33.35	60.43
	(1.937)	(0.862)	(0.580)	(1.330)
log of rule of law2	1.086***	-0.586**	40.28	61.94
	(3.928)	(-2.545)	(0.719)	(1.398)
log of internet user1	0.165***	0.0657	18.64	28.45
	(2.764)	(1.324)	(0.691)	(1.337)
log of internet user2	0.172***	0.110**	25.16	27.70
	(2.936)	(2.257)	(0.972)	(1.356)
log of air passengers arrived1	0.108***	-0.0186	-1.269	-3.342
	(2.614)	(-0.541)	(-0.482)	(-1.611)
log of air passengers arrived2	0.0644	0.0115	-2.624	-2.310
	(1.562)	(0.336)	(-1.049)	(-1.172)
log of mobile subscriber1	-0.0134	0.155***	-0.487	-10.12*

	(-0.267)	(3.727)	(-0.0718)	(-1.888)
log of mobile subscriber2	-0.129***	0.0561	2.769	-10.81*
	(-2.682)	(1.405)	(0.375)	(-1.856)
log of number of telephone lines1	-0.321***	-0.0777	-35.14	-61.15
	(-4.116)	(-1.196)	(-0.648)	(-1.429)
log of number of telephone lines2	-0.226***	-0.0476	-42.77	-60.60
	(-2.957)	(-0.746)	(-0.812)	(-1.457)
log of average tariffs1	0.0666	-0.125**	2.557	-7.990
	(1.130)	(-2.541)	(0.394)	(-1.560)
log of average tariffs2	-0.0168	-0.141***	6.225	-9.048
	(-0.288)	(-2.903)	(0.864)	(-1.596)
log of immigrant proportion1			0.182***	0.0490*
			(5.659)	(1.891)
log of immigrant proportion2			0.129***	0.0179
			(4.026)	(0.697)
Constant	-5.689	0.0581	429.9	902.7**
	(-1.645)	(0.0202)	(0.753)	(2.006)
Observations	7,407	7,407	828	828
R-squared	0.872	0.908	0.889	0.924

Note: t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1,
1 and 2 indicate importing and exporting countries respectively. All the above models are estimated with country and time specific dummy coefficients, however these coefficients are deleted from the above table for reason of space constraint.

Log of population density, one under managed exchange rate regime, One under fixed exchange rate regime, One under managed and one under free float exchange rate regime, Both under managed exchange rate regime, Both under free float exchange rate regime, log of secure server, log of electricity consumption, and log of broadband subscribers are used as controlled variables for both the importers and exporters in each of the above models but owing to space constraint and finding them mostly insignificant dropped out reporting from the above results.

Table 6: Panel OLS Estimates with Per capita Income (replacing with gross domestic product) irrespective of the Income classes of exporters and importers

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	log of services exports	log of goods exports	log of services exports	log of goods exports	log of services exports	log of goods exports
log of goods exports	0.350***		0.234***		0.339***	
	(25.79)		(5.085)		(12.98)	
log of services exports		0.238***		0.152***		0.253***
		(25.56)		(5.323)		(12.76)
log of per capita income products 12	0.475***	0.275***	0.196	0.147	0.181	0.278*
	(5.430)	(3.792)	(0.648)	(0.617)	(0.943)	(1.665)
log of capital distance	-0.464***	-0.641***	-0.259**	-	-	-0.63***
	(-11.61)	(-19.89)	(-2.054)	0.559***	0.497***	(-9.390)
common currency	0.194***	0.189***	0.115	0.148	0.201*	0.187**
	(3.638)	(4.420)	(0.735)	(1.237)	(1.887)	(2.073)
colonial link	0.559***	0.217***	0.185	0.135	0.535***	0.283***
	(10.19)	(4.774)	(1.090)	(1.011)	(4.810)	(2.933)
Free Trade Areas in Services	0.199***		0.559***		0.159	
	(4.348)		(2.940)		(1.602)	
Free Trade Areas in Goods		0.334***		0.749***		0.396***
		(9.556)		(5.405)		(4.957)
General Scheme of Preferences	0.0421	-0.206***	-0.342	-0.141	0.0950	-0.224
	(0.518)	(-3.073)	(-1.288)	(-0.674)	(0.589)	(-1.593)
Contiguity	0.500***	0.559***	-0.0108	0.428*	0.612***	0.595***
	(5.383)	(7.286)	(-0.0354)	(1.777)	(3.255)	(3.639)
Common official language	0.405***	0.195***	0.265*	0.293***	0.477***	0.0597
	(9.047)	(5.241)	(1.889)	(2.671)	(5.278)	(0.755)

log of low income exporter's exchange rate	0.0957***	-0.0507***	0.108*	-0.0328	0.135***	-0.0476
	(4.426)	(-2.829)	(1.701)	(-0.655)	(3.002)	(-1.215)
log of middle income exporter's exchange rate	0.143***	-0.0666***	0.187***	-0.0685	0.184***	-0.0869**
	(6.644)	(-3.720)	(2.784)	(-1.283)	(3.992)	(-2.156)
log of high income exporter's exchange rate	0.0502***	-0.0443***	0.0566	-0.0678**	0.0737**	-0.0511*
	(3.503)	(-3.734)	(1.520)	(-2.312)	(2.448)	(-1.945)
log of absolute time zone differences	-0.193***	-0.0870***	-0.159*	-0.0796	-0.160**	-0.0745
	(-6.169)	(-3.294)	(-1.655)	(-1.001)	(-2.554)	(-1.317)
log of rule of law 1	0.490*	0.238	12.52*	-11.78**	0.379	0.0804
	(1.718)	(1.009)	(1.663)	(-1.993)	(0.351)	(0.0855)
log of rule of law 2	1.099***	-0.591**	-1.107	-14.44	1.109	0.00272
	(3.916)	(-2.545)	(-0.0914)	(-1.488)	(1.061)	(0.00299)
log of air passengers arrived 1	0.115***	-0.0177	4.61e-05	-0.741***	0.0286	-0.0381
	(2.744)	(-0.511)	(0.000136)	(-2.778)	(0.319)	(-0.489)
log of air passengers arrived 2	0.0658	0.00680	-0.519	0.493	0.00789	-0.111
	(1.568)	(0.196)	(-1.203)	(1.423)	(0.0882)	(-1.420)
log of internet user 1	0.161***	0.0704	4.351	-2.435	0.0484	0.227
	(2.657)	(1.405)	(1.261)	(-0.896)	(0.233)	(1.255)
log of internet user 2	0.158***	0.0945*	1.511	-4.071	0.0515	0.207
	(2.650)	(1.917)	(0.333)	(-1.113)	(0.256)	(1.185)
log of mobile subscriber 1	-0.00759	0.166***	-3.105**	0.244	0.0171	0.471***
	(-0.149)	(3.955)	(-2.145)	(0.214)	(0.101)	(3.192)
log of mobile subscriber 2	-0.104**	0.0766*	3.013	1.018	0.163	-0.0947
	(-2.162)	(1.917)	(0.992)	(0.422)	(1.009)	(-0.673)
log of number of telephone lines 1	-0.329***	-0.0742	-12.37*	3.854	-0.133	-0.141
	(-4.171)	(-1.133)	(-1.795)	(0.711)	(-0.569)	(-0.693)
log of number of telephone lines 2	-0.226***	-0.0293	-0.163	7.765	-0.0481	-0.405**
	(-2.906)	(-0.456)	(-0.0143)	(0.847)	(-0.218)	(-2.112)
log of average tariffs 1	0.0629	-0.135***	-1.157	2.717**	-0.167	0.117
	(1.052)	(-2.722)	(-0.841)	(2.514)	(-0.727)	(0.584)
log of average tariffs 2	-0.0115	-0.136***	5.082*	3.227	-0.0711	-0.188
	(-0.194)	(-2.777)	(1.718)	(1.378)	(-0.315)	(-0.959)
log of immigrant proportion 1			0.185***	0.0609**		
			(5.796)	(2.373)		
log of immigrant proportion 2			0.141***	0.0183		
			(4.408)	(0.716)		
log of average years of post secondary education 1					-0.887**	0.293
					(-2.067)	(0.783)
log of average years of post secondary education 2					-0.555	0.556
					(-1.305)	(1.500)
Constant	-2.670	0.809	82.66	-88.26	-1.198	7.492
	(-0.865)	(0.318)	(0.626)	(-0.834)	(-0.138)	(0.990)
Observations	7,407	7,407	828	828	1,903	1,903
R-squared	0.868	0.906	0.885	0.922	0.863	0.903

Note: t-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1,

1 and 2 indicate importing and exporting countries respectively. All the above models are estimated with country and time specific dummy coefficients, however these coefficients are deleted from the above table for reason of space constraint.

Log of population density, one under managed exchange rate regime, One under fixed exchange rate regime, One under managed and one under free float exchange rate regime, Both under managed exchange rate regime, Both under free float exchange rate regime, log of secure server, log of electricity consumption, log of broadband subscribers and log of average years of secondary education are used as controlled variables for both the importers and exporters in each of the above models but owing to space constraint and finding them mostly insignificant dropped out reporting from the above results.

