

Ariu, Andrea; Nilsson-Hakkala, Katariina

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WHAT EXPLAINS THE SUCCESS OF EMERGING ASIA'S SERVICE EXPORTERS?

Andrea Ariu and Katariina Nilsson Hakkala

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Andrea Ariu (andrea.ariu@unimi.it) is an associate professor at the University of Milan. Katariina Nilsson Hakkala (knilssonhakkala@adb.org) is a senior economist at the Economic Research and Development Impact Department, Asian Development Bank.

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6 ADB Avenue, Mandaluyong City, 1550 Metro Manila, Philippines
Tel +63 2 8632 4444; Fax +63 2 8636 2444
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ABSTRACT

This paper examines the determinants of service exports in emerging Asian economies, with particular emphasis on digital services, which have experienced considerable expansion across the region. Utilizing a structural gravity model, the findings indicate that supply-side factors predominantly drive service exports growth, rather than demand factors or trade policies. An in-depth analysis of these supply-side factors underscores the pivotal role of human capital, specifically education and English proficiency, in bolstering exports, especially within the region's digital business process services sector. Further evidence reveals that stringent regulatory environments and barriers to digital infrastructure considerably impede exports in sectors such as telecommunications, computer and information services, and other business services. Conversely, enhanced internet connectivity not only increases exports of digital services but also boosts the exports of non-digital services.

Keywords: Asia, emerging economies, trade in services, digital services

JEL codes: F10, F14, L80

1. INTRODUCTION

The service sector is the fastest growing economic segment, already generating more than 60% of total value added and 45% of total employment in developing economies and 80% and 74%, respectively, in developed economies (UNCTAD 2024). Services are now gaining importance in international trade in similar ways. Technological development, digitalization in particular, has lowered the trade costs of services and turned an increasing share of previously non-tradable services into tradable ones (e.g., Freund and Weinhold 2004). Since early 2021, exports of business, telecommunication, computer and information services have grown strongly in all main regions of the world. In Asia and Pacific, sales of business, financial, insurance, telecommunication, computer, and IP-related services surpassed 50% of total service exports (UNCTAD 2024).

While several developing economies are diversifying exports further into tertiary sector international markets, a handful are already exploring a services-led growth strategy to achieve economic development (e.g., Baccini et al. 2022; Fan, Peters, and Zilibotti 2021; Ariu 2025). The export of services plays a crucial role in the growth of developing economies by generating employment opportunities, increasing foreign exchange earnings, and mitigating balance of payments deficits. Several factors suggest that boosting exports of services can help achieve economic growth in developing economies. Advancements in digitalization and information and communication technology have enabled services previously considered non-tradable to become tradable and easily exchanged online (e.g., Ariu and Mion 2017; Benz Jaax, and Yotov 2022; Freund and Weinhold 2004; Borchert and Mattoo 2010; Francois and Hoekman 2010). It is also easier to start services production than manufacturing since access to finance is less constraining for production of services, which usually requires smaller investments in physical assets such as production facilities and machinery (e.g., Ariu 2016a; Breinlich and Criscuolo 2011). Economies of scale have lower significance in service production and can be attained without geographic concentration by means of things such as branching, franchising, and digital market access. This development suggests that services rely on physical proximity than previously understood (Nayyar, Hallward-Driemeier, and Davies 2021). While the prospects for services-led growth are promising, there are also threats to the expansion of services trade in developing economies. Specifically, recent developments in artificial intelligence and machine learning have the potential to replace certain aspects of human labor, reducing the appeal of offshoring services to lower-wage developing economies, such as customer support, call centers, accounting, and other business processes.

This paper analyzes the determinants of service exports, focusing on Asian emerging economies,¹ where service export growth far exceeds that of other developing regions and of advanced economies. Providing a detailed picture of the factors driving service export growth is crucial since the participation of developing economies in services trade is still far from inclusive. Some developing economies lead the global surge in service exports: the top-10 service exporting developing economies captured 21% of the global service market in 2023, up 5 percentage points over their market share in 2010 (UNCTAD 2024).² A few exporters have captured most of the additional market, with the People's Republic of China (PRC), India, Singapore and the United Arab Emirates in the lead. Notably, the top service exporters, officially defined as developing by the United Nations, are, in fact, upper-middle-income or high-income economies.³ Economies that trade more in the knowledge-intensive service markets have been more successful in advancing their service exports than the economies relying more on travel service exports. Meanwhile, many developing economies have not seen significant growth in services trade.

Despite the increasing importance of services trade for developing economies, research on the topic is still scant. Previously, lack of interest could be explained by the poor availability of data and the marginal role of developing economies in the global services trade. However, as data availability has improved, the role of services trade for development deserves more attention. Besides previous studies that have highlighted the importance of service imports for economic development—(e.g., Borchert and Mattoo 2010 and Francois and Hoekman 2010), for instance, through increasing productivity in the manufacturing sector due to access to cheaper or higher quality of services inputs (e.g., Arnold, Mattoo, and Narciso 2008; Arnold et al. 2016; Fiorini et al. 2022; Francois 1990)—only a few papers focus on service exports in developing economies. Ariu and Ogliari (2023) examine services trade in Africa and report that exports are primarily focused on low-skilled services, including transport and travel. Their research also indicates potential for growth in service exports. Ariu (2025) analyzes trade in business services, focusing on Ghana, and finds that the main factor underneath the spectacular growth is supply-side determinants

¹ Emerging economies under the IMF definition are indicated at the beginning of section 2. The Asian ones include Bangladesh, the People's Republic of China, India, Indonesia, Malaysia, Pakistan, the Philippines, and Thailand. We extend this group by including frontier and developing Asian economies Cambodia, the Lao People's Democratic Republic, Mongolia, Myanmar, Nepal, Sri Lanka, and Viet Nam.

² The top 10 exporters are the PRC; Singapore; India; United Arab Emirates; Saudi Arabia; Brazil; Hong Kong, China; Mexico; Thailand; and Taipei, China.

³ The United Nations categorizes Singapore and the United Arab Emirates as developing economies.

improving the capacity to export business services. Finally, Dincer and Tekin-Koru (2016) analyze the micro-level dynamics of Turkish service exporters in comparison with goods exporters.

This paper contributes to the literature by analyzing the relative importance of the supply, demand, and trade policy determinants of service exports using a theory-based structural gravity model which controls for multilateral resistance to trade (e.g., Anderson and van Wincoop 2003). Our analysis suggests that the expansion of service exports is primarily attributable to the growing significance of supply-side factors, whereas the influence of demand conditions and trade policies has remained relatively constant over time. This trend is particularly strong for Asian emerging economies, in which supply side factors played a more positive role than for other emerging and advanced economies. This is particularly true for high-tech services such as insurance, financial, and other business services.

Given these findings, we look closer at supply-side factors determining service exports in the second part of our analysis. We are particularly interested in the role of human capital in explaining the growth spurt in service exports taking place in Asian emerging economies. Services are increasingly integral within global value chains. The availability of a relatively skilled yet cost-effective labor force has encouraged foreign investors to shift certain skill-intensive but routine service production stages to economies such as India and the Philippines (Miroudot and Cadestin 2017). While this suggests that lower wage costs and supply of skilled labor have contributed to the surge of service exports of some emerging economies, it also contrasts with the descriptives of the world's top service exporters indicating that higher income is a factor associated with services trade among more advanced economies (OECD 2017).

In addition to general educational attainment, this analysis examines the impact of communication proficiency as another component of human capital that may influence the export of various services. Communication proficiency is considered significantly more critical for trade in services than for trade in goods, given that many services are knowledge-intensive and the use of a common language is often essential for their production and delivery (Hoeckman and Francois 2010). However, the role of communication proficiency for services trade remains rather unexplored. Previous literature on goods trade has suggested common language to be a feature among the most prominent drivers of bilateral trade (e.g., Melitz and Toubal 2014). Eaton and Kortum (2002) have estimated the absence of a common language to add a considerable transaction cost in international exchange. Egger and Lassmann (2012) confirm the positive effect in a meta-analysis in which they find that sharing a common language induces an average positive partial impact (before any general-equilibrium adjustments) on bilateral trade flows, which varies

from 33% to 44%, depending on the control variables in the regression models. In various settings, the trade-enhancing function of a shared native language has often been understood more broadly, serving as an indicator of common cultural heritage or ethnic connections and trust that coexist with common native languages, rather than simply being viewed as a facilitator of communication. However, Melitz and Toubal (2014) find that common *spoken language*, including acquired plus native, is more important than *native* language alone for the ease of communication in explaining the role of common language for bilateral trade. This is also confirmed by Lee (2012) who finds in a cross-section gravity analysis that proficiency in English is more important than proficiency in other languages, such as French and German, for services trade in Organisation for Economic Co-operation and Development (OECD) economies and that communication, financial, commercial, insurance, and business services are the most impacted by the level of English proficiency. Motivated by these previous findings and the fact that English accounts for about 60% of world internet content and is the *lingua franca* of the global economy, pop culture, diplomacy, international organizations, and academia (Salomone 2022), we analyze the impact of proficiency in English, either through acquired skills or as a native language, on services trade.

To assess the influence of diverse supply-side determinants on service exports from Asian emerging economies, we employ an alternative gravity model. In this approach, origin economy-year effects and economy-pair fixed effects are substituted with time-varying economy-specific variables and time-invariant characteristics at the economy-pair level. Recognizing the heterogeneity across service types in skill intensity, digitalization, and tradability, we estimate the effects both on total service exports and by individual service category.

For total service exports, we find that human capital is a key driver for Asian emerging economies, while English proficiency does not appear to confer a significant advantage. Lower income levels, which proxy for wage costs, are negatively associated with total service exports, supporting the view that cost competitiveness is a major factor in driving service exports from the region. These results, however, mask substantial variation across service categories.

When disaggregating the analysis by service category, we observe that the effects of supply-side factors differ significantly. Human capital is positively and significantly associated with exports of both non-digital and digital services, with particularly strong effects in manufacturing services on physical inputs owned by others. English proficiency, in contrast, is positively associated only with digitally traded services—including financial services, charges for the use of intellectual property, telecommunications, computer, and information services; and other business services. It has no significant or even a negative association with non-digital service exports, such

as travel and construction, which instead benefit from sharing a common official language with the destination economy.

The income level of the exporting economy—serving as an indicator of labor cost—correlates negatively with exports in several service categories, especially the digitally enabled. This trend underscores the significance of affordable, English-speaking skilled labor in advancing digital service exports from the region. These findings align with the broader narrative that Asian emerging economies have capitalized on business process offshoring opportunities from high-income economies.

Finally, while foreign direct investment (FDI) is positively associated with exports in selected service sectors, particularly telecommunication, computer and information services, and other business services, we refrain from interpreting this relationship as causal. FDI and service exports benefit from similar comparative advantages, mainly an abundant, low-cost, skilled, English-speaking workforce.

Our paper contributes to the literature by analyzing the role of supply side factors explaining service exports growth in emerging economies, focusing on Asian emerging economies. Previous studies examining services trade have predominantly utilized micro-data, focusing on individual developed economies and typically covering shorter periods (e.g., Ariu 2016b; Breinlich and Criscuolo 2011; Federico and Tosti 2017; Gaulier, Mirza, and Milet 2011; Jensen 2011; Kelle 2013; Walter and Dell'mour 2010). Multiple studies on services trade have employed gravity-type regression methods. For example, Kimura and Lee (2006), Anderson, Milot, and Yotov (2014) and Anderson et al. (2018) show that distance is a stronger constraint for services than for goods, because their flow frequently needs geographical and temporal coordination between customer and supplier for the transaction to take place (e.g., Anderson et al. 2018; Francois and Hoekman 2010).

Research on developing economies remains limited due to a lack of data and the early development of services trade in these economies. However, several developing economies are experiencing rapid growth in this sector. This paper expands on the literature with its focus on Asian emerging economies, particularly by elucidating the unique contribution of English proficiency. The methodology employed by prior research, which utilizes time-invariant variables such as a common native or official language, may effectively capture the influence of static language skills on trade (e.g., Melitz and Toubal 2014, Lee 2012, Salomone 2022). However, it fails to account for the dynamic impact of acquired language skills over time. The increasing use of English as *lingua franca* has contributed to greater language proficiency globally, which has in

turn affected its significance for trade compared to earlier periods. The paper examines the increasing importance of that English proficiency for service exports, employing a time-varying metric.

Section 2's descriptive analysis looks at the growth of service exports in Asian emerging economies, comparing them with other emerging and developed economies. Section 3 analyses the determinants of services trade growth. Section 4 concludes.

2. SERVICES TRADE IN ASIAN EMERGING ECONOMIES

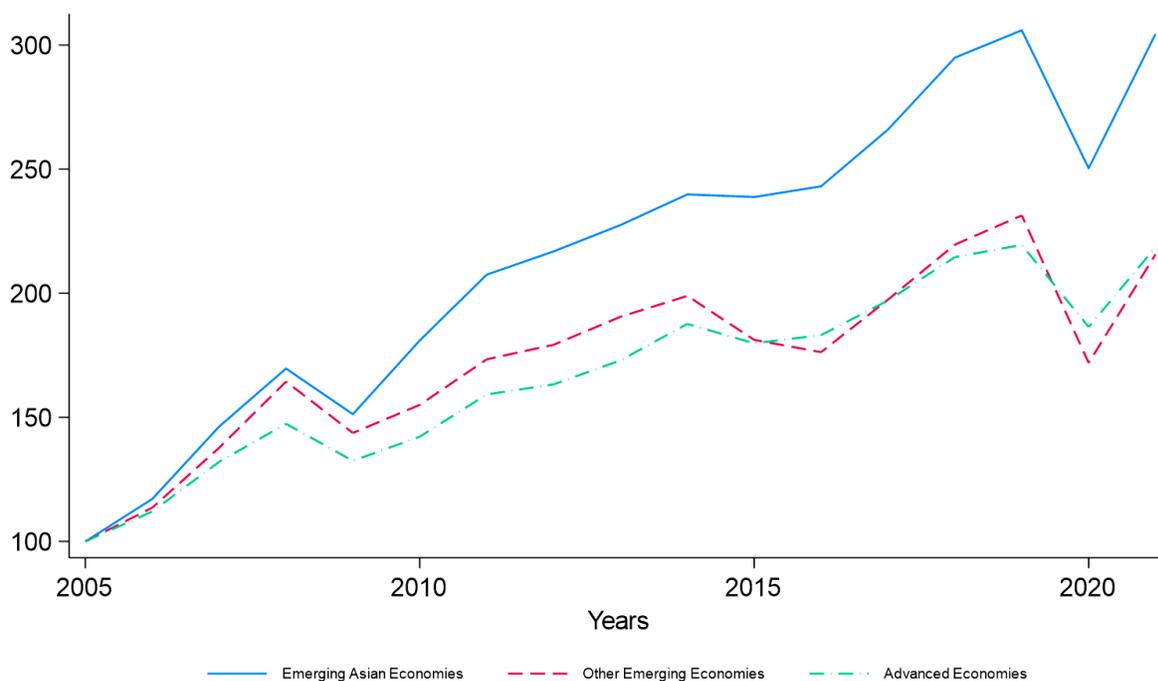
In this overview of trade in services in Asian emerging economies, the data used is from the latest edition of OECD-WTO Balanced Trade in Services (BaTIS) by Fortanier (2018), which includes over 200 reporters and partners and covers the 12 main Extended Balance of Payments Services (EBOPS) 2010 service categories for 2005–2021.

First, we define the economy group of Asian emerging economies. The International Monetary Fund (2015) puts the following economies in its emerging market group in 2015: Argentina, Bangladesh, Brazil, Bulgaria, Chile, the PRC, Colombia, Hungary, India, Indonesia, Malaysia, Mexico, Morocco, Pakistan, Peru, the Philippines, Poland, Romania, Russia, South Africa, Thailand, Türkiye, Ukraine, and Venezuela. We extend this group by including Egypt and Nigeria, which the International Monetary Fund included as emerging economies in 2021, as well as to the frontier and developing Asian economies Cambodia, the Lao People's Democratic Republic, Mongolia, Myanmar, Nepal, Sri Lanka, and Viet Nam. We examine a subset of Asian emerging economies and to provide a comprehensive benchmark, we compare the performance of these Asian emerging economies with other emerging and advanced economies.⁴

Advanced economies still dominate global services trade (Figure A.1), exporting nearly four times more than all emerging economies combined in 2021 (\$4,161.71 billion vs. \$1,008.21 billion). However, Asian emerging economies are growing faster and gaining market share: service exports of Asian emerging economies tripled from 2005 to 2021, while growth was only twofold for the other two groups (Figure 1). This divergence might underscore a structural transformation in the region. The relative outperformance of Asian emerging economies suggests a rapid buildup of capabilities in exporting services that go beyond a worldwide increase in demand for services and explains the our focus on this particular category of economies, which appear to be reshaping their comparative advantage in the global services economy.

⁴ For the list of economies by category see Appendix Table A1.

Figure 1: Services Exports 2005–2021, Asian Emerging, Other Emerging, and Advanced Economies (constant value 2005 = 100)

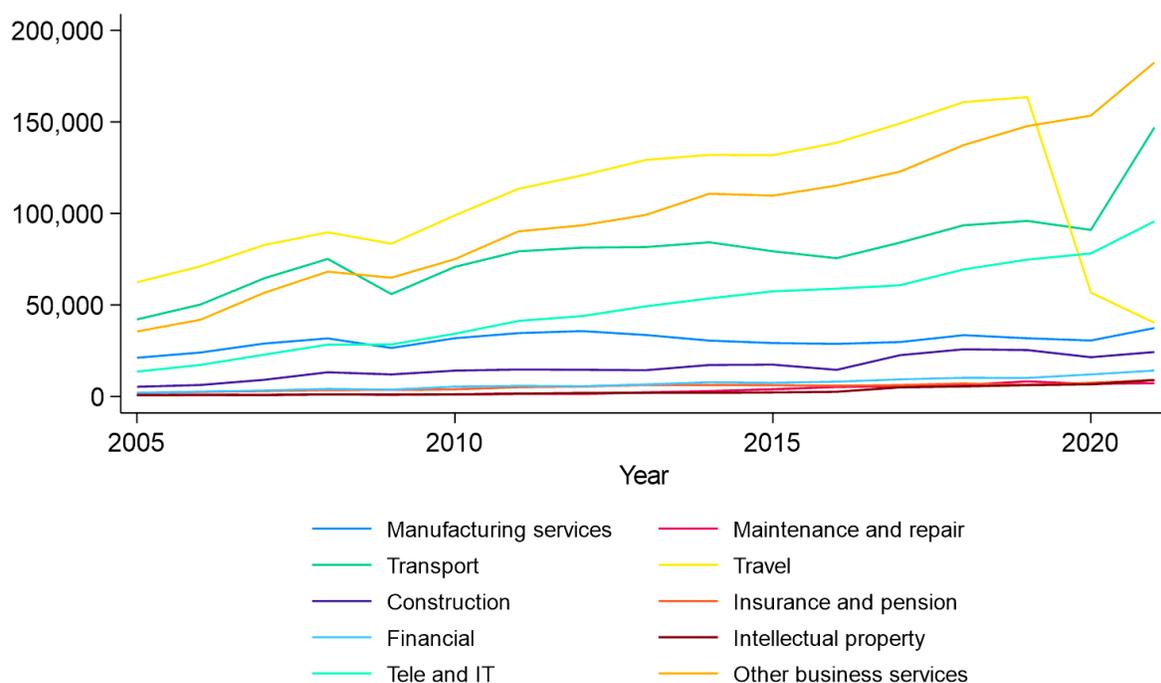


Source: Authors' calculations using data from OECD-WTO Balanced Trade in Services dataset (BaTIS).

Next, we take a closer look at the dynamics of service export growth in emerging Asian economies by breaking it down across 10 service categories in Figure 2. Telecommunication and information technology (IT) services, other business services, and transport together account for almost all of the observed growth in exports. Their combined share of total services exports rose from 49% in 2005 to over 75% in 2021.

Notably, the COVID-19 pandemic had no adverse effects on these sectors; rather, they increased modestly during the final year of observation. Conversely, the pandemic significantly disrupted travel services. Meanwhile, certain services, especially business services like legal, accounting, and call centers are often countercyclical and non-discretionary for firms, remaining essential regardless of the business cycle (Ariu 2016a). The increase in transport services during the first year of the pandemic highlights growing demand and costs associated with goods transportation. This shift occurred as consumer spending transitioned from travel to the purchase of physical products, including medical supplies, computers, and other electronic devices for remote work.

Figure 2: Services Exports 2005–2021, Asian Emerging Economies (\$ million)

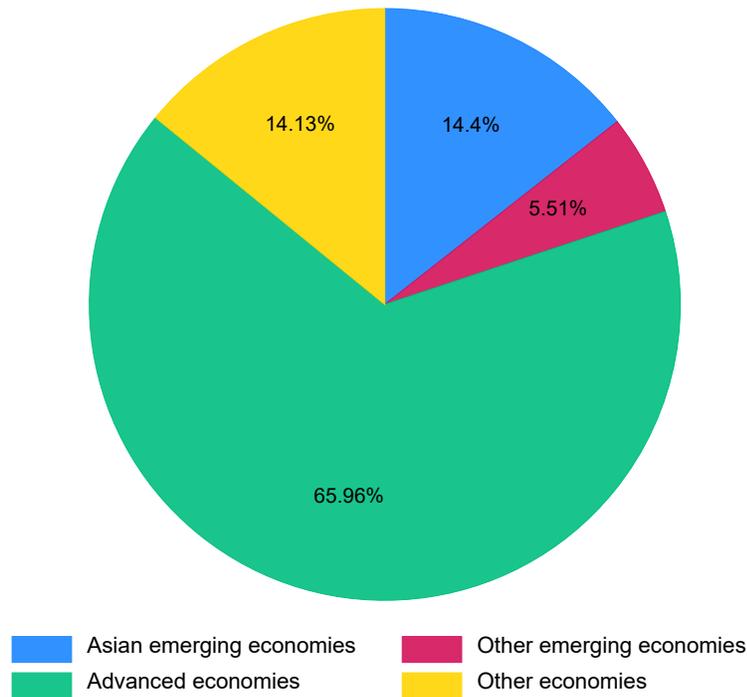


Source: Authors' calculations using data from OECD-WTO Balanced Trade in Services dataset (BaTIS).

A comparison with other economies (Appendix Figures A.2 and A.3) shows a similar pattern: business services lead exports, with significant growth in transport, telecommunication, and IT services. The growth of Asian emerging economies is impressive, meanwhile: their export growth in services outpaced both advanced and emerging economies, boosting their global services exports share from 8% to 11%. Other business services and telecommunication and IT drove the gain, rising 5 and 7 times respectively during 2005–2021 and doubling their global shares to 4% and 2%.

Next, we examine the destinations of service exports by economy group. Figure 3 shows the destination shares of the total service exports originating from Asian emerging economies in 2019, the year before the impact of the pandemic. About 66% of services are exported to advanced economies, 14% to other economies and Asian emerging economies, and 5% to other emerging economies. Compared to other emerging and advanced economies (Appendix Figure A.4), the distribution of export destinations is similar: the majority of exports are sent to advanced economies, while Asian emerging economies, other emerging economies, and other economies account for a smaller share.

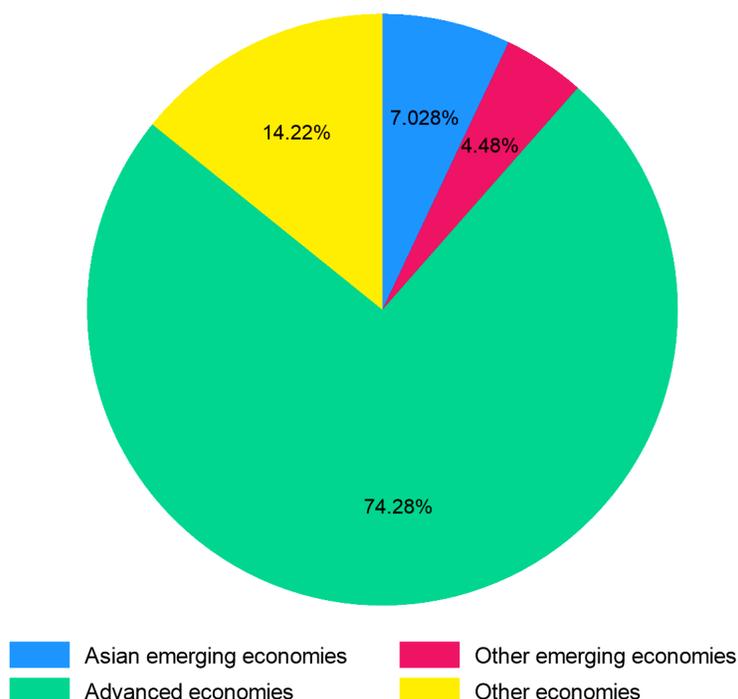
Figure 3: Destination Shares of Total Services Exports of Asian Emerging Economies, 2019



Source: Authors' calculations using data from OECD-WTO Balanced Trade in Services dataset (BaTIS).

As Figure 2 shows, other business services and telecommunication and IT services grew most during 2005–2021. We examine which economy groups in Asian emerging economies exported these services in Figure 4. The results are remarkably like those of Figure 3: other business services and telecommunication and IT services are exported to advanced economies (about 74%), followed by other economies (14%), Asian emerging economies (7%) and other emerging economies (4%). And, in this case, the shares of the four economy groups as destinations are strikingly similar for Asian emerging and other emerging and advanced economies. This suggests that the destination of service exports does not vary much by type of service exported. And importantly, the composition of destinations has not changed over 2025–2021. The respective share of each destination remained quite stable, with a slight decrease of exports towards Asian emerging economies the only exception.

Figure 4: Destination Shares of Telecommunication and IT Services Exports from Asian Emerging Economies, 2019



Source: Authors' calculations using data from OECD-WTO Balanced Trade in Services dataset (BaTIS).

To summarize, Asian emerging economies services exports have grown impressively, particularly exports of other business services and telecommunication and IT services, which has been strong and stable. The pandemic had less impact on these services exports than travel services and other service exports. Since the pandemic, however, other business services have climbed to top position as the most important category of service exports from the region. Finally, advanced economies are the most important destination for Asian emerging economy service exports (but also for advanced and other emerging economies). This has not changed much during 2005–2025.

3. THE DRIVERS OF SERVICE EXPORTS IN EMERGING ECONOMIES

This section analyzes the forces driving service exports growth detailed in the previous section.

3.1. Supply, Demand and Trade Agreement Determinants

Three main forces drive export growth. First, it may result from changes in supply and productivity. For example, in an Eaton and Kortum (2002) model, improved efficiency increases the chances

of being the lowest cost supplier of a certain product and exporting the product. This can be due, for example, to technological or knowledge advances. Second, export growth may result as demand from foreign economies increases as their economies grow. Finally, changes in bilateral trade relations also impact on exports. For example, policy changes such as trade liberalization can foster exports and sanctions hamper them.

We first analyze the relative importance of supply, demand, and bilateral determinants of service trade growth at an aggregated level. We use a structural gravity approach in which we regress service exports of economy i to destination j at time t , Exp_{ijt} , on origin-time, λ_{it} , destination time, δ_{jt} , and origin-destination fixed effects, γ_{ij} , using pseudo poisson maximum likelihood (PPML) method. The structural gravity equation that we estimate is given by:

$$Exp_{ijt} = \beta_0 + \alpha_1 RTA_{ijt}^{Gonly} + \alpha_3 RTA_{ijt}^{G\&S} + \lambda_{it} + \delta_{jt} + \gamma_{ij} + \epsilon_{ijt} \quad (1)$$

The first fixed effect reflects demand's impact on service growth, the second shows supply's role, and the bilateral effect encompasses all time-invariant bilateral factors. To control for bilateral factors that are time variant, we use dummies that capture the existence of regional trade agreements (RTAs) distinguishing agreements covering for goods trade only RTA_{ijt}^{Gonly} , or both in goods and services, $RTA_{ijt}^{G\&S}$ using data from Egger and Larch (2008). During the analysis period from 2005 to 2021, service trade agreements were implemented concurrently with goods trade agreements, which limits the ability to isolate the impact of services agreements independently. Thus, we construct a dummy variable for trade agreements for goods trade only and another dummy variable for trade agreements including both goods and services trade for any economy-pair and year. According to Ariu and Ogliari (2023), services trade restrictions are applied on a non-discriminatory basis, meaning they do not differ across partner economies and are accounted for by economy-year fixed effects.

Table 1: Trade in Services Determinants

	(1)	(2)	(3)	(4)
	All	Asian emerging economies	Other emerging economies	Advanced economies
	Exp_{ijt}	Exp_{ijt}	Exp_{ijt}	Exp_{ijt}
RTA_{ijt}^{Gonly}	0.012 (0.035)	0.053 (0.042)	0.097** (0.047)	-0.028 (0.046)
$RTA_{ijt}^{G\&S}$	0.016 (0.021)	-0.037 (0.034)	0.047 (0.044)	0.011 (0.024)
Constant	8.389*** (0.011)	7.804*** (0.013)	6.721*** (0.023)	8.637*** (0.014)
Observations	204,333	41,468	53,316	106,587

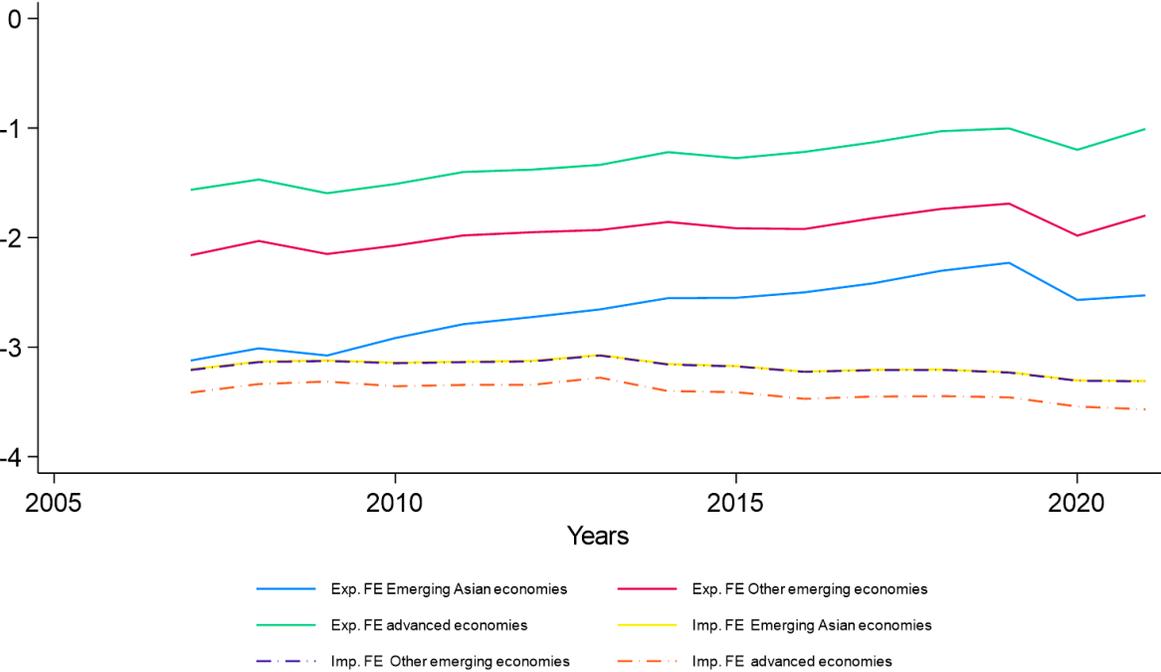
Notes: The dependent variable is the total export of services from economy i to j in year t , Exp_{ijt} . Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
Source: Authors' calculations.

Table 1 displays the results of the PPML estimations for equation (1). During the period of analysis, the RTAs seem not to have affected trade in services growth when looking at the total sample in column 1. Instead, when distinguishing between Asian emerging economies in column 2, other emerging economies in column 3, and advanced economies in column 4, we can appreciate that RTAs covering goods trade had positive spillover effects also for trade in services for the other emerging economies category. This result is reminiscent of the complementarity between goods and services trade, i.e., liberalizing trade in goods also facilitates the export of services (e.g., Ariu Mayneris and Parenti, 2020). However, we do not capture this positive effect for the RTAs that cover both goods and services trade. It is possible that these RTAs are too scarce in our period of analysis or too shallow to show any significant impact. It is also possible that the estimates of the RTAs are subject to downward bias. Nagengast and Yotov (2025) contend that recent evaluations regarding the effects of RTAs yield estimates considered to be implausibly low. They use an extended two-way fixed effect estimator for staggered difference-in-differences within the structural gravity model and find that conventional estimators are biased downward since they put larger weights on short-run effects and on those of late cohorts, which are both associated with smaller treatment effects. Keeping this in mind, we will return to the effect of RTAs in the second part of our analysis.

To disentangle the effect of supply and demand determinants, we plot the average of the origin-time and destination-time fixed effects during the period of analysis, distinguishing between Asian emerging economies, other emerging economies, and advanced economies (Figure 5). Results indicate that demand remained stable over time for all economy categories. Moreover, its magnitude is remarkably similar for all economies, captured by the parallel lines in the figure.

Instead, supply determinants are shown to be increasing over the period for both emerging and advanced economies. The rise in exports of services for both groups of economies is mainly due to enhanced capacity in service production within their economies, rather than a higher demand for these services. Therefore, the rapid growth observed in emerging economies, as highlighted in the previous section, is largely a result of their improved capabilities to supply services internationally.

Figure 5: Supply and Demand Determinants



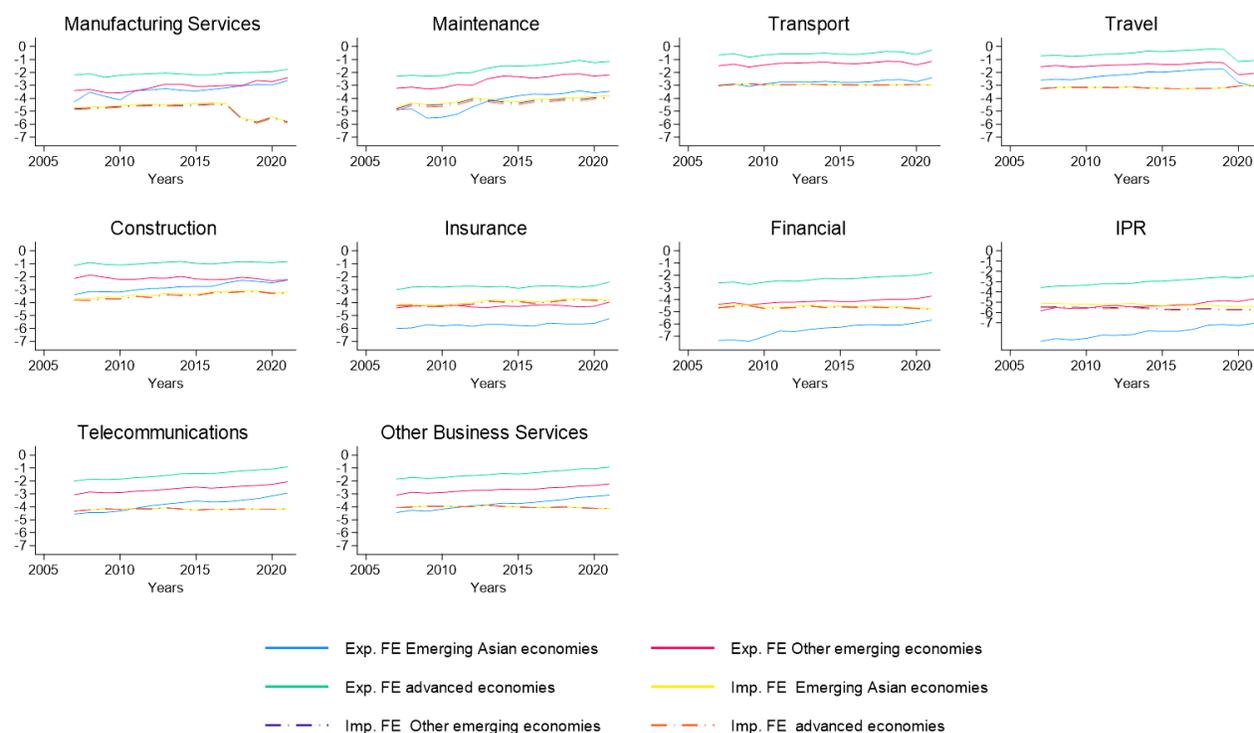
Exp. FE= Average exporter/origin-economy fixed effects, Imp. FE=Average importer/destination-economy fixed effects.

Source: Authors' calculations.

By distinguishing between different types of services in Figure 6, it is possible to observe a significant degree of heterogeneity. First, the role of demand is not constant for all services. It played a positive role for manufacturing (up to 2016), and maintenance, and a negative role for Intellectual Property Rights (IPR) and financial services. Second, the expansion of trade across most service categories is primarily attributed to supply-side factors. Third, the role of supply side factors has been slightly more positive for Asian emerging economies and advanced economies than for other emerging economies. This is particularly true for high-tech services such as insurance, financial, and other business services.

These findings suggest that although demand influences service exports growth, supply-side factors are the primary driver. In the next subsection, we scrutinize these determinants.

Figure 6: Supply and Demand Determinants by Service Category



Exp. FE= Average origin-economy fixed effects, Imp FE=Average destination-economy fixed effects. IPR=Intellectual property rights.

Source: Authors' calculations.

3.2. Disaggregated Supply-Side Determinants

The previous section suggests that supply-side factors, not demand, have mainly driven service export growth in emerging economies. As section 2 shows, several economies have recorded significant increases in business service exports. This prompts us to further examine which supply-side factors might account for the rise in exports of these highly skill-intensive services. To do so, we employ an alternative gravity model in which origin-year fixed effects are substituted with time-varying, economy-specific variables. In addition, to evaluate how certain supply-side factors interact with bilateral ones, such as the role of English proficiency with respect to sharing a common language, we also replace the origin-destination pair fixed effects by time invariant economy pair covariates. In the robustness checks, we show that our results remain consistent when putting back the bilateral fixed effects. Destination-year fixed effects are used to account

for demand-side factors in every instance. We discuss below the time varying economy-specific factors and time invariant economy pair factors included in the analysis.

Human capital

We are particularly interested in the role of human capital in explaining the growth spurt in emerging economy service exports. We use three key measures of human capital important in services: a human capital index based on average years of schooling and an assumed rate of return to education, English language proficiency, and educational attainment. As the main proxy of general human capital, we use a human capital index from Penn World Tables, due to its larger economy coverage for the period of study.⁵ We check the robustness of our findings by using the share of population (25 years or older) with at least a bachelor's degree, from the World Development Indicators. Given that services are highly knowledge intensive and often depend on significant information and knowledge exchange for delivery (e.g., Francois and Hoeckman 2010), strong English language proficiency provides a substantial advantage in the export of services. We take this information from the EF English Proficiency Index, the world's largest ranking of economies by English skill.⁶ In the annual EF EPI survey data, more than 2 million test takers have taken the EF Standard English Test or one of our English placement tests around the world. Economies were included in the index if they had at least 400 test takers; in many instances, the number of test takers exceeded this minimum requirement. While the sample of EF English Proficiency Index test takers tends to include individuals with an interest in language study and younger adults, it maintains a balanced distribution between male and female participants and encompasses adult language learners representing a wide range of ages. The index scores demonstrate a strong correlation with both TOEFL iBT and IELTS Academic Test results,⁷ indicating that despite differences in the structure and intended audiences of these assessments, they consistently reflect comparable patterns in national English proficiency levels. Economy scores are sourced from the annual EF English Proficiency Index reports, which provide both scores and rankings. We use the score and normalize the economy score by dividing it with the

⁵ Following a common approach in the literature (e.g., Caselli 2005), Penn World Tables compute a human capital index based on average years of schooling and an assumed rate of return to education, based on Mincer equation estimates for around the world (Psacharopoulos 1994; for more details, see the Groningen Growth and Development Centre at <https://www.rug.nl/ggdc/productivity/pwt/pwt-documentation>).

⁶ The EF Standard English Test is free and online, so anyone with internet can participate: See www.ef.com/wwen/epi/.

⁷ The TOEFL refers to the Test of English as a Foreign Language and the IELTS is the International English Language Testing System.

annual maximum score value to obtain an index taking the maximum value of one.⁸ In the two first editions of the index for 2011 and 2012, the score was computed by combining data from 3 years.⁹ We compute annual values by using the score values from 2007–2009 for scores in 2007 and 2008 and from 2009–2011 for scores in 2010 and 2011 and compute the average score values from 2007–2009 and from 2009–2011 for 2009. From 2012, the EP English Proficiency Index editions report annual values for the previous year. Tradable services tend to be highly skill intensive and only economies with good educational attainment can produce services for export (e.g., per Francois and Hoeckman 2010).

Trade policy

As a source for trade policy variables, we gain information from Egger and Larch (2008), who record whether there is an active trade agreement in either goods, services, or both for 1950–2021 and any economy pair. More specifically, they account for customs unions, free trade agreements, and partial scope agreements, which are related to goods liberalization only; economic integration agreements, which are related to services only; or the presence of both good and service-related agreements. As noted, a characteristic of the analytical period is that service trade agreements are consistently implemented alongside goods trade agreements, rendering it unfeasible to isolate the independent impact of services agreements. Thus, like before, we use a dummy variable for trade agreements for goods trade only and another dummy variable for trade agreement including both goods and services trade for any economy-pair and year.

Beyond border policy barriers

Policy barriers in services remain significant and have been identified as factors that limit the exchange of services (Nordås 2016). We use two indices from the OECD to assess the impact of barriers other than trade barriers on services trade. The OECD Services Trade Restrictiveness Index (STRI) captures a diverse and complex global regulatory environment affecting trade in services in general and the OECD Digital Services Trade Restrictiveness Index (Digital STRI) captures the regulatory environment affecting trade in digitally enabled services. The STRI

⁸ The score scale changes after 2018, but the normalization provides a consistent index over time. Economies with English as a primary language but included in the EFI English Proficiency Index sample of economies are given the maximum value of one.

⁹ In the edition of EF English Proficiency Index from 2011, the score was calculated using combined test taker data from 2007–2009, and in the second edition from 2012 the score was calculated using combined test taker data from 2009–2011.

consists of different components and is computed for different economic activities. However, we could match only 6 of the 10 EBOPS service categories with the economic activities in the overall STRI, and therefore we choose to use the index for total services trade for all the 10 EBOPS categories. We will not include STRI indexes in our main estimations because they exist only from 2014 onwards, excluding some of the Asian emerging economies in our estimation sample. The overall STRI index for total services has a smaller economy coverage than the Digital STRI.¹⁰

Digital infrastructure

A growing number of services are now exchanged via digital platforms, making adequate information and communications infrastructure an essential prerequisite for service exports (e.g., Ariu and Mion 2017; Benz, Jaax, and Yotov 2022; Freund and Weinhold 2004; Borchert and Mattoo 2010; Francois and Hoekman 2010). While data on information and communications infrastructure is limited for the full period, available measures cover many economies. We consider two measures, secure internet servers (per 1 million people) and mobile cellular subscriptions (per 1 hundred people) from the World Development Indicators.

FDI and foreign firms

FDI inflows can be conducive of trade in services. Multinationals have production networks that can allow them to exchange services more rapidly and effectively. To analyze the direct impact of FDI in services production, we use data on investments from fDi Markets, the most comprehensive worldwide database for greenfield and mergers and acquisitions FDI. The data includes information on FDI projects by economy and industry (North American Industry Classification System (NAICS) 3 classification) and thus allows us to compute annual sums of FDI flows by different service industries. However, FDI flows cannot be matched to all 10 EPOBS categories because in some sectors, such as transport, construction, and real estate, distinguishing between investments in services and physical assets is not possible. We compute FDI investments for the four EBOPS categories of digital services including: insurance and pension services, financial services, telecommunications, computer, and information services, and other business services.¹¹

¹⁰ The overall STRI is missing for Bangladesh, Cambodia, the Lao People's Democratic Republic, Mongolia, Myanmar, Nepal, Pakistan, and Sri Lanka, while the digital STRI is missing for Bangladesh, Mongolia, Myanmar, and Sri Lanka.

¹¹ See for mapping of NAICS classification to EBOPS classification categories in Appendix Table A2.

Economy size and income level

The size of an economy's gross domestic product (GDP) might represent great value added to exploit scale economies and hold a set of big firms able to export services. A growing economy indicates that productive firms are successfully reaching international markets, adding economic value. Income level, measured as GDP per capita, serves as a proxy of the average level of wage costs. As a source for these economy-specific factors, we use data for gravity variables from the CEPII Gravity Database (Conte et al. 2022).

Other bilateral factors

In addition to the variables proxying the effect of the supply-side factors of interest, we also include additional gravity variables. These include time invariant economy pair variables distinguishing the bilateral trade costs by geography (distance and common border), culture (common official language), and history (as part of the same colony and common legislation) the CEPII Gravity Database (Conte et al. 2022). Specifically, we want to know if English proficiency has an impact beyond simply sharing a language. We exclude common official language in our main specifications, since this common language variable is perfectly collinear with the variable English proficiency for the economy pairs which have English as an official language. We report estimations with common official language as additional control variable as a robustness check in the appendix. Most gravity estimates cover 2007–2019, though some robustness checks and extra analyses use shorter periods or fewer economies due to limited data.

4. ESTIMATION RESULTS

Table 2 reports the results of the gravity estimation for the total service exports in Asian emerging economies in columns 1 to 2 and other emerging economies in columns 3 to 4. Columns 1 and 3 report results for specifications using the sum of total services in all 12 EBOPS categories and columns 2 and 4 report the results for specifications including exports by category in 10 EBOPS categories (excluding personal, cultural, and recreational services and government goods and services) including service category-year fixed effects. The estimates for total exports and exports divided among 10 service categories are similar overall, though significant differences exist between Asian and other emerging economies. For the Asian emerging economies, the estimates for English proficiency are not statistically significant but the estimates of human capital are positive and statistically significant. For other emerging economies, English proficiency is positive and statistically significant, but the estimates of human capital are negative.

Table 2: Gravity Estimation by Total Services for Asian and Other Emerging Economies

	(1)	(2)	(3)	(4)
	Asian Emerging		Other Emerging	
	Total Export _{ij}	Export _{kij}	Total Export _{ij}	Export _{kij}
Log Distance _{ij}	-0.692*** (0.051)	-0.691*** (0.051)	-0.916*** (0.042)	-0.926*** (0.043)
RTA_{ijt}^{Gonly}	0.232** (0.107)	0.240** (0.108)	0.187** (0.083)	0.187** (0.084)
$RTA_{ijt}^{G\&S}$	0.646*** (0.125)	0.653*** (0.126)	0.308*** (0.071)	0.325*** (0.073)
Common Colony _{ij}	0.647*** (0.202)	0.652*** (0.208)	0.091 (0.204)	0.058 (0.206)
Contiguity _{ij}	-0.058 (0.168)	-0.064 (0.170)	0.315*** (0.121)	0.325*** (0.125)
Common Legal _{ij}	0.476*** (0.108)	0.483*** (0.112)	0.221*** (0.069)	0.219*** (0.070)
Log GDP _{ij}	0.747*** (0.031)	0.756*** (0.032)	0.673*** (0.040)	0.679*** (0.041)
Log GDP per Capita _{it}	-0.342*** (0.115)	-0.361*** (0.118)	-0.067 (0.072)	-0.068 (0.073)
English Proficiency _{it}	0.621 (0.487)	0.651 (0.500)	0.953*** (0.294)	0.964*** (0.301)
Human Capital _{it}	0.892*** (0.181)	0.952*** (0.185)	-0.323*** (0.098)	-0.336*** (0.101)
Fixed Effects	Year, Importer-year	Service #Year, Importer-year	Year, Importer-year	Service #Year, Importer-year
Observations	23,246	232,460	36,940	369,400
Pseudo R ²	0.946	0.838	0.919	0.831

Note: PPML estimations with either year or year-service category fixed effects and robust standard errors clustered by economy pairs in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

According to the estimates in Table 2, regional trade agreements enhance service exports for all emerging economies. This effect is more pronounced for Asian emerging economies, both in agreements focused solely on goods trade and those that include provisions for services trade. For the agreements which include services trade provisions, the estimated coefficients for other emerging economies are less than half the size of the coefficients for Asian emerging economies. Table 2 shows a positive effect, which contrasts with our structural gravity model estimates from the previous section. Although structural gravity model is more theory consistent than the gravity

model that replaces exporter-time and economy pair fixed effects with traditional gravity variables, Nagengast and Yotov (2025) also argue that recent analyses of the impact of RTAs using a conventional structural gravity model obtain estimates that are perceived as unrealistically small.

The income level of the exporting Asian emerging economies is negatively related to service exports. To the extent that the GDP per capita variable proxies wage cost level, these results suggest that one of the factors driving service exports from these economies is lower wage costs. The other gravity variables have expected signs—distance between the source and destination economies is negatively related to service exports—but they have a larger impact on exports of other emerging economies than on those of Asian emerging economies. A common border is positive but not statistically significant in all specifications. Larger economies tend to have higher export volumes, as indicated by the positive and statistically significant coefficients associated with GDP. Historical ties captured by shared colonial and common legal origin are positively related to service exports of Asian emerging economies but not of other emerging economies.

To assess the influence of bilateral time-invariant unobserved factors on the results, we reintroduce bilateral fixed effects into the estimations as a robustness check. Results in Table A.3 show that our results remain broadly similar. Thus, the results for total service exports suggest that human capital is an important driver of those from Asian emerging economies, while the results for English proficiency seem to depend on the specification and the geographical distinction. However, total service exports include various categories of services determined by quite different factors, suggesting that the estimates for the total services mask heterogeneity. As shown by the descriptives, growth in total service exports is driven by certain service categories, which motivates us to estimate the gravity equations by service category.¹²

Next, we focus on the supply-side factors that explain export of services from Asian emerging economies, distinguishing the effects by type of service. Table 3a reports the results for non-digital service categories and Table 3b for service categories that can be traded digitally for Asian emerging economies. There are notable differences in estimations for these two main categories. While estimates for English proficiency are positive and statistically significant for exports of all digitally traded services in Table 3b, they are negative or insignificant for all the non-digitally traded categories of services in Table 3a, except maintenance and repair services. The distinction

¹² Appendix Table A.4 reports the results for the same estimations for advanced economies by service category. Notably, estimates for English proficiency are not significant and estimates for human capital are negative. These could reflect that both the level of human capital and English proficiency are generally high in all advanced economies, and, on the margin, a higher level does give an extra boost to service exports.

is less pronounced for human capital, which exhibits a positive association with exports across multiple categories of both non-digital and digital services. Notably, the coefficient is especially high for manufacturing services on physical inputs owned by others. The income level of the source economy is negatively related to service exports of manufacturing services, financial services, charges for IPR, telecommunications, computer, and information services, and other business services. These findings support the hypothesis that the endowment of low-cost English-speaking skilled labor is a supply side factor driving digitally traded business service exports from Asian emerging economies to advanced high-income economies.

Table 3a: Gravity Estimation by Service Category, Asian Emerging Economies, Non-Digital Service

	(1)	(2)	(3)	(4)	(5)
	Manufacturing services on physical inputs owned by others	Maintenance and repair services	Transport	Travel	Construction
	$Export_{kij}$	$Export_{kij}$	$Export_{kij}$	$Export_{kij}$	$Export_{kij}$
$Log Distance_{ij}$	-0.979*** (0.113)	-0.515*** (0.093)	-0.478*** (0.079)	-0.766*** (0.070)	-0.120 (0.123)
RTA_{ijt}^{Gonly}	-0.115 (0.303)	-0.076 (0.172)	0.381*** (0.096)	0.498*** (0.100)	0.049 (0.110)
$RTA_{ijt}^{G\&S}$	0.561*** (0.205)	-0.068 (0.127)	0.599*** (0.153)	0.797*** (0.116)	1.474*** (0.355)
$Common Colony_{ij}$	1.211** (0.504)	-0.419 (0.560)	0.743*** (0.126)	0.801*** (0.284)	0.447* (0.243)
$Contiguity_{ij}$	0.841*** (0.252)	0.614*** (0.162)	0.396** (0.183)	0.051 (0.163)	0.254 (0.172)
$Common Legal_{ij}$	0.287 (0.336)	0.101 (0.192)	0.222*** (0.080)	0.213** (0.093)	0.167* (0.093)
$Log GDP_{jt}$	0.960*** (0.070)	0.759*** (0.048)	0.808*** (0.028)	0.461*** (0.029)	0.733*** (0.044)
$Log GDP per Capita_{jt}$	-0.720*** (0.207)	0.693*** (0.165)	0.002 (0.097)	0.201** (0.100)	0.287* (0.149)
$English Proficiency_{it}$	2.088 (1.270)	3.207*** (0.972)	-0.013 (0.533)	-3.567*** (0.558)	-0.298 (1.042)
$Human Capital_{it}$	4.529*** (0.607)	0.299 (0.379)	0.888*** (0.194)	0.727*** (0.156)	0.593* (0.310)
<i>Observations</i>	23,175	22,776	23,246	23,246	23,246
<i>Pseudo R²</i>	0.941	0.905	0.936	0.897	0.899

Note: PPML estimations with year and importer-year fixed effects and robust standard errors clustered by economy pairs in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

Table 3a presents results for non-digital services categories, while Table 3b shows findings for services categories that can be traded digitally in Asian emerging economies. The estimations for these two main categories demonstrate differences.

Table 3b: Gravity Estimation by Service Category for Asian Emerging Economies, Digital Services

	(1)	(2)	(3)	(4)	(5)
	Insurance and pension services	Financial services	Charges for the use of intellectual property n.i.e.	Telecommunication, computer, and information services	Other business services
	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}
Log Distance _{ij}	-0.572*** (0.092)	-0.237** (0.114)	-0.254** (0.108)	-0.705*** (0.102)	-0.453*** (0.069)
RTA_{ijt}^{Gonly}	0.186 (0.128)	0.253 (0.212)	-0.354* (0.199)	0.275* (0.166)	0.248* (0.143)
$RTA_{ijt}^{G\&S}$	0.626*** (0.188)	0.505*** (0.158)	0.349* (0.202)	-0.077 (0.128)	0.298** (0.145)
Common Colony _{ij}	0.004 (0.220)	0.141 (0.195)	0.645** (0.271)	0.173 (0.168)	0.691*** (0.176)
Contiguity _{ij}	-0.326 (0.255)	0.009 (0.220)	-0.426 (0.294)	-0.200 (0.277)	-0.003 (0.175)
Common Legal _{ij}	0.487*** (0.114)	0.633*** (0.123)	0.754*** (0.208)	0.617*** (0.111)	0.488*** (0.100)
Log GDP _{jt}	0.701*** (0.048)	0.909*** (0.050)	1.156*** (0.085)	1.264*** (0.058)	0.996*** (0.038)
Log GDP per Capita _{jt}	0.487*** (0.143)	-0.681*** (0.154)	-0.861** (0.358)	-1.868*** (0.206)	-0.868*** (0.142)
English Proficiency _{it}	3.371*** (1.003)	3.329*** (1.275)	5.870*** (1.375)	10.428*** (0.917)	4.101*** (0.609)
Human Capital _{it}	-0.881*** (0.244)	0.759** (0.353)	1.375** (0.606)	1.533*** (0.390)	1.358*** (0.272)
Observations	23,246	23,246	22,982	23,246	23,246
Pseudo R ²	0.833	0.876	0.885	0.955	0.951

Note: PPML estimations with year and importer-year fixed effects and robust standard errors clustered by economy pairs in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

The other gravity variables have expected signs—distance between the source and destination economies is negatively related to service exports—but the size of the coefficient varies by service category, having the largest impact on manufacturing, travel, telecommunication, computer, and information services, and construction services and the smallest for charges for the use of intellectual property not included elsewhere (n.i.e.) The first category of services typically requires closeness to the production site. The common border is positive and statistically significant only for maintenance and repair services. These services are typically not traded digitally. Larger economies tend to export more, as indicated by the positive and statistically significant estimates of GDP. Regional trade agreements that include both services and goods trade provisions boost several service categories more than those including only goods provisions, except for telecommunication, computer, and information services, for which only the regional trade agreements including only goods have a positive impact. While there is no evident correlation between being part of the same colony and the export of services across distinct categories, having common legislation appears to facilitate several types of service exports.¹³

4.1. Additional Estimations and Robustness Checks

Several restrictions beyond borders might limit service trade. These types of restrictions are particularly relevant for trade in services that are not subject to tariffs and other trade restrictions at the border. Many of these barriers restrict not just services trade but also FDI in services, which is vital for boosting exports in emerging economies.

We use two OECD indexes to assess the impact of the regulatory environment on services trade, as noted. The STRI captures a diverse and complex global regulatory environment affecting trade in services in general and the OECD Digital STRI captures the regulatory environment affecting trade in digitally enabled services. We first estimate the effect of the overall STRI index and the digital STRI for all 10 EBOPS categories. We report only the estimates for the RTA and STRI variables in Table 4. Because of limited time and economy coverage, estimates for other variables cannot be compared with those in Table 2. These results suggest that both the overall STRI and Digital STRI of the economy of origin are significant and negatively related to service exports. However, the effect and the statistical significance of the overall STRI is larger. These regulations

¹³ Table A.5 reports the estimation results by service type for other emerging economies, The results for English proficiency and human capital are similar but the coefficients are smaller and for some service types, e.g. charges for the use of intellectual property n.i.e, they are not statistically significant. The main difference is the opposite (negative) effect of human capital on travel services and construction services.

could, for instance, discourage both domestic and foreign investors from investing in services production.

Table 4: Gravity Estimation with Overall STRI and Digital STRI by for Asian Emerging Economies for Total Services Exports

	(1)	(2)
	Overall STRI	Digital STRI
	Export _{kij}	Export _{kij}
STRI _{ijt} (origin)	-3.021*** (0.539)	-0.806* (0.413)
<i>RTA_{ijt}^{Gonly}</i>	-0.089 (0.115)	0.065 (0.117)
<i>RTA_{ijt}^{G&S}</i>	0.430*** (0.155)	0.554*** (0.170)
Observations	78,280	107,680
Pseudo R ²	0.835	0.838

RTA = regional trade agreement, STRI = OECD Services Trade Restrictiveness Index.

Note: PPML estimations. All the estimations include year, year-service category, importer-year fixed effects, log distance, origin economy log GDP, origin economy GDP per capita, dummy variables for common border, trade agreements, having being part of the same colony, and common legislation. Robust standard errors clustered by economy pairs in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

To delve deeper into the role of the regulatory environment for digital service exports, we further analyze the effect of Digital STRI on the five digital service categories separately. The Digital STRI framework is a weighted index covering the following areas:

- i. infrastructure and connectivity, which covers measures related to communication infrastructure essential to engaging in digital trade;
- ii. electronic transactions, which covers issues such as discriminatory conditions for issuing licenses for e-commerce activities, the possibility for online tax registration and declaration for non-resident firms, deviation from internationally accepted rules on electronic contracts, measures inhibiting the use of electronic authentication (such as electronic signature), and the lack of effective dispute settlement mechanisms;
- iii. payment systems which captures measures that affect payments made through electronic means;
- iv. intellectual property rights, which covers domestic policies related to copyrights and trademarks that do not afford foreigners equal treatment with regard to IP protection;
- v. and other barriers affecting trade in digitally enabled services, which cover various other barriers to digital trade, including performance requirements affecting cross-border digital trade (e.g., mandatory use of local software and encryption or mandatory technology transfers); limitations on downloading and streaming; restrictions on online advertising; commercial or local presence requirements; and lack of effective redress mechanisms against anti-competitive practices online, among others.

Table 5: Gravity Estimation with Digital STRI by Service Category for Asian Emerging Economies, Digital Services

	(1)	(2)	(3)	(4)	(5)
	Insurance and pension services	Financial services	Charges for the use of intellectual property n.i.e.	Telecommunication, computer, and information services	Other business services
	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}
STR _{ijt} (origin)	-2.881*** (0.633)	-1.171 (0.734)	-0.998 (1.471)	-5.545*** (0.856)	-3.439*** (0.651)
RTA_{ijt}^{Gonly}	0.100 (0.137)	0.059 (0.218)	-0.657*** (0.225)	0.216 (0.174)	0.165 (0.145)
$RTA_{ijt}^{G\&S}$	0.734*** (0.270)	0.322 (0.202)	0.236 (0.214)	-0.196 (0.165)	0.216 (0.190)
English Proficiency _{it}	2.526*** (0.918)	0.842 (1.283)	3.981*** (1.330)	8.068*** (0.781)	3.086*** (0.676)
Human Capital _{it}	-0.785* (0.413)	1.410*** (0.509)	1.847*** (0.681)	1.263** (0.509)	1.070*** (0.366)
Observations	10,768	10,768	10,733	10,768	10,768
Pseudo R ²	0.863	0.895	0.903	0.965	0.958

Note: PPML estimations. All the estimations include year and importer-year fixed effects, log distance, origin economy log GDP, origin economy GDP per capita, dummy variables for common border, trade agreements, having being part of the same colony, common legislation, and year fixed effects. Robust standard errors clustered by economy pairs in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

Table 5 reports results for specifications including the index for economy of origin. The estimates suggest that digital trade restrictions of the origin economy reduce exports of insurance and pension services, telecommunications, computer and information services, and other business services. English proficiency and human capital in the economy of origin continue to be positively linked to exports of intellectual property charges, telecommunications, computer and information services, and other business services, even with a smaller sample size. Human capital, but not English proficiency, is also positively related to exports of financial services.

To capture the effect of information and communication technology infrastructure impacting services trade we include direct measures of internet and mobile connectivity. Table A.6 reports results for non-digital services in panels A and B and for digital services in panels C and D. The estimations suggest that internet infrastructure is a key factor boosting exports in all digital categories and it also boosts exports of three non-digital categories: transport, travel and construction. The estimated effect is largest for financial services. The pattern of the effects is more mixed for mobile connectivity. It is negatively related to two categories of digital services, telecommunications, computer, and information services and other business services, but

positively related to the exports of two non-digital categories, travel and construction. For the rest of the categories, the estimates are either non-significant or negative. The reason might be that mobile connectivity is becoming so widespread in most economies that the measure no longer captures any marginal effects. In sum, these results suggest that internet connectivity is a crucial factor boosting service exports, particularly digital services.

Table 6 presents the results of the estimations that include the foreign direct investment variable for those service exports that could be matched with the foreign investment data. The FDI variable is positive and significant in the estimations for two of the four categories: telecommunications, computer, information services, and other business. These results are consistent with the narrative that foreign direct investments, together with lower wage costs and English proficiency, are factors driving the growth spurt in business service exports in emerging economies. These services are typically susceptible to business process offshoring, whereby developed high wage-cost economies relocate stages of business services to emerging economies to keep them cost-competitive.

Table 6: Gravity Estimation with FDI for Asian Emerging Economies

	(1)	(2)	(3)	(4)
	Insurance and pension services	Financial services	Telecommunication, computer, and information services	Other business services
	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}
Log Distance _{ij}	-0.573*** (0.092)	-0.232** (0.114)	-0.671*** (0.105)	-0.427*** (0.069)
Log FDI _{kit}	-0.001 (0.004)	0.003 (0.004)	0.014*** (0.005)	0.012*** (0.003)
RTA_{ijt}^{Gonly}	0.187 (0.129)	0.247 (0.212)	0.266 (0.167)	0.242* (0.138)
$RTA_{ijt}^{G\&S}$	0.627*** (0.188)	0.501*** (0.157)	-0.097 (0.129)	0.284** (0.143)
Common Colony _{ij}	-0.000 (0.222)	0.139 (0.197)	0.152 (0.167)	0.694*** (0.173)
Contiguity _{ij}	-0.326 (0.255)	0.017 (0.219)	-0.175 (0.276)	-0.017 (0.170)
Common Legal _{ij}	0.486*** (0.115)	0.627*** (0.125)	0.607*** (0.112)	0.480*** (0.098)
Log GDP _{jt}	0.702*** (0.048)	0.898*** (0.045)	1.222*** (0.054)	0.965*** (0.037)
Log GDP per Capita _{jt}	0.485*** (0.143)	-0.665*** (0.147)	-1.810*** (0.193)	-0.815*** (0.137)
English Proficiency _{it}	3.376*** (1.005)	3.332*** (1.277)	10.296*** (0.897)	3.986*** (0.601)

Continued on the next page

	(1)	(2)	(3)	(4)
	Insurance and pension services	Financial services	Telecommunication, computer, and information services	Other business services
	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}
Human Capital _{it}	-0.878*** (0.244)	0.730** (0.341)	1.459*** (0.366)	1.264*** (0.261)
Observations	23,246	23,246	23,246	23,246
Pseudo R ²	0.833	0.876	0.955	0.951

Note: PPML estimations with year and importer-fixed effects, and robust standard errors clustered by economy pairs in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

As final robustness checks, we use educational attainment as an alternative measure of human capital and include common language as an additional variable in the specification with human capital. Tables A.7 and A.8 report the robustness check estimates. The estimates in Table A.7 are qualitatively like the ones in Tables 3a and 3b, with few exceptions. Educational attainment has a positive and statistically significant effect on exports of all service types except for maintenance and repair services. The impact on maintenance and repair service exports is negative, though it was not precisely estimated when using the human capital index specification. The estimates for English proficiency are generally unchanged, except in two cases: the effect on exports of manufacturing services on physical inputs owned by others is now statistically significant, whereas the effect on exports of charges for the use of intellectual property n.i.e. is no longer statistically significant. The estimates of English proficiency and human capital reported in Table A.8 are similar to the ones in Table 3a and 3b, suggesting that including common language as an additional control variable does not affect the main findings. Only coefficient sizes change.

5. POLICY DISCUSSION

We have examined the influence of various policy-related factors on the growth of service exports in emerging Asian economies. Investing in human capital, particularly in English language skills, allows economies to access international markets for services. Regional trade agreements also play a role in enhancing service exports for all emerging economies. This effect is more pronounced for Asian emerging economies and for trade agreements that include both services and goods trade provisions. The export of services is additionally affected by trade restrictions that exist beyond national borders. Such regulations may deter both domestic and foreign investors from engaging in services production. The regulatory environment in the economy of origin has been found to exert an adverse impact on the export of services. Specifically, digital trade restrictions in the origin economy hinder the export of insurance and pension services,

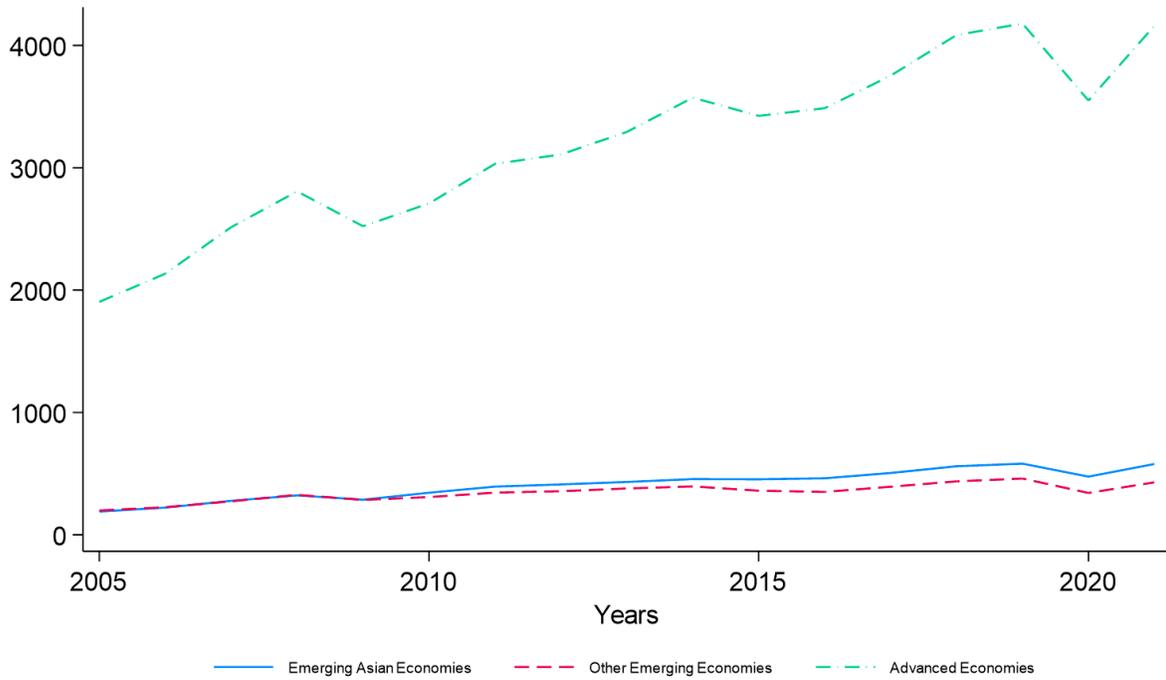
telecommunications, computer, and information services, as well as other business services. Investments in internet infrastructure seem to pay off in increased service exports across all digital categories, as well as for transport, travel, and construction.

6. CONCLUSIONS

The paper's findings underscore the importance of supply-side factors, such as human capital, communication proficiency, and foreign direct investments in shaping service exports globally, particularly developing economies striving to enhance their presence in high-value service sectors. Our results point out that both human capital and incoming flows of FDIs are key factors that explain service export growth, particularly in emerging economies. Moreover, they highlight the critical role of English proficiency in driving the exports of telecommunications, computer, and information services, even among advanced economies. By incorporating a time-varying measure of language skills, our analysis provides a deeper understanding of how acquired English proficiency influences trade over time, reflecting its growing significance in an increasingly interconnected global economy.

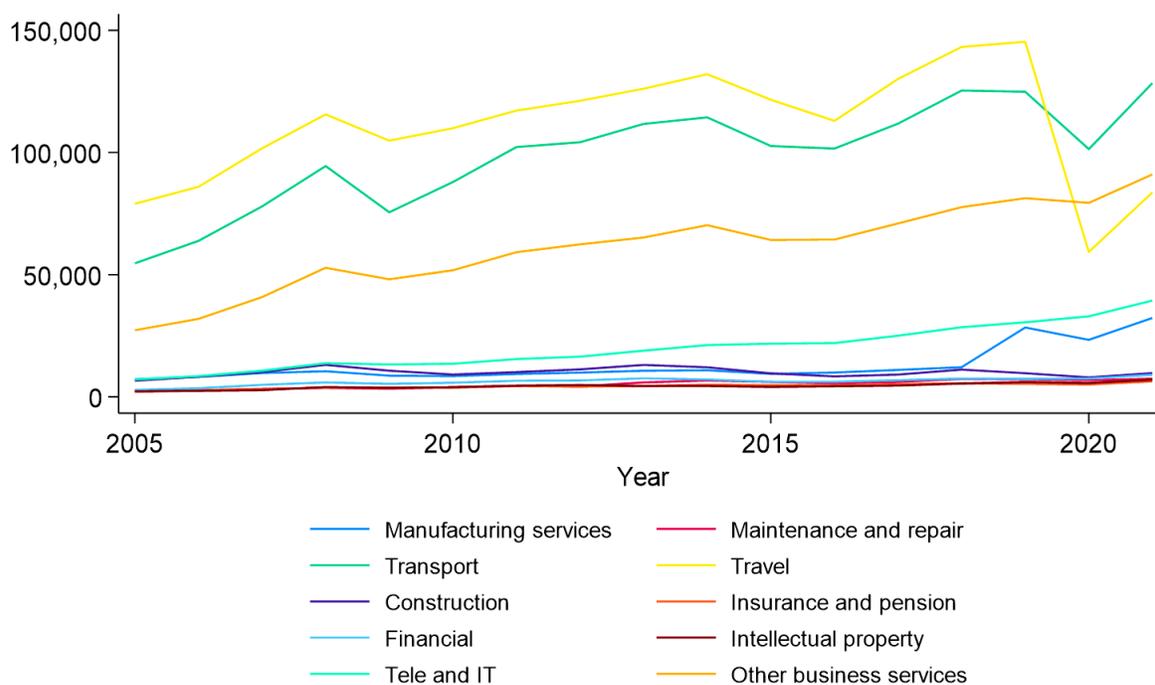
APPENDIX

Figure A.1: Service Exports, Asian Emerging, Other Emerging, and Advanced Economies, 2005–2021 (\$ Billion)



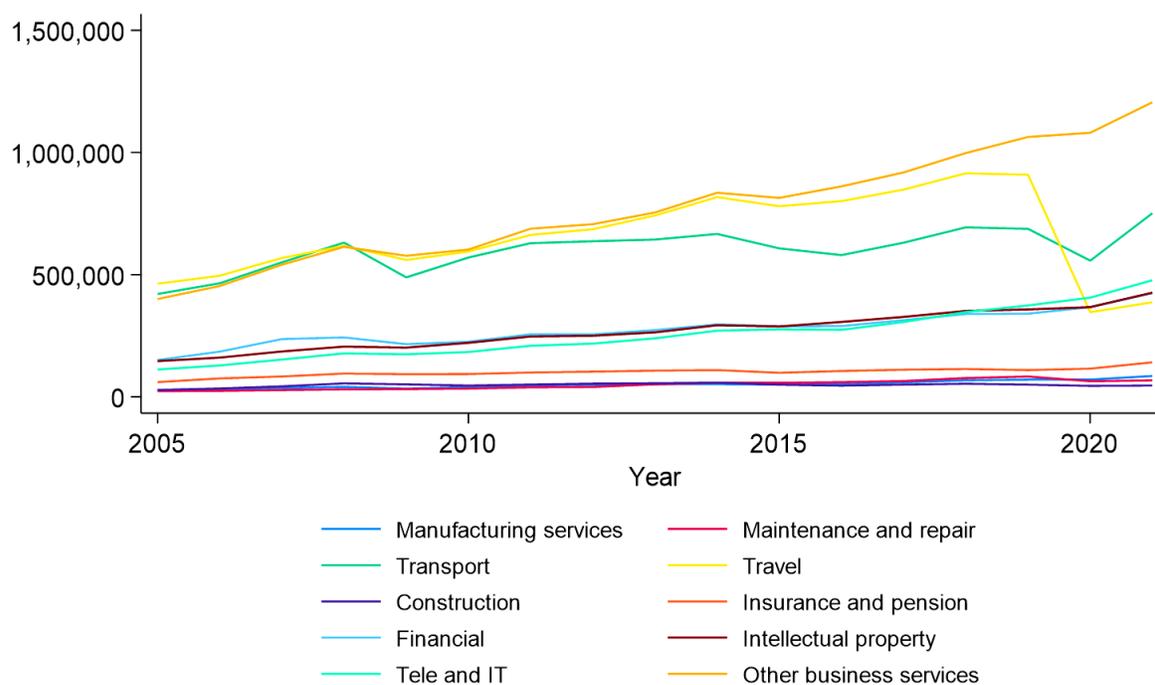
Source: Authors' calculations using data from OECD-WTO Balanced Trade in Services dataset (BaTIS).

Figure A.2: Exports of Services 2005–2021, Other Emerging Economies (\$ Million)



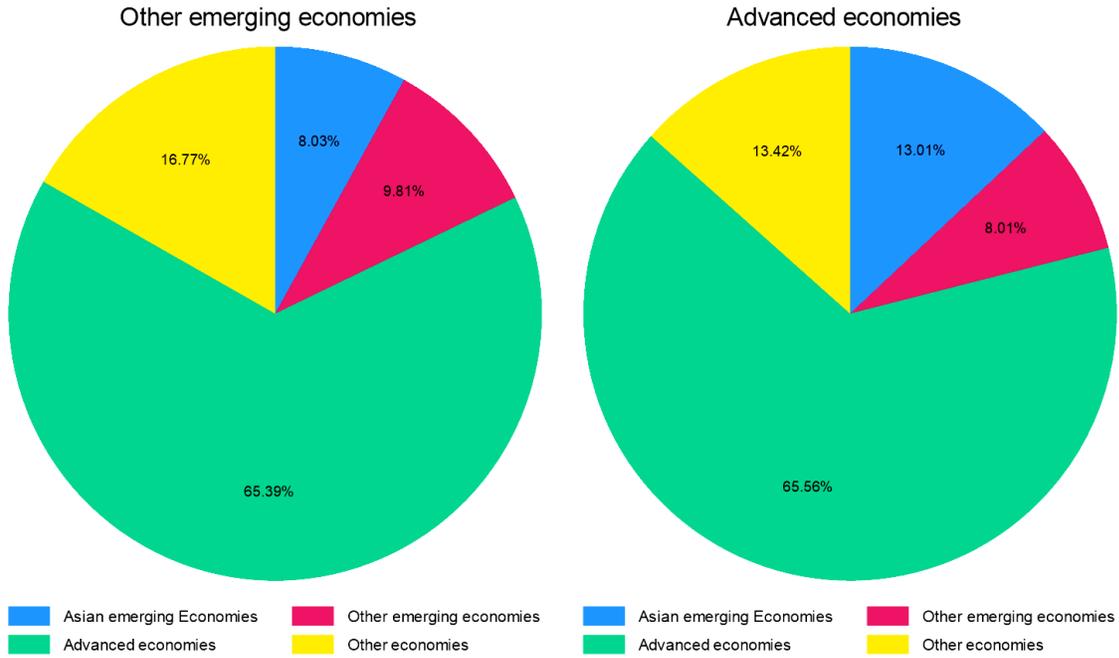
Source: Authors' calculations using data from OECD-WTO Balanced Trade in Services dataset (BaTIS).

Figure A.3: Exports of Services 2005–2021, Advanced Economies (\$ Million)



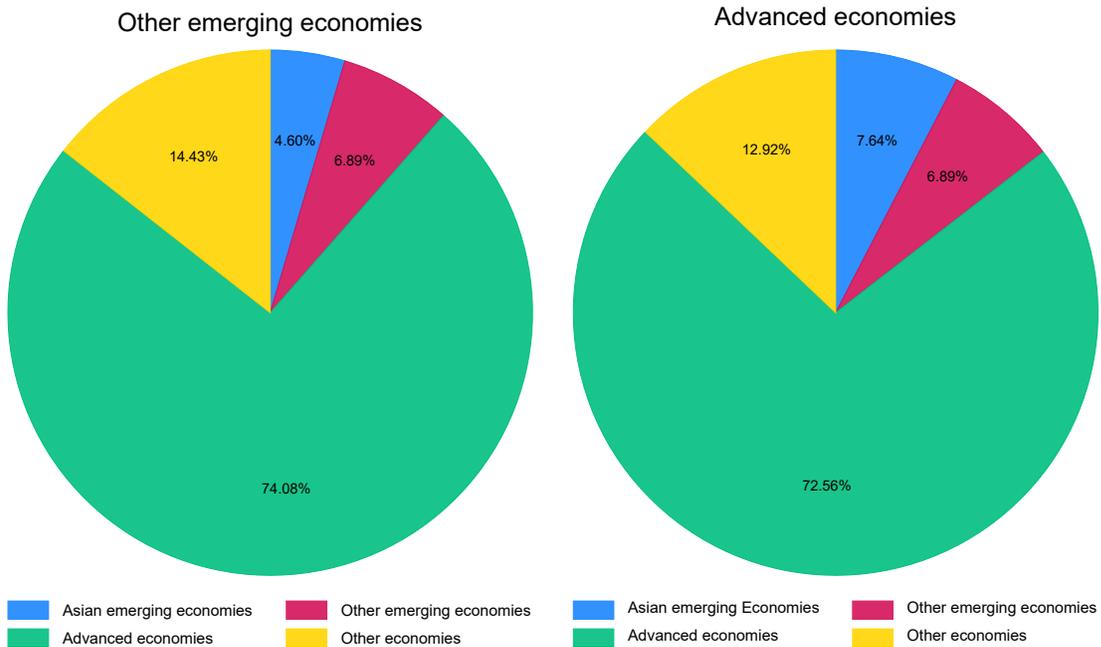
Source: Authors' calculations using data from OECD-WTO Balanced Trade in Services dataset (BaTIS).

Figure A.4: Destination Shares of Total Services Exports of Advanced and Other Emerging Economies, 2019



Source: Authors' calculations using data from OECD-WTO Balanced Trade in Services dataset (BaTIS).

Figure A.5: Destination Shares of Other Business Services and Telecommunications and IT Services Exports of Advanced and Other Emerging Economies, 2019



IT = information technology.

Source: Authors' calculations using data from OECD-WTO Balanced Trade in Services dataset (BaTIS).

Table A.1: Economy Groups

Emerging	Advanced
Argentina	Australia
Bangladesh*	Austria
Brazil	Belgium
Bulgaria	Canada
Cambodia*	Croatia
Chile	Cyprus
People's Republic of China*	Czech Republic
Colombia	Denmark
Egypt	Estonia
Hungary	Finland
India*	France
Indonesia*	Germany
Lao People's Democratic Republic*	Greece
Malaysia*	Hong Kong, China
Mexico	Iceland
Mongolia*	Ireland
Morocco	Israel
Myanmar*	Italy
Nepal*	Japan
Nigeria	Republic of Korea
Pakistan*	Latvia
Peru	Lithuania
Philippines*	Luxembourg
Poland	Macau, China
Romania	Malta
Russia	Netherlands
South Africa	New Zealand
Sri Lanka*	Norway
Thailand*	Portugal
Türkiye	Singapore
Ukraine	Slovak Republic
Viet Nam*	Slovenia
Venezuela	Spain
	Sweden
	Switzerland
	Taipei, China
	United Kingdom
	United States

* Emerging Asian economies.

Source: See text in Section 2.

Table A.2: Mapping of NAICS to EBOPS

EBOPS		NAICS	
SF	Insurance and pension services	524	Insurance Carriers and Related Activities
SF	Insurance and pension services	525	Insurance and Employee Benefit Funds
SG	Financial Services	521	Monetary Authorities-Central Bank
SG	Financial Services	522	Credit Intermediation and Related Activities
SG	Financial Services	523	Securities, Commodity Contracts, and Other Financial Investments and Related Activities
SI	Telecommunications, computer, and information services	51	Information
SJ	Other business services	54	Professional, Scientific, and Technical Services, SJ
SJ	Other business services	55	Management of Companies and Enterprises, SJ
SJ	Other business services	56	Administrative and Support and Waste Management and Remediation Services, SJ

EBOPS= Extended Balance of Payments Services Classification, NAICS=North American Industry Classification System.

Source: Authors.

Table A.3: Gravity Estimation by Total Services for Asian Emerging and Other Emerging Economies with Bilateral (Economy-Pair) Fixed Effects

	(1)	(2)	(3)	(4)
	Asian Emerging		Other Emerging	
	Total Export _{ij}	Export _{kij}	Total Export _{ij}	Export _{kij}
RTA_{ijt}^{Gonly}	0.037 (0.040)	0.036 (0.041)	0.125* (0.064)	0.127** (0.064)
$RTA_{ijt}^{G\&S}$	-0.042 (0.032)	-0.044 (0.033)	0.078* (0.047)	0.074*** (0.047)
Log GDP _{ij}	1.077*** (0.414)	1.234*** (0.431)	-1.043*** (0.220)	-1.131*** (0.218)
Log GDP per Capita _{it}	-0.867*** (0.408)	-1.017** (0.424)	1.454*** (0.214)	1.538*** (0.213)
English Proficiency _{it}	0.401*** (0.097)	0.392*** (0.098)	-0.280 (0.199)	-0.294 (0.101)
Human Capital _{it}	0.306** (0.137)	0.282** (0.140)	-0.031 (0.184)	-0.004 (0.186)
Fixed Effects	Year, Importer-year	Service #Year, Importer-year	Year, Importer-year	Service #Year, Importer-year
Observations	23,076	232,720	36,940	369,400
Pseudo R ²	0.994	0.884	0.985	0.876

GDP = gross domestic product, PPML = pseudo poisson maximum likelihood, RTA = regional trade agreement.
 Note: PPML estimations with either year or year-service category fixed effects and robust standard errors clustered by economy pairs in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
 Source: Authors' calculations.

Table A.4: Gravity Estimation by Total Services for Advanced Economies

	(1)	(2)
	Total Export _{ij}	Export _{kij}
Log Distance _{ij}	-0.480*** (0.040)	-0.481*** (0.040)
RTA_{ijt}^{Gonly}	0.041 (0.108)	0.041 (0.108)
$RTA_{ijt}^{G\&S}$	0.291** (0.113)	0.299*** (0.112)
Common Colony _{ij}	0.240** (0.109)	0.249** (0.110)
Contiguity _{ij}	0.226** (0.091)	0.231** (0.090)
Common Legal Origin _{ij}	0.332*** (0.075)	0.338*** (0.076)
Log GDP _{ij} -Origin	0.523*** (0.028)	0.519*** (0.028)
Log GDP per Capita _{it} -Origin	0.673*** (0.075)	0.679*** (0.075)
English Proficiency _{it}	-0.537 (0.469)	-0.521 (0.470)
Human Capital _{it}	-0.209** (0.095)	-0.228** (0.095)
Fixed Effects	Year, Importer-year	Service #Year, Importer-year
Observations	60,051	600,510
Pseudo R ²	0.910	0.812

GDP = gross domestic product, PPML = pseudo poisson maximum likelihood, RTA = regional trade agreement.

Note: PPML estimations. Robust standard errors clustered by economy pairs in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

Table A.5: Gravity Estimation by Service Category for Other Emerging Economies

	(1)	(2)	(3)	(4)	(5)
	Manufacturing services on physical inputs owned by others	Maintenance and repair services	Transport	Travel	Construction
	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}
English Proficiency _{it}	2.170* (1.144)	2.020 (1.325)	-0.686 (0.580)	1.180*** (0.373)	-2.348*** (0.824)
Human Capital _{it}	-0.505 (0.379)	0.119 (0.442)	0.119 (0.126)	-1.162*** (0.132)	-0.590*** (0.189)
Observations	32,278	36,455	36,940	36,940	36,542
Pseudo R ²	0.834	0.748	0.869	0.893	0.811
	Insurance and pension services	Financial services	Charges for the use of intellectual property n.i.e.	Telecommunication, computer, and information services	Other business services
English Proficiency _{it}	2.801*** (0.781)	3.492*** (0.548)	0.709 (0.737)	2.696*** (0.483)	2.610*** (0.342)
Human Capital _{it}	-0.641*** (0.179)	0.047 (0.226)	1.022*** (0.233)	0.330* (0.196)	0.353* (0.181)
Observations	36,940	36,806	36,069	36,940	36,940
Pseudo R ²	0.714	0.837	0.723	0.852	0.889

GDP = gross domestic product, PPML = pseudo poisson maximum likelihood.

Note: PPML estimations. All the estimations include year and importer-fixed effects, log distance, origin economy log GDP, origin economy log GDP per capita, dummy variables for common border, trade agreements, having being part of the same colony, and common legislation. Robust standard errors clustered by economy pairs in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

**Table A.6: Gravity Estimation for Asian Emerging Economies by Service Category:
Internet Infrastructure and Mobile Connectivity**

	(1)	(2)	(3)	(4)	(5)
Non-digital Services	Manufacturing Services on Physical Inputs Owned by Others	Maintenance and Repair Services	Transport	Travel	Construction
Panel A	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}
Log Internet Servers _{it}	-0.253* (0.130)	0.009 (0.087)	0.199*** (0.038)	0.293*** (0.043)	0.230*** (0.061)
English Proficiency _{it}	2.142 (1.833)	3.286*** (1.193)	-0.588 (0.594)	-4.190*** (0.738)	-0.793 (1.509)
Human Capital _{it}	3.904*** (0.701)	0.104 (0.544)	1.152*** (0.235)	0.537*** (0.198)	0.917* (0.505)
Observations	18,272	18,272	18,272	18,272	18,272
Pseudo R ²	0.862	0.769	0.865	0.842	0.747
Panel B	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}
Log Mobile Users _{it}	0.656 (0.497)	-0.081 (0.360)	0.262** (0.126)	1.567*** (0.144)	0.775*** (0.254)
English Proficiency _{it}	0.444 (2.056)	1.363 (1.366)	-0.446 (0.696)	-4.435*** (0.600)	-0.224 (1.508)
Human Capital _{it}	4.633*** (0.719)	0.331 (0.471)	0.879*** (0.204)	0.653*** (0.183)	0.515 (0.470)
Observations	21,706	21,706	21,706	21,706	21,706
Pseudo R ²	0.859	0.771	0.866	0.865	0.739
Panel C	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}
Digital Services	Insurance and pension services	Financial services	Charges for the use of intellectual property n.i.e.	Telecommunication, computer, and information services	Other business services
Log Internet Servers _{it}	0.307*** (0.075)	0.435*** (0.056)	0.131 (0.092)	0.258*** (0.076)	0.123*** (0.046)
English Proficiency _{it}	2.729*** (1.026)	2.016 (1.462)	4.982*** (1.452)	9.814*** (1.160)	3.773*** (0.703)
Human Capital _{it}	-0.895** (0.440)	1.029*** (0.335)	2.190*** (0.608)	2.087*** (0.421)	1.631*** (0.288)
Observations	18,272	18,272	18,272	18,272	18,272
Pseudo R ²	0.690	0.765	0.803	0.910	0.883
Panel D	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}
Log Mobile Users _{it}	0.201 (0.266)	0.619** (0.299)	-0.276 (0.323)	-1.706*** (0.212)	-0.290 (0.185)
English Proficiency _{it}	2.774** (1.199)	2.021 (1.424)	4.992*** (1.545)	10.543*** (0.966)	3.076*** (0.866)
Human Capital _{it}	-0.962*** (0.317)	0.666** (0.332)	1.554** (0.630)	2.389*** (0.435)	1.431*** (0.274)
Observations	21,706	21,706	21,706	21,706	21,706
Pseudo R ²	0.676	0.757	0.798	0.908	0.887

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PPML = pseudo poisson maximum likelihood.

Note: PPML estimations. All the estimations include year and importer-fixed effects, log distance, origin economy log GDP, origin economy log GDP per capita, dummy variables for common border, trade agreements, having being part of the same colony, and common legislation. Robust standard errors clustered by economy pairs in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

Table A.7: Robustness Check for Estimation for Asian Emerging Economies by Service Category: Educational Attainment (Bachelor's Degree)

	(1)	(2)	(3)	(4)	(5)
	Manufacturing Services on Physical Inputs Owned by Others	Maintenance and Repair Services	Transport	Travel	Construction
Panel A	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}
<i>RTA_{ijt}^{Gonly}</i>	-0.050 (0.407)	-0.116 (0.248)	0.312*** (0.104)	0.794*** (0.130)	0.131 (0.126)
<i>RTA_{ijt}^{G&S}</i>	0.736*** (0.226)	0.139 (0.173)	0.291** (0.131)	0.853*** (0.186)	1.130*** (0.261)
English Proficiency _{it}	5.966*** (1.332)	3.217*** (1.169)	0.313 (0.439)	-4.650*** (0.491)	-0.884 (0.859)
Educational attainment _{it}	0.039*** (0.014)	-0.021* (0.012)	0.058*** (0.009)	0.039*** (0.006)	0.045*** (0.010)
Observations	12,700	13,846	14,100	14,100	14,020
Pseudo R ²	0.916	0.870	0.925	0.912	0.903
	(1)	(2)	(3)	(4)	(5)
	Insurance and pension services	Financial services	Charges for the use of intellectual property n.i.e.	Telecommunication, computer, and information services	Other business services
Panel A	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}
<i>RTA_{ijt}^{Gonly}</i>	0.060 (0.207)	0.842*** (0.179)	-0.518* (0.284)	0.525** (0.233)	0.345** (0.151)
<i>RTA_{ijt}^{G&S}</i>	0.529*** (0.199)	0.305* (0.178)	0.282 (0.202)	0.252 (0.187)	0.315** (0.129)
English Proficiency _{it}	2.713*** (0.850)	1.248 (0.965)	5.778*** (1.586)	10.951*** (0.859)	5.133*** (0.648)
Educational attainment _{it}	0.038*** (0.012)	0.090*** (0.013)	0.090*** (0.025)	0.045*** (0.014)	0.067*** (0.012)
Observations	14,086	14,067	13,749	14,100	14,100
Pseudo R ²	0.849	0.902	0.912	0.956	0.946

n.i.e. =not elsewhere specified, RTA = regional trade agreement.

Notes: PPML estimations. All the estimations include year and importer-fixed effects, log distance, origin economy log GDP, origin economy GDP per capita, dummy variables for common border, having being part of the same colony, common legislation, and year fixed effects. Robust standard errors clustered by economy pairs in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

Table A.8: Robustness Check for Estimation for Asian Emerging Economies by Service Category: Common Language

	(1)	(2)	(3)	(4)	(5)
	Manufacturing Services on Physical Inputs Owned by Others	Maintenance and Repair Services	Transport	Travel	Construction
	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}	Export _{kij}
<i>RTA^{Gonly}_{ijt}</i>	-0.125 (0.352)	-0.043 (0.192)	0.400*** (0.094)	0.605*** (0.093)	0.066 (0.113)
<i>RTA^{G&S}_{ijt}</i>	0.566*** (0.191)	-0.083 (0.127)	0.599*** (0.153)	0.768*** (0.099)	1.473*** (0.357)
English Proficiency _{it}	2.232 (1.891)	3.049*** (1.124)	-0.143 (0.567)	-4.833*** (0.519)	-0.399 (1.076)
Human Capital _{it}	4.529*** (0.606)	0.309 (0.369)	0.905*** (0.193)	0.922*** (0.157)	0.598* (0.308)
Common Official Language _{ij}	-0.056 (0.392)	0.103 (0.282)	0.079 (0.121)	0.669*** (0.102)	0.128 (0.143)
Observations	22,989	22,590	23,060	23,060	23,060
Pseudo R ²	0.941	0.905	0.935	0.903	0.899
	Insurance and pension services	Financial services	Charges for the use of intellectual property n.i.e.	Telecommunication, computer, and information services	Other business services
<i>RTA^{Gonly}_{ijt}</i>	0.298** (0.134)	0.277 (0.216)	-0.047 (0.168)	0.510*** (0.135)	0.419*** (0.113)
<i>RTA^{G&S}_{ijt}</i>	0.633*** (0.192)	0.497*** (0.161)	0.316 (0.230)	-0.035 (0.148)	0.287* (0.147)
English Proficiency _{it}	2.629** (1.048)	3.186*** (1.189)	4.963*** (1.439)	9.437*** (0.997)	3.288*** (0.717)
Human Capital _{it}	-0.784*** (0.249)	0.770** (0.349)	1.382** (0.577)	1.542*** (0.399)	1.389*** (0.270)
Common Official Language _{ij}	0.462*** (0.140)	0.074 (0.155)	0.823*** (0.231)	0.737*** (0.134)	0.572*** (0.119)
Observations	23,060	23,060	22,796	23,060	23,060
Pseudo R ²	0.835	0.875	0.889	0.958	0.954

PPML = pseudo poisson maximum likelihood, n.i.e. =not elsewhere specified, RTA = regional trade agreement. Note: PPML estimations. All the estimations include year and importer-fixed effects, log distance, origin economy log GDP, origin economy log GDP per capita, dummy variables for common border, having being part of the same colony, and common legislation. Robust standard errors clustered by economy pairs in parentheses.

*** p<0.01, ** p<0.05, * p<0.1.

Source: Authors' calculations.

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What Explains the Success of Emerging Asia’s Service Exporters?

This paper examines the determinants of the service exports in emerging Asian economies, focusing on digital services, which have expanded substantially in the region. Utilizing a structural gravity model, the findings indicate that supply-side factors predominantly drive service exports growth, rather than demand factors or trade policies. An in-depth analysis of these supply-side factors underscores the pivotal role of human capital, specifically education and English proficiency, in bolstering exports, especially within the region’s digital business process services sector.

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