WORKINGPAPER No. 03, 2025

Could Commercial Presence Substitute Cross-Border Services Trade?

A Mechanism Behind the Stagnation of Services Tradesphere of Influence

Sara Polo Morcillo







About the author

Sara Polo Morcillo is a Parliamentary Assistant at the European Parliament, where she advises on International Trade (INTA) and on the Special Committee on the Housing Crisis (HOUS). Previously, she provided public policy support at the same institution as a Trainee and as a Visiting Student. She holds a Master in European Economic Studies from the College of Europe, and a Bachelor in International Business from Pompeu Fabra University with an exchange at Singapore Management University. Since the beginning of her academic career, she has focused particularly on trade, specifically between the EU and Asia. She also volunteered at the European Youth Parliament and Understanding Europe Spain. Sara was the winner of the 2024 UNU-CRIS Best Thesis Award at the College of Europe for her thesis entitled Are Bilateral Investment Treaties Substitutes for Cross-Border Trade? Implications for the Comprehensive Agreement on Investment.

About UNU-CRIS

The United Nations University Institute on Comparative Regional Integration Studies (UNU-CRIS) is a research and training institute of the United Nations University, a global network engaged in research and capacity development to support the universal goals of the United Nations and generate new knowledge and ideas. Based in Bruges, UNU-CRIS focuses on the provision of global and regional public goods, and on processes and consequences of intra- and inter-regional integration. The Institute aims to generate policy-relevant knowledge about new patterns of governance and cooperation and build capacity on a global and regional level. UNU-CRIS acts as a resource for the United Nations system, with strong links to other United Nations bodies dealing with the provision and management of international and regional public goods.

The mission of UNU-CRIS is to contribute to generate policy-relevant knowledge about new forms of governance and cooperation on the regional and global level, about patterns of collective action and decision-making.

UNU-CRIS focuses on issues of imminent concern to the United Nations, such as the 2030 Development Agenda and the challenges arising from new and evolving peace, security, economic and environmental developments regionally and globally. On these issues, the Institute will develop solutions based on research on new patterns of collective action and regional and global governance. The Institute endeavours to pair academic excellence with policy-relevant research in these domains.

For more information, please visit www.cris.unu.edu









Abstract

This paper examines one of the mechanisms that may explain why services trade is not taking off by analysing the effect of International Investment Agreements (IIAs) on sector-specific bilateral service trade, using the Poisson Pseudo-likelihood regression model with Multiple Levels of High-Dimensional Fixed Effects (PPMLHDFE) to estimate the gravity equations. The findings provide empirical evidence of a negative correlation—and thus a substitution effect—between Treaties with Investment Provisions (TIPs) and Bilateral Investment Treaties (BITs), which serve as proxies for commercial presence due to their role in fostering FDI and cross-border trade in services. The sector-by-sector analysis suggests that the expansion of mode three of supply may have come at the expense of mode one, hindering overall services trade as businesses prioritised establishing a physical presence over remote service delivery, particularly in sectors such as telecommunications, computer, and information services, insurance and pension services, intellectual property, and transport. However, the balance may be shifting, potentially making the need for commercial presence obsolete as cross-border services can increasingly be provided at arm's length.

Keywords

International services trade, International Investment Agreements (IIAs), Gravity model, Poisson Pseudo-likelihood regression model with Multiple Levels of High-Dimensional Fixed Effects (PPMLHDFE).

Table of Contents

Abstract	3
Table of Contents	4
Executive Summary	5
1. Introduction	6
1.1 Servitisation of the Modern Economy	6
1.2 Modes of Supply in Services Trade and their Relation	9
1.3 International Investment Agreements (IIAs)	12
1.4 IIAs as Catalysts for Commercial Presence	13
2. Empirical Model and Data	14
2.1 Econometric Specification	14
2.2 Data Sources and Description	17
3. Results and Discussion	18
4. Concluding Remarks	26
5. Bibliography	27
Annexes	35
Annex 1: Abbreviations and Acronyms	35
Annex 2: Servitisation by Income Group	36
Annex 3: Modes of Supply Classification	37
Annex 4: Data Sources and Description	40
Annex 5: Robustness Checks	42
Annex 6: Implications for Goods Trade	50

List of Graphs

Graph 1. Comparison between world services and merchandise trade (1980 to 2022)	7
Graph 2. Trade in services as percentage of Gross Domestic Product (GDP) (1990 to 2022)	8
Graph 3. Total world services exports by mode of supply	10
Graph 4. Newly signed International Investment Agreements (IIAs) (1990 to 2024)	12

List of Tables

Table 1. Gravity model regression with CEPII as gravity dataset 22 Table 2. Gravity model regression per type of industry using BaTiS dataset for service trade data and CEPII as gravity dataset 23 Table 3. BaTiS Service Trade Industry Codes 23 Table 4. Gravity model regression with BaTiS for trade data and CEPII for gravity 24 Table 5. Recommended allocation of EBOPS 2010 items to modes of supply according to the Eurostat-WTO model 38 Table 6. Data sources 40 Table 7. Summary Statistics with BaTiS sectorial aggregated data and segregated data 41 Table 8. Gravity model regression with TiVA for trade data and ITPD-E for gravity 44 Table 9. TiVA Service Trade Industry Codes 46 Table 10. Gravity model regression with TiVA for trade data and CEPII for gravity 46 Table 11. TiVA Service Trade Industry Codes 48 Table 12. Gravity model regression with CEPII as gravity dataset including goods trade 51

List of Figures

Figure 1. Literature Review on modes of supply interaction	11
Figure 3. Regression coefficients on TIPs value with BaTiS for trade data and CEPII for gravity data by sector	25
Figure 4. Share of value-added GDP by sector and World Bank income group (1990 to 2022)	36
Figure 5. Ratio of mode 3 to cross-border trade in services by industry (2000 and 2014)	39
Figure 6. Regression coefficients on TIPs value with TiVA for trade data and CEPII for gravity data by sector	49

Executive Summary

For over 25 years, global trade in services has expanded rapidly, accounting for over a fifth of the export earnings of international commerce (Baldwin et al., 2024) and nearly 70% of global trade in value-added terms (OECD, 2018). Services trade has increasingly dominated many economies (Nayyar et al., 2021). It has become the primary driver of the world's economic activity (World Trade Organisation [WTO] & World Bank, 2023), constituting the biggest share of the global economy (WTO, 2019) and reaffirming servitisation (Vandermerwe & Rada, 1988).

Notably, mode 3 (commercial presence) has been the fastest-growing segment of services trade (WTO, 2022), a trend that aligns with the liberalisation of investment (Takamichi, 2020) and the proliferation of International Investment Agreements (IIAs). Similarly, mode 1 (cross-border trade) has also seen significant growth, driven by advancements in digital technologies and increasing connectivity, which have facilitated the seamless exchange of services across borders (WTO, 2023).

In contrast, the share of goods trade has remained largely unchanged (Bohn, 2018), experiencing stagnation (Tomiura, 2023) and a structural slowdown (UNCTAD, 2024) following the global financial crisis and the "Great Trade Collapse" (Baldwin, 2009). In 2023, global trade in goods declined by approximately 2 per cent, the largest contraction outside a recession this century, and by the end of 2024, trade growth had slowed to its weakest five-year period since the 1990s (Kose & Mulabdic, 2024).

Despite extensive efforts to liberalise services trade, its exports remain "over six times lower than goods exports in terms of output ratio" (Hoekman & Kostecki, 2009, p. 331). This raises critical questions: What factor has prevented trade in services from surpassing trade in goods? Is there evidence of a structural substitution effect among different modes of supply? If so, which modes are involved, and what directional trends have emerged in recent years? Could these dynamics be reversed in the future?

This paper seeks to address the gap in the existing literature, making use of the gravity model of international trade (Head & Mayer, 2014) using the Poisson Pseudo-Likelihood regression with Multiple Levels of Fixed Effects (PPMLHDFE), developed by Correia, Guimaraes, and Zylkin (2019). The authors developed the code based on the PPML estimator, which is "the state-of-the-art estimator to obtain unbiased and theory-consistent estimates of the gravity equation" (Esteve-Pérez et al., 2020, p. 2576).

Four levels of high-dimensional fixed effects (FEs) will be used to control for unobserved variables that remain constant over time in contrast to time-varying indicators: (1) reporter-country, (2) partner-country, (3) country-pair, and (4) industry FEs. By providing a sectoral granulation of services, this paper empirically complements previous research assessing that IIAs decrease service exports from developed to emerging economies through analysing services trade data from 1995 to 2006 but aggregating all industries' trade (Xiong & Sun, 2022).

The paper uncovers whether mode 1 and mode 3 of services trade form a complement to each other or a substitute, which previous research has analysed with "thin and inconclusive answers" (Fillat-Castejón, Francois, & Wörz, 2009). However, the evidence tilts towards the former. Previous literature does not use any policy variable to research this question, which this paper does, namely, IIAs as a proxy for commercial presence, given their positive impact on Foreign Direct Investment (FDI).

Data from five different sources from 2005 to 2021 for low, lower-middle, upper-middle and high-income countries is used. First, the CEPII database serves as a gravity dataset. Second, BaTiS and TiVA function as trade datasets—the former capturing modes 1, 2, and 4 of supply and the latter covering all four modes, allowing for the isolation of mode 3's effect. Third, the UNCTAD and Hofmann datasets (Hofmann, Osnago, & Ruta, 2017) provide BIT and TIP dummy variables, respectively. Lastly, the ITPD-E USITC database offers data for robustness checks.

If services trade operates through different modes that are not complementary, particularly if IIAs drive growth in mode 3, which negatively impacts mode 1, it may come at the expense of the latter, potentially confirming substitutability. This could have been a key factor driving the stalemate in overall services trade from 1990 until 2018. However, in the current era of data-intensive digitisation, the balance may be shifting as cross-border services gradually catch up, potentially rendering the need for commercial presence obsolete, given that they can now be delivered at arm's length.

The next section reviews the literature on services trade, its modes of supply, and IIAs as FDI catalysts. Section 2 presents the empirical methodology and data. Section 3 analyses the hypothesis using PPMLHDFE results and examines the substitution between IIAs and cross-border services trade. Finally, section 4 concludes and outlines further lines of research.

1. Introduction

1.1 Servitisation of the Modern Economy

Antràs (2020, p. 8) defines globalisation as a "multi-faceted process involving much more than the flow of goods and services across countries." Started in 1960, the second wave of globalisation was characterised by the reductions in barriers to international transactions (Baldwin & Martin, 1999), and enabled by technology, accompanied by rising intra-industry trade (Ortiz-Ospina, Beltekian, & Roser, 2014). Between 1990 and 2010, countries experienced a de-industrialisation tendency, pointing towards a trajectory where intangibility and service-oriented economies become predominant (Sáez et al., 2014).

The heart of 21st-century trade is the "trade-investment-services-intellectual property nexus" (Baldwin, 2011, p. 2). In this context, emerging economies are transitioning to service-based models sooner and in earlier phases of development (Hallward-Driemeier & Nayyar, 2017, p. 59). Recent "technological changes have made an increasing number of services and tasks more tradable, resulting in a radical expansion in trade" (Hoekman & Kostecki, 2009, p. 321). Nowadays, structural changes are "putting services at the centre of world trade, perhaps heralding a new wave of globalisation" (Loungani et al., 2017, p. 3).

Services are "vital to the functioning of any economy" (Hoekman & Kostecki, 2009, p. 318). From 1990, trade in services has grown from 9% of GDP to almost 30% across the EU (see Graph 1). For the period 2000 to 2014, the share of services in exports of value-added grew over time, whilst the share of manufacturing remained constant or grew relatively less (Bohn, 2018, p. 2732). Especially since 2001, world services trade has expanded with an annual average growth rate of 10.7% against a similar growth

rate of 6.6% for the period 1990 to 1999 (van der Marel & Shepherd, 2013). Currently, services exports account for over "a fifth of export earnings globally" (Baldwin et al., 2024, p. 18).

Covid-19 seriously distorted services trade from 2020; while some sectors have already recovered, others, such as travel and transport, are still on the mend. World trade in services has been expanding rapidly (WTO, 2019, p. 7), growing faster than trade in goods, which peaked as a share of GDP in 2008, right before the "Great Trade Collapse" (Baldwin, 2009), a development that researchers viewed as a "wake-up call" (Baldwin, 2022). Given that trade in services, as a ratio to GDP, continues to expand and shows no tendency to decelerate, it has become imperative to contribute to the development of the literature on trade in services.



Graph 1: Comparison between world services and merchandise trade (1980 to 2022) **Source**: author's calculations based on World Bank Data, 2024.

The contribution of services to economies has increased over time. Between 1980 and 2015, the weight of services in value added to GDP increased at all income levels, notably from 61% to 76% in developed economies. However, the share of services has increased particularly strongly in developing countries (OECD, 2002), going from 42% to 55% (UNCTAD, 2017). In 2009, services accounted for more than 70% of economic activity in high-income countries (HIC) (Hoekman & Kostecki, 2009, p. 319). However, service exports in emerging economies have been "rising faster since the mid-2010s" (Baldwin et al., 2024, p. 24), contributing at least 35% of the value added to GDP in the lowest-income countries (LIC) (World Development Indicators, 2024). Baldwin et al. (2024) argue that services trade is a more promising path for developing countries interested in exported-led growth than industrialisation.

The value of total service exports rose to \$ 6.1 trillion in 2021, accounting for around 17.2% of total global exports (UNCTAD, 2021). Services account for one-third of value-added in manufacturing sales and exports (Miroudot, 2017), reaffirming the concept of servitisation (Vandermerwe & Rada, 1988) of the economy. This shift reflects the transition from traditional product provision to service-oriented business models (Qi et al., 2020), transforming the manufacturing sector as it increasingly relies on external services as inputs rather than internal activities (OECD, 2018). Baldwin (2022) explains that divergence between the growth of services versus goods happened because digital technology opened the door to trade in intermediate services.



Graph 2: Trade in services as percentage of Gross Domestic Product (GDP) (1990 to 2022) **Source**: author's calculations based on data from the World Development Indicators database, 2024.

Three structural forces have influenced the proliferation of trade in services: (i) the country's level of development, (ii) the size of the population, and (iii) the policy costs. These forces have enabled the three main channels through which efforts to liberalise trade in services have been pursued: (i) technological change, (ii) connectivity, and (iii) reduction of trade barriers. Despite significant services trade liberalisation efforts, their trade flows are lower than expected. In the following paragraphs, we discuss the forces, the channels, and the liberalisation efforts of the services in detail, arguing that we would have expected higher service trade flows.

The first structural force is the country's **level of development**, as rising incomes favour a shift towards services activities (Yi & Koopman, 2019, p. 69), proving that services trade is the highest among advanced economies (see Graph 2). As countries become more productive, they tend to subcontract less sophisticated activities like manufacturing, consequently driving up the demand for services. In this line, Berlingieri (2014, p. 29) found that outsourcing accounted for 36% of the total increase in services employment, which was mostly concentrated in the professional and business sectors. Cruz and Nayyar (2017, p. 36) decomposed growth in professional and technical services and found similar results. Second, the **size of the country's population** (Yi & Koopman, 2019, p. 106), as the bigger a country is, the more it is investing in services because of economies of scale. Third, the lower the policy costs, the more a country will trade services (Anderson et al., 2018, p. 3). In effect, over the last two decades, trade costs in services have declined at about the same rate as manufacturing (Yi & Koopman, 2019, p. 84).

The structural forces mentioned above have set the stage for efforts to liberalise trade in services, which have unfolded across three main areas. First, advances in **technological change** (Loungani et al., 2017, p. 3), specifically information and communications technology (ICT) (Freund & Weinhold, 2002, p. 236), whose service exports "more than doubled between 2005 and 2017" (Yi & Koopman, 2019, p. 89), contributing to the fall in trade cost, and thus, to services proliferation. Second, **connectivity** has helped reduce transportation costs through investment in physical and digital infrastructure (Yi & Koopman, 2019, p. 9). Third, **trade barriers**, typically in the form of regulations that restrict supply or increase costs, remain significantly higher for services than for goods. Although their number is considerably greater, nearly doubling those in goods in recent years (WTO & World Bank, 2023, p. 69), they are declining at a faster pace (Baldwin et al., 2024, p. 32).

However, as Borchert, Gootiiz, and Mattoo (2014, p. 185) empirically demonstrate, systematic elimination of trade barriers without complementary regulation reform is "not desirable in all sectors." In this regard, the General Agreement on Trade in Services (GATS) (1995) was the first and only multilateral trade agreement that established a multilateral framework of rules and principles for trade in services (WTO, 2022). It was ranked among the "chief accomplishments of multilateral trade diplomacy"

(OECD, 2002, p. 13). A mandate for future trade liberalisation was inscribed directly into the GATS (WTO, 2022), and successive rounds of negotiations occurred until today, permitting member countries to "undertake the progressive opening of service sectors at their own pace" (OECD, 2002, p. 11). As van der Marel and Sheperd (2013, p. 1401) put it, deep integration, including regulatory reform and behind-the-border barriers, "can produce [genuine] liberalisation in services trade."

In spite of the fact that WTO is still the basis of most trade agreements, traditional trade policy areas, such as services trade, are now more frequently negotiated in Preferential Trade Agreements (PTAs) rather than at the WTO (Mattoo, Rocha & Ruta, 2020). In this regard, there has been a rapid proliferation of newly signed International Investment Agreements (IIAs), which have been one of the major efforts in services trade liberalisation, particularly through mode 3 of supply, and which we will detail in subsequent sections.

Moreover, efforts to enhance goods trade are expected to lead to more services trade (Ceglowski, 2006; Ariu et al., 2019), as "services can be traded internationally in an indirect way, as part of exported goods" (Cernat, 2024), which some authors have defined as "services traded in boxes" (Cernat, 2014), or even "mode 5 of supply" (Antimiani & Cernat, 2018; Cernat, 2024), but which this paper does not contemplate given that they are not subject to the existing international trade regime under the WTO GATS. Simultaneously, service sales have a positive impact on the performance of manufacturing firms (Crozet & Milet, 2017). Overall, liberalising goods and services trade jointly brings "substantial complementarities" (Ariu et al., 2019, p. 173), and bilateral trade in goods was found to explain bilateral trade in services (Lennon, 2009), still moving in lockstep with each other (OECD, 2017, p. 19).

Nevertheless, despite significant trade liberalisation efforts in the services sector through numerous means, actual **services trade flows remain lower than expected**. Services trade growth remains relatively modest, and its share of GDP in 2024 is nearly four times smaller than that of goods. While its overall share has increased, its expansion since 1999 has been notably slow. Still, in OECD countries, service exports are typically "over six times lower than goods exports in terms of output ratio" (Hoekman & Kostecki, 2009, p. 331). Even more strikingly, cross-border services trade (mode 1 of supply) represents "only about 20% of total services trade and has remained fairly constant for decades" (OECD, 2017, p. 30).

This raises a fundamental question: Why is the services trade not taking off despite considerable liberalisation efforts? What could explain this missing trade phenomenon (Trefler, 1995)? Is there evidence of a **structural substitution effect** among different modes of supply? Furthermore, if such a substitution effect exists, which modes of supply are involved, and what directional trends have emerged in recent years? Could these dynamics be reversed in the future? This paper seeks to address these questions by analysing whether substitution or complementarity exists between different modes of supply, taking IIAs as a proxy for the third mode of supply in services trade, namely, commercial presence, which remains largely underreported in the trade literature.

1.2 Modes of Supply in Services Trade and their Relation

Trade in services is composed of so-called different modes of supply through which foreign service providers can trade services, which were defined by the General Agreement on Trade in Services (GATS) in 1995 under the World Trade Organisation (WTO) framework. Mode 1 is cross-border supply, which involves the supply of a service from the territory of one country into the territory of another (Hoekman & Kostecki, 2009, p. 319). Mode 2 is consumption abroad, when the supply of a service in the territory of one country to the consumer of another country, as defined by the European Commission (2022). Mode 3 is commercial presence, in which the service is provided by a foreign affiliate, as defined by GATS (1995). While data regarding foreign direct investment (FDI) in services may not directly represent mode 3 services, the increasing significance of FDI in services nevertheless "hints at a similar trend for mode 3 trade" (Echandi & Sauvé, 2020). Last, mode 4 is the presence of natural persons, which involves the movement of individuals to supply a service in another country (GATS, 1995).



Graph 3. Total world services exports by mode of supply **Source**: author's elaboration with data from World Trade Organisation, 2022.

Historically, mode 3 of supply (commercial presence) has dominated services trade, reflecting the establishment of foreign affiliates by multinational enterprises to provide services locally, such as in construction services. While mode 2 (consumption abroad), such as tourism and education, has also played a significant role, technological progress has increasingly enabled the growth of mode 1 (cross-border supply), particularly regarding digitally enabled services (WTO & World Bank, 2023). Mode 4 (movement of natural persons), involving the temporary presence of individuals to deliver services, remains comparatively limited, hindered by restrictive immigration and labour policies (Borchert & Mattoo, 2009). Recent developments in digitalisation and e-commerce are transforming services trade (UNTAD, 2024), creating hybrid delivery models that transcend traditional mode definitions –even some authors are already contemplating mode 5 of supply as a complementary mode mixing goods and services, as mentioned previously.

Analysing both the TiSMoS and TiVA databases, authors have found insights into how countries differ in their services trade performance. Concretely, mode 1 is the primary mode of supply for a diverse range of countries, including developing nations such as Morocco, India, and the Philippines or EU Member States (Cernat, 2024). In the EU, mode 1 accounts for 31% of total service exports, while mode 3 dominates with 59%. This pattern aligns with broader global trends, where mode 3 serves as the primary mode of supply for many OECD countries and several developing and emerging economies, including China (Cernat, 2024).

Some services are predominantly supplied through one mode, and others through all four modes, acting as complements to one another (Khachaturian & Oliver, 2021, p. 1). Concretely, however, whether mode 1 of supply is **complementary** to the other modes of supply in services is not a new question in the academic literature. Various authors have argued the ambiguity of the matter without drawing clear conclusions on it and with inconclusive findings. For example, Xiong and Sun (2022, p. 2542) claim that services through mode 3 can be complementary or substitutive of modes 1, 2, and 4. Also, some authors claim that conceptually, cross-border services trade and foreign affiliate sales may be "substitutes or complements" (Fillat-Castejón, Francois, & Wförz, 2009, p. 6). Moreover, Fontagné and Pajot (2001, p. 240) study the relationship between trade and FDI, claiming that there is more complementarity at the aggregated level, which is less ascertained at the disaggregated level.

On the one hand, previous research has demonstrated that the modes of supply that make up trade in services are **complementary** (Mattoo, Mulabdic, & Ruta, 2022, p. 1603). Grünfeld and Moxnes (2003) found the first evidence of a

complementary between residuals of cross-border trade and FDI. Buch and Lipponer (2004) claim that cross-border trade and FDI are complements and not substitutes. Hoekman and Kostecki (2009) argue that other modes may supplement the delivery of a service through a mode. For example, investment can be found in modes 3 and 4 as a prerequisite for the successful provision of services across borders (Nielson & Taglioni, 2003). Van der Marel and Shepherd (2013) found complementarity in business, financial and insurance services across modes 1 and 3 by analysing the World Bank Services Trade Restrictiveness Indices (STRIs). Khachaturian and Oliver (2021) found a negative impact of mode 3 barriers on cross-border trade, suggesting an inter-modal complementarity.

Furthermore, several authors have argued that once investments are made, a complementarity between investment and other modes of service trade is to be expected (Jansen & Piermartini, 2004; Lennon, 2008; OECD, 2006; WTO, 2001). Moreover, an increase in the ratio of FDI and GDP is often associated with a higher level of globalisation (Pekarskiene & Susniene, 2015). Last, Moshirian (2004) found a positive significant relationship between FDI, the proxy of mode 3 of supply, and cross-border financial services. In all, some research claims that the growth in the services trade has "resulted from the interplay of several mutually reinforcing factors" (WTO & World Bank, 2023, p. 6).

On the other hand, although **substitutability** has been underexplored, empirical evidence can still be found. Lamperecht and Miroudot (2020) find a substitution between the telecommunication and cross-border services sectors. Riker (2015) finds that higher mode 1 barriers increase foreign affiliate sales, suggesting that cross-border trade and foreign affiliate sales are substitutes, however, without segregating per sector, as this paper does. Van der Marel and Shepherd (2013) segregate per service but only find evidence of inter-mode supply substitution in transport services, while other sectors indicate complementarity between modes 1 and 3 of supply. Chanda (2006, p. 30) argues that in retail distribution services, there is evidence of commercial presence being substituted by e-commerce with the virtual supply online of customer services. Moreover, Chanda (2006, p. 31) claims substitutability between mode 3 and accountancy services, given that establishing a branch overseas is substituted by providing Internet services, using PriceWaterhouse Coopers as an example.

Mode 3 of supply through different proxies							
Independent variable	Complementarity	Substitutability	Ambiguity				
Cross-border services trade	Buch and Lipponer (2004) Grünfeld and Moxnes (2003) Khachaturian and Oliver (2021)	Riker (2015)	Fillat-Castejón, Francois, and Wförz (2009)				
Business, financial and insurance services	Van der Marel and Shepherd (2013)	NE	NE				
Financial services	Yamori (1998) Moshirian (2004)	NE	NE				
Mode 1, 2 and 4	Hoekman and Kostecki (2009) Nielson and Taglioni (2003)	NE	Xiong and Sun (2022)				
Aggregated services trade	NE	NE	Fontagé and Pajot (2001)				
Telecommunication services	NE	Lamperecht and Miroudot (2020)	NE				
Transport services	NE	Van der Marel and Shepherd (2013)	NE				
E-commerce activities	NE	Chanda (2006)	NE				
Accountancy services	NE	Chanda (2006)	NE				

Note: NE means no evidence on the matter was found.

Figure 1: Literature review on modes of supply interaction Source: author's elaboration.

Overall, as shown in Figure 1, the effect of mode 3 on the four modes of supply and aggregate services trade remains ambiguous. However, when examining specific industries, empirical research suggests a different pattern. In particular, there is evidence that mode 3 can act as a substitute in certain sectors, such as telecommunications and transport services, and even some authors have found evidence of a substitutability effect between mode 1 and mode 3 (Riker, 2015). This implies that an expansion of one mode may come at the expense of another, highlighting potential trade-offs in firms' internationalisation strategies. Regarding the proxies used in existing empirical works, research has not yet employed IIAs as a proxy for mode 3 of supply in services trade. In this regard, this paper aims to offer an innovative outlook to the empirical question, covering the literature gap by analysing the effect of IIAs in modes 1, 2, and 4 of services trade on aggregate. Subsequently, the paper offers a more detailed study by analysing IIAs' effect on the different disaggregated services trade industries.

1.3 International Investment Agreements (IIAs)

The current regime of International Investment Agreements (IIAs) is a patchwork that contains two types of agreements: (1) **Bilateral Investment Treaties** (BITs) and (2) **Treaties with Investment Provisions** (TIPs) (Marx & Mattioli, 2023, p. 70). Firstly, BITs are pure investment agreements between two countries aimed at "reciprocally protecting and stimulating investments" (Marx & Mattioli, 2023, p. 75), establishing the terms and conditions for private investments made by individuals and business entities from one state to another, and they make up the majority of IIAs (UNCTAD, 2024). Traditionally, investment issues were handled in BITs (UNCTAD, 2007; ESCAP, 2016), representing 1990 to 2018 between 98% and 68% of the total of IIAs. However, while the number of BITs continued to rise, this trend has increasingly been accompanied, and possibly surpassed, by a growing preference among states to incorporate investment provisions into trade agreements (Crawford & Kotschwar, 2018, p. 2). In this context, TIPs, such as Free Trade Agreements (FTAs), Economic Partnership Agreements (EPAs), Regional Trade Agreements (RTAs) or PTAs, have become key instruments within broader regional or plurilateral economic frameworks that regulate investment-related matters (Marx & Mattioli, 2023, p. 82).

From 1990 onwards, there has been a rapid proliferation of newly signed IIAs (UNCTAD, 2015, p. 121) as policymakers increasingly view them as "a tool to create a stable investment environment to spur international trade" (Heid & Vozzo, 2020, p. 1), coinciding with "the second unbundling" (Baldwin, 2006, p. 22). Nevertheless, most IIAs in force in 2025 were implemented after 1990 (Vandevelde, 2009, p. 4), providing companies with greater certainty regarding tax regimes and profit transfers. Graph 4 shows that the cumulative number of newly signed IIAs went from 76 in 1990 to 3,457 in 2024. At the end of 2005, more than 2,500 cumulative IIAs were signed, and in 2006, "on average, more than one was concluded per week" (Egger & Merlo, 2007, p. 1241). This evolution can be explained on the one hand by the increased role of developed countries as capital and technology exporters and emerging economies as importers, which makes them actively seek IIAs (UNCTAD, 2005). On the other hand, as the density of IIAs increased, the domino effect started, as they became a trend to gain legitimacy and recognition without a full understanding of their burdens for certain groups of countries (Jandhyala, Henisz, & Mansfield, 2011, P. 1047).



Graph 4: Number of newly signed International Investment Agreements (IIAs) (1990 to 2024) **Source:** Author's elaboration with data from UNCTAD (2024).

According to UNCTAD (2015, p. 121), more than half a century after the first IIA was concluded, their history can be divided into four main phases: the era of infancy (1950 to 1964), the era of dichotomy (1965 to 1989), the era of proliferation (1990 to 2007), and the era of re-orientation (2008 onwards). Specifically, 2,663 new IIAs were concluded during the era of proliferation out of a total of 3,067, as illustrated in Graph 3. However, in the subsequent era of re-orientation, the pace of bilateral treaty-making slowed considerably. At the same time, the conclusion of regional IIAs, particularly TIPs, gained significant momentum (UNCTAD, 2015, p. 124), reaching its peak in 2019, with more than 20 TIPs signed. Other authors (Jandhyala, Henisz, & Mansfield, 2011) note that there have been three different waves of IIAs: (1) the first wave characterised by IIAs signed between developed countries and EMDEs, (2) the second wave characterised by the signing of more IIAs between EMDEs, and (3) the third wave marking a slowdown in IIAs growth.

1.4 ILAs As Catalysts for Commercial Presence

IIAs introduce several key factors that influence FDI (UNCTAD, 2009), including favourable conditions for investors, a regulatory environment conducive to business and investment, and measures to harmonise national investment frameworks (ESCAP, 2016, p. 12). Limão (2016, p. 10) affirms that "76% of Preferential Trade Agreements (PTAs) include at least one provision related to investment such as (i) the liberalisation of capital movement and prohibition of new restrictions (58%) and (ii) requirements for local content and export performance of FDI (45%)." In this regard, PTAs that liberalise trade in services include a chapter that extends investment provisions beyond the third mode of supply in services, establishing a broader regulatory framework that covers goods, intellectual property, and portfolio investment (Crawford & Kotschwar, 2018, p. 2). Similarly, IIAs increasingly incorporate issues such as sustainable development or transparency rules on subsidies, among others, seeking not only trade benefits but also international integration in other dimensions (Swenson, 2008, p. 2).

Empirical research aimed at evaluating the impact of IIAs (or BITs specifically) on FDI flows has proliferated since the late 1990s, coinciding with a surge in the signing of these investment treaties between developed countries and emerging markets and developing economies (EMDEs) (Gopalan et al., 2023, p. 471). The recent question in the literature has been the extent to which investment agreements stimulate investment in practice (Horn & Tangerås, 2021), as empirical evidence has remained ambiguous "as to the overall benefit of IIAs in driving FDIs" (ESCAP, 2016, p. 10). Researchers have largely analysed the effectiveness of IIAs in attracting FDI flows, a factor closely linked to the third mode of supply in services (Greenaway, Loyd, * Milner, 2001). However, empirical findings on this relationship remain inconsistent, and the literature is inconclusive about whether IIAs matter in attracting more FDI inflows (Gopalan et al., 2023, p. 473).

Certain authors observe a positive correlation between BITs and FDI influxes (Allee & Peinhardt, 2011; Busse, Königer, & Nunnenkamp, 2010; Büthe & Milner, 2008; Egger & Merlo, 2007; Egger & Pfaffermayr, 2004; Neumayer & Spess, 2005; Salacuse & Sullivan, 2009; Teo, 2021). Even if BITs have a larger international trade flow effect than RTAs without an investment chapter (Heid & Vozzo, 2020, p. 1), this impact is not limited to BITs (ESCAP, 2016, p. 11). In this context, Takamichi (2020, p. 8) states that "the establishment of investment or market access is treated as a trade in services issue similar to the third mode of GATS, so it is addressed in FTAs and EPAs." Investment provisions in RTAs or EPAs have a larger impact on FDI than BITs (Lesher & Miroudot, 2007) if they offer liberal admission rules (Berger et al., 2010). This effect could be attributed to "informational effects that make parties institutionalise their commitments to liberal economic policies, making them credible and thus boosting FDIs" (Büthe & Milner, 2008). Regarding the type of income classification country that is more positively affected, research has demonstrated that IIAs are a key instrument in the strategies of developing countries to attract FDI from developed (UNCTAD, 2009; Berger et al., 2010). Moreover, developing countries that engage in IIA programs increase their attractiveness for FDI and tend to receive more FDI (UNCTAD, 2009).

On the other hand, some authors report no discernible impact of BITs on FDIs (Aisbett, 2007; Blonigen & Piger, 2014; Hallward-Driemeier, 2009; Tobin & Rose-Ackerman, 2003; Salacuse & Sullivan, 2005; Webb & Yackee, 2008). In a more recent study, Brada et al. (2021) conducted a meta-regression analysis on IIAs and FDI flows, concluding that the impact of IIAs on FDI is minimal and insignificant. Moreover, IIAs obligations can also impose costs on developing countries, "limiting their ability to take [necessary legislative and administrative] actions to advance and protect their national interests" (Salacuse & Sullivan, 2005, p. 77). However, some of these authors joined in a positive assessment of BITs' impact on FDI years later by increasing the countries' sample (Tobin & Rose-Ackerman, 2006), increasing the time span for the FDI data, or by considering the signalling effect of BITs. IIAs are an important part of shaping investment decisions, as they "promote and protect investments made by investors from respective countries in each other's territory" (Houde & Yannaca-Small, 2004, p. 3), ameliorating the condition of investors and their investments (Vandevelde, 2009, p. 4). However, they cannot guarantee the inflow of FDIs, since they are only one element within the overall policy framework (UNCTAD, 2014, p. 9), and some scholars even suggest that they may only be effective under specific conditions. Therefore, factors beyond IIAs, such as the size of the host market, trade openness, infrastructure quality or labour cost (Islam & Beloucif, 2023, p. 1), emerge as "key pull factors" of FDI attractiveness (Gopalan et al., 2023, p. 471). For example, major developing economies like Brazil, China, India, and South Africa attract substantial FDI inflows, including from countries with which they lack an IIA framework (UNCTAD, 2014, p. 8), which highlights the inherent limitations of legal instruments in directly influencing economic outcomes (Berger et al., 2011; Hallward-Driemeier, 2003; Neumayer & Spess, 2005).

This paper assumes that IIAs can influence a company's decision on where to invest, as they provide substantive protections to the foreign investor (Colen et al., 2016, p. 193), and establish procedures for enforcement (Shima, 2015, p. 10), signalling the host country's commitment (Gopalan et al., 2023, p. 473). The effect is found stronger in the case of Preferential Trade and Investment Agreements (PTIAs) [TIPs] than in BITs (UNCTAD, 2009, p. 12), given that they influence a wider range of policy and economic determinants of FDI (UNCTAD, 2014, p. 7). The third mode of supply essentially consists of foreign affiliate sales by the multinational enterprises after their investments since it "incorporates specific commitments regarding the establishment [of trade in services] through commercial presence" (Echandi et al., 2021, p. 2). Moreover, even some recent studies use the Foreign Affiliate Statistics to quantify mode 3 of supply (Eurostat, 2021), given that governments still do not systematically gather data on all supply modes (Baldwin et al., 2024).

Overall, IIAs encompass investment in a foreign country, facilitating the third mode of supply in services trade: establishing a commercial presence. Therefore, if trade in services operates through different modes of supply and these modes are not complementary, particularly if the ratification of IIAs induces the growth of mode 3, which negatively impacts the growth of mode 1, it may come at the expense of the latter, potentially confirming substitutability. It could have been a key factor driving the stalemate or stagnation in overall services trade from 1990 until 2021.

This hypothesis would be confirmed if, using the gravity model and controlling for (1) Services Preferential Trade Agreements (SPTAs); membership to (2) GATT, (3) OECD, (4) EU; (5) ratification of a Free Trade Agreement (FTA) on the WTO basis; having (6) colonial ties; (7) common language; or (8) contiguous borders, IIAs were found to cause lower services trade. Thus, the empirical analysis could suggest that IIAs, used as a proxy for commercial presence, serve as substitutes rather than complements for cross-border services trade. Moreover, gravity model estimates will underpin the extent to which export services trade changes due to the introduction of a TIP between the reporting and partner country, using data for economies of all types of income classification. Subsequently, the paper will segregate data by industry and country type to draw specific, targeted conclusions on which industries drive this effect.

2. Empirical Model and Data

2.1 Econometric Specification

The gravity model is "the workhorse of the applied international trade literature" (Shepherd, 2019, p. 4) and "one of the most successful empirical models in economics" (Anderson, 2011, p. 2). The primary emphasis of the gravity model of international trade is inspired by Newton's law of gravitation, and it lies in the idea that trade between two countries depends on their economic weight and their distance. In its most simple expression, the gravity model adopts the following structure (Tinbergen, 1962):

$$TRADEEXP_{ijt} = G \cdot \frac{Y \frac{\beta_1}{it} \cdot Y \frac{\beta_2}{jt}}{D \frac{\beta_3}{ij}}$$
(1)

Where the export trade flows from reporter country i to partner country j in year t (TRADEEXPijt) are explained by Yit and Yjt, which are the nominal GDP for both countries in year t. The term β_1 and β_2 are additional free parameters, and Dij is the simple

distance between the two most populated cities in countryi and partner countryj. Since its introduction, different authors have applied the gravity model in economic theory (Anderson, 1979; Bergstrand, 1985, 1989, 1990; McCallum, 1995; Rose, 2000). However, the most used expression of the gravity model for estimating international trade, and on which this paper is based, is the following, coined by Anderson et al. (2018, p. 6):

$$TRADEEXP_{ij} = \left(\frac{t_{ij}}{\Pi_i \cdot P_j}\right)^{1 - \sigma} \cdot Y_i \cdot E_j$$
(2)

Where TRADEEXPij represent the export trade flows from reporter country i to partner country j, t captures bilateral trade frictions between country i and country j; sigma represents the elasticity of substitution among goods, Yi is the production in country i and Ej is the expenditure in country j. Moreover, the Multilateral Resistance Terms (MRTs), coined by Anderson and van Wincoop (2003, p. 170) refer to non-directly observable theoretical constructs and thus of paramount importance to control (Baldwin & Taglioni, 2006, p. 27) and are "at the heart of the general equilibrium (GE) analysis [of the structural gravity model system]" (Yotov et al., 2016, p. 71). This paper controls MRTs by means of establishing fixed effects (FEs) estimations, which also absorb other unobservable country-specific characteristics, as recommended by Yotov et al. (2016), as follows:

$$P_j^{1-\sigma} = \sum_i \left(\frac{t_{ij}}{\Pi_i}\right)^{1-\sigma} \cdot Y_i$$
⁽³⁾

$$\Pi_{i}^{1-\sigma} = \sum_{j} \left(\frac{t_{ij}}{P_{j}}\right)^{1-\sigma} \cdot E_{j}$$
⁽⁴⁾

Where Pj stands for inward multilateral resistance, which represents the set of barriers that hinder a country's imports from another, and Π i stands for the outward multilateral resistance terms, measuring the barriers that hinder all exports of a given country in all target markets. Further, Fally (2015, 6) developed a property which ensures a match between the structural gravity terms of the importer-year and exporter-year FEs, δ_{it} and η_{jt} respectively:

$$\exp(\hat{\delta}_{it}) = \frac{Y_{it}}{\hat{\Pi}_{it}^{1-\sigma}} \cdot E_{it}$$
⁽⁵⁾

$$\exp(\hat{\eta}_{jt}) = \frac{E_{jt}}{\widehat{P}\frac{1-\sigma}{jt}} \cdot \frac{1}{E_{jt}}$$
⁽⁶⁾

Where, as Yotov et al. (2016, p. 95) explain, $\hat{\delta}$ and $\hat{\eta}$ are the estimates of the directional fixed effects from equation (2), Yit and Ejt are the values of output and expenditure in year t, and are the MRTs, Eit is the expenditure of country i in year t, and Ejt is the expenditure of country j in year t. Thus, this paper controls for country-year-specific shocks and for the MRTs by means of importer-year and exporter-year FEs. Moreover, as it is standard in the literature, the model used in this paper also accounts for pair fixed effects (µij), to tackle endogeneity issues of BIT and TIP dummy variables and to control for all possible time-invariant trade costs at the bilateral level that could determine both trade intensity and the probability of two countries of signing either a BIT or a TIP (Mattoo, Mulabdic, & Ruta, 2022, p. 1615). Thus, this paper controls for country-pair time-invariant factors, such as distance, contiguity, common language, and colonial ties, by means of reporter-partner FEs.

In addition, given that the gravity model used was estimated with panel data across sectors, the exporter and importer FEs to account for the MRTs also vary by industry. The underlying reason is explained by the fact that "aggregate estimation of models with heterogeneous multiplicative two-way fixed effects leads to biased parameter estimates and misleading predictions"

(French, 2017, p. 40) and thus, (i) adding the sector FE (λ s), and (ii) using the most disaggregated data available, are the manners to avoid regression bias (French, 2017, p. 40). Therefore, the gravity model estimators need to control for exporter-sector and importer-sector FEs under the parameter λ s.

The gravity model fits services trade "in a similar manner to [trade in] goods" (Walsh, 2006, p. 1), and thus some researchers extended the gravity model to analyse trade in services (Ceglowski, 2006; Kimura & Lee, 2006; Fraser, 2021; Capoani, 2023). The

wealth of countries (GDPi and GDPj) and a shared language (LANGij) are the primary determinants of services trade (Walsh, 2006, p. 1). Dummies for common language or other relevant cultural features, such as colonial history (COL45ij), are used to capture information costs (Bacchetta et al., 2012, p. 106), as trade may be easier due to a more similar environment compared to others. Moreover, apart from the distance between the exporter and the partner (DISTij) (McCallum, 1995; Anderson & van Wincoop, 2003), the contiguity effect (CONTIGij) is the most often estimated coefficient in empirical gravity (Head & Mayer, 2014). The application of the gravity model to services trade can be done using a flexible empirical form consistent with the gravity equation theory together with the panel data.

This paper employs four types of fixed effects. Firstly, following the approach proposed by Olivero and Yotov (2012), exporter-

year (δ it) and importer-year (η jt) FEs are used to address time-varying country effects. By merging country and year indicators, they mitigate the potential biases arising from unobservable linkages between endogenous trade policy covariates and the error term (Yotov et al., 2016, p. 79). Additionally, they capture all time-varying attributes specific to each country, both as an importer and as an exporter, separately. Secondly, in line with prior research, pair country FEs (μ ij) are employed to control for unobservable time-invariant covariates (Agnosteva, Anderson, & Yotov, 2014) and trade cost components (Yotov et al., 2016, p. 21). Because of perfect collinearity, using pair fixed effects does not allow to include in the model, and therefore estimate, any

of the variables that do not vary over time, namely GDPi, GDPj, LANGij, DISTij, CONTIGij, and COL45ij. Thirdly, industry FEs (λ s) are introduced to address aggregation bias, as recommended by French (2017, p. 17), and serve to account for unobserved, time-invariant factors specific to each sector that may influence trade outcomes.

For long, the gravity model was modelled with log-linearised Ordinary Least of Squares (OLS) equations (Gil-Pareja, Llorca, & Martínez-Serrano, 2008; Dutt, Santacreu, & Traça, 2022). Nevertheless, this technique suffered from two major issues, which have been neglected in many econometric applications: first, the zero bilateral trade values were not accounted for, and second, it presents heteroskedasticity in the error terms, which in turn gives biased estimates. It was not until Santos Silva and Tenreyro (2006) introduced Poisson Pseudo Maximum Likelihood (PPML) that the issue of zero trade values of bilateral trade and parameter inconsistency in the presence of heteroscedasticity was tackled, thus setting the way in which the gravity model is modelled nowadays. Currently, the PPML estimator is "the state-of-the-art estimator to obtain unbiased and theory-consistent estimates of the gravity equation" (Esteve-Pérez et al., 2020, p. 2576) and "extraordinarily well suited for the estimation of gravity equations" (Santos Silva & Tenreyro, 2022, p. 434). Unlike OLS, the estimation of gravity equations via PPML is "more robust to aggregation" (Breinlich, Novy, & Santos Silva, 2021, p. 2) thanks to the Poisson consistency in the presence of fixed effects (Shepherd, 2016). It provides an "accurate manner to deal with zero values on the dependent variable" (Correia, Guimarães, & Zylkin 2019, p. 95).

In this paper, PPML was used, however, accounting for the coding evolution of the gravity model. As suggested by Correia, Guimarães, & Zylkin (2019), PPML was coded through a Poisson pseudo-likelihood regression with multiple levels of fixed effects (PPMLHDFE), implementing the three multi-way fixed effects currently recommended in gravity literature and adding industry FEs when data was categorised by service trade sectors. Apart from facilitating the estimate of complex gravity equations using large data panels (Santos Silva & Tenreyro, 2022, p. 434), PPMLHDFE allows for correlated errors across countries and time (Larch et al., 2018). Thus, for the purpose of this research, standard errors have been clustered at a country-pair level. Hence, this paper builds on the structural PPML gravity equation, which is a perfect fit for observations where Xijt = 0, and estimates the effects on service trade using the recently developed code PPMLHDFE (Correia, Guimarães, & Zylkin, 2019). Accordingly, the model implements clustering at the country-pair level and at the industry level when segregated data is presented. In all, this paper estimates the effect of IIAs (separating TIPs from BITs) in services trade as follows:

$$TRADEEXP_{ijt} = \exp \left(\beta_0 + \beta_1 \cdot TIP_{ijt} + \beta_2 \cdot BIT_{ijt} + \beta_3 \cdot FTA_{ijt} + \beta_4 \cdot OECD_{ijt} + \beta_5 \cdot EU_{ijt} + \beta_6 \cdot asym_TIP_{ijt} + \beta_7 \cdot SPTA_{ijt} + \delta_{it} + \eta_{jt} + \mu_{ij} + \lambda_s\right) + \varepsilon_{ijt}$$
⁽⁷⁾

TRADEEXPijt indicates the bilateral service exports from countryi to countryj at time t. The description of the variables accompanying the estimates from β 1 to β 7 can be found in Annex 2. The terms δ_{it} , η_{jt} , μ_{ij} and λ s account for exporter-year, importer-year, country-pair and sector FEs, respectively. Last, ϵ_{ijt} accounts for the idiosyncratic error term. We apply the

same gravity model for all specifications, ensuring consistency across the subsequent analysis. The model is used to examine specific modes of service trade and is also applied individually to each sector, allowing for a detailed assessment of the impact in

different contexts. For simplicity, the previous different trade policy variables were grouped in the vector T_{ijt} and the associated parameters in the parameter vecto β as follows:

$$TRADEEXP_{ijt} = \exp((T_{ijt} \cdot \beta + \delta_{it} + \eta_{jt} + \mu_{ij} + \lambda_s) + \varepsilon_{ijt}$$

By providing a sectoral granulation of services, this paper empirically complements Xiong and Sun (2022), who assessed that BITs decrease service exports from developed to emerging economies by analysing a services trade dataset from 1995 to 2006 but aggregating all industries trade without providing a clear explanation of the phenomenon. First, this paper uses a longer period is used since previous research does not cover data after 2006. Second, the model used in this thesis notably adds gravity controls compared to the previous analysis. Third, the present paper draws significant conclusions thanks to the sectoral granulation of services trade and the application of sector-time fixed effects in the gravity model PPMLHDFE specification used.

2.2 Data Sources and Description

The analysis in this paper uses six main sources of data on (i) Treaties with Investment Provisions, (ii) in force and terminated Bilateral Investment Treaties, (iii) services trade, (iv) gravity model data, and control variables such as (v) the relationship between countries signing a TIP (vi) or the existence of an SPTA, using panel data to obtain the structural gravity estimates, as argued by Yotov et al. (2016, p. 23), given that the effect of trade policy changes on trade flow adjustment is not instantaneous. Each data source is described below.

First, the TIP dummy was created by extracting a TIP database from the **World Bank Group database** (Hofmann, Osnago, & Ruta, 2017). The database covers 400 agreements signed by 189 countries between 1958 and 2023, which reflects the entire set of Preferential Trade Agreements (PTAs) in force and notified to the WTO. A dummy variable was created for the purpose of the analysis, which is equal to unity if there was a TIP in force between the two countries in the year in question and equal to 0 otherwise. All BITs in the database were used without being segregated by income level.

Second, the **UNCTAD database** is the source of BITs. Specifically, a dummy variable was created for the purpose of the analysis, which is equal to unity if there was a BIT in force between the two countries in the year in question and equal to 0 otherwise. For the study, only BITs in force and those that had been terminated were considered. Therefore, BITs that were under negotiation and those signed but not in force were not examined, since their effect on trade in services was not yet quantifiable. All BITs in the UNCTAD database were used without segregation by income level; therefore, BITs between low, lower-middle, upper-middle, and high-income countries were used interchangeably. For both TIPs and BITs, the time interval of the analysis is from 2005 to 2021 due to sporadic and unreliable information in the earlier years and incomplete data in the later years, as no services trade data were available before 2000 for most emerging economies. As van der Marel and Shepherd (2003, p. 1394) mention, "the availability of services trade data remains a major constraint for researchers." Moreover, post-2005 BITs consider novel features implemented after 2005 in many of the signed treaties.

Third, this research primarily collects services trade data from the **BaTiS database**, which provides a segregation of services trade by sector. For this purpose, the modes of supply 1, 2, and 4 were analysed together, given that the database reports data from the Balance of Payments, which omits trade through mode 3, given that it remains largely unreported. Moreover, service data from the **TiVA database** was also used to examine the consistency of results across the cross-border mode of service provision, more details of which are provided in the robustness checks section. In this regard, the WTO TiSMoS database provides estimates of trade in services broken down by the four modes of supply, including mode 3, depicting a more comprehensive picture of global trade in services (Kang et al., 2022, p. 27). However, the TiSMoS database was rejected for the purpose of this study, given that the data came with big gaps for countries of different income types.

(8)

Fourth, this paper uses the gravity dataset from the **CEPII**, which provides all the information required to estimate gravity equations and "was used in 650 research projects" by 2018 (Gurevich & Herman, 2018, p. 3). However, as mentioned above, trade flows have been selected from the BaTiS database for the purposes of sectoral analysis and precision. In addition, the OECD and EU variables provided by the CEPII database have been discarded, thus eliminating eu_o, eu_d, oecd_o and oecd_d from the dataset. The intrinsic reason is that to analyse the effects by type of country, this paper needed a dummy variable that considered membership in the EU or OECD, respectively. This variable also had to consider the year in which the country joined the respective organisation and had to vary per year, considering, were applicable, the year in which the country left the organisation, which was not the case in the CEPII dataset. Therefore, a new dataset was created considering two different dummy variables, EU and OECD, which were finally merged with the other files described in this section.

Fifth, this paper also gathered data from the World Bank country classifications by income level (World Bank, 2024) to create the asym_TIPijt dummy. The variable equals unity if either the exporter or the partner country is classified as a lower-middle-income country while the other country is classified as a high-income country, or vice versa; it equals 0 otherwise. Given that emerging and developed countries are driven by different objectives when signing IIAs, it would be expected that the ratification of an IIA may lead to a positive services trade effect.

Sixth, this research also gathered data from the United States International Trade Commission (USTIC) from the International Trade and Production Database for Estimation (ITPD-E). Specifically, the Services Preferential Trade Agreement (SPTAijt) control variable was extracted from this dataset. A detailed specification of the sources for these variables can be found in Table 1, and a summary of the statistics is described in Table 2. As a side note, the use of the **USTIC-ITPD-E database** is recommended as the gravity dataset to run the gravity model, given that only reported trade flows are covered, also including data on domestic trade, whereas in the BaTiS dataset, both reported and estimated trade flows are treated. However, due to notable gaps in the USTIC-ITPD-E database and the considerable time required to operate the system, it was excluded as a source of gravity data for both the general regression and the robustness checks.

In terms of **data aggregation**, this paper finds it advantageous to analyse trade data from the BaTiS database, which serves as a "comprehensive tool for economic analysis and policymaking" (Liberatore & Wettstein, 2021, p. 3). Firstly, as "gravity estimations have traditionally mostly relied on aggregate data" (Yotov et al., 2016, p. 32), this paper first examines the effect of both TIPs and BITs on goods and services trade on an aggregate basis. Secondly, it examines only the effect of aggregate merchandise trade. Thirdly, the paper examines the effect of both TIPs and BITs on services trade on an aggregate basis, combining modes 1, 2, and 4 trade data summed over sectors. Last, following the significant negative effect found on aggregate services trade and in order to disentangle its effects, this paper presents a detailed analysis per sector, relying on both BaTiS and TiVA datasets as service trade databases.

Finally, this paper merges the aforementioned datasets to obtain a consistent and comprehensive bilateral panel dataset for gravity model estimations by means of PPMHLDFE coding. As previously mentioned and illustrated in Table 7, specific variables such as OECDijt, EUijt or asym_TIPijt were created for the purpose of the research due to inconsistencies in the variables proposed by the CEPII gravity database. Moreover, variables such as SPTAijt or asym_TIPijt were specifically created for the purpose of this paper to control for the results. A detailed analysis of the regression results on both an aggregate level and a sectorial level can be found in the following section.

3. Results and Discussion

First, as a benchmark, columns (1) to (4) in Table 1 present the impact of IIAs, as a proxy for commercial presence, on aggregate service trade exports for all countries when using the BaTiS dataset as service trade dataset, while columns (5) to (8) use the TiVA dataset. It is important to note that the BaTiS dataset includes data from modes 1, 2, and 4, whereas the TiVA dataset also accounts for mode 3. The effect of IIAs is captured through the TIP and BIT dummies to analyse which type of agreement has the strongest impact while controlling for FTAs, OECD and EU membership, PTA ratification and whether the countries signing the TIP belong to the same World Bank income group. Columns (1), (2), (5), and (6) present the data in aggregate terms, estimating the gravity model with three-way fixed effects based on equation (8), while the remaining columns present more observations, as the processed data account for different commercial industries, so four types of fixed effects are implemented.

The results found when using the BaTiS database and all sectors' data, which can be found in column (3) in Table 1, imply that BITs have a significant negative effect on modes 1, 2, and 4 of service exports when controlling for sectorial fixed effects. These findings complement previous research on the effects of BITs on services trade flows (Xiong & Sun, 2022), empirically confirming that BITs decrease service exports from developed to emerging economies through analysing WTO-OECD Balance Trade in Services Data from 1995 to 2006. However, column (7) in Table 1 shows the results found when using the TiVA database, which includes data on mode 3, and points to a different effect due to the latter. They imply that BITs have a significant positive effect on service exports when controlling for sectorial fixed effects, which we attribute to the catalyst role that IIAs have on commercial presence. The positive correlation that BITs show on mode 3 of supply is such that it is able to compensate for the negative effect of the other modes of supply, leading to a complementarity effect between BITs and aggregate services trade exports. All in all, this paper finds empirical evidence to confirm the **substitutability effect between BITs and mode 1 of supply**.

The results from columns (1) to (8) in Table 1, based on both the BaTiS and TiVA datasets, indicate that EU membership has a strong and significant positive effect on service exports between the exporter and partner countries. These results may indicate the effectiveness of the Single Market and the Schengen Area in liberalising the four freedoms. Moreover, the results from columns (1), (3), (6), and (8) shed light on the mechanisms through which international agreements influence trade, showing that the positive impact of the ratification of an FTA outweighs the negative impact of signing a TIP among the signatory countries. Hence, an FTA may stimulate trade in services, though less when investment clauses are included in the agreement. The stronger results with TiVA may indicate that mode 3 has a great impact on driving this effect. These findings suggest that deeper economic integration agreements, such as the EU and FTAs, play a crucial role in facilitating service trade.

Regarding the effect of a TIP ratified between countries of different income classifications, the results suggest a clear pattern. When estimating the model using both the BaTiS and TiVA datasets, the dummy indicating an asymmetric relationship between exporter and reporter countries signing a TIP is significantly positive, as columns (1), (2), (5) and (6) in Table 1 show. The results imply that TIPs increase aggregate service exports among economies with different income classifications by about 11,69% on average.¹ Therefore, these results suggest that, in agreements between countries at different stages of development, the ratification of a TIP may lead to a positive services trade effect. Emerging and developed countries are driven by different objectives when signing TIPs. This aligns with the expectation that vertical integration, the [upstream or downstream] expansion of a firm over its generic activities on the value chain from raw materials to the consumer (Midttun, 2001), may predominate in such agreements.

The intrinsic reasoning may lay in the expected differences in factor cost and scale economies in the different income level countries (Lee, 2002, p. 13), as most benefits from services liberalisation of developing countries derive not from seeking better market access, but "from the increased competitiveness and efficiency of the domestic market" (Nielson & Taglioni, 2004, p. 12). For example, Xiong and Sun (2022) mentioned that the barriers to service trade in developed countries are lower, such as in terms of better transport or postal infrastructure. Indeed, when looking at the industries where the synergies are present, transport (SC) or travel (SD) could be highlighted (see Table 4). Moreover, developed countries have a comparative advantage in data-intensive industries, such as some service sectors (International Monetary Fund, 2001), which may increase developing countries' will to access these markets.

A key example may be the relationship between the EU and China, where the asymmetrical nature of the partnership fosters vertical integration but to the detriment of the EU's own value chain (Garcia-Herrero et al., 2020, p. 16) or the financial services outsourcing from the United States to India (Greene, 2006, p. 5). In this line, TIPs signed between countries of different income classifications may enable firms in developed countries to leverage cost advantages and access new markets in developing economies. These findings reinforce the notion that deeper economic integration through TIPs fosters trade expansion through vertical integration when sufficient structural complementarity exists between the signatory countries. However, this is not the case in agreements between similarly developing or developed economies, with the exception of the EU, as previously argued.

The results from columns (1) to (8) in Table 1, based on both the BaTiS and TiVA datasets, indicate that ratifying a services PTA among countries does not significantly affect service exports between the exporter and partner countries. This effect may be attributed to the fact that, for most countries, "PTA trade exceeds services under the most favoured nation (MFN) terms"

¹ The percentage change effect of the dependent variable in response to the TIP dummy variable was approximated by calculating the average negative effect of regression outputs in Table 1, after using the formulation $100^{*}(e^{\beta_{1}} - 1)$ over all β_{1} coefficients.

(Borchert & Ubaldo, 2021, p. 4). Even more, some authors have argued that agreements in the realm of services do not entail actual service liberalisation if compared to applied services trade policies (Miroudot & Pertel, 2015; Borchert, 2011). These results are consistent with previous findings claiming that substantial trade-enhancing "only emanate(s) from deep trade agreements" (Borchert & Ubaldo, 2021, p. 7), such as EU or OECD membership, as mentioned before.

The results from columns (1) to (4) in Table 1, using the BaTiS dataset, indicate that TIPs have a negative significant effect on modes 1, 2, and 4 of supply. This may reveal a possible substitution effect between the ratification of an agreement with investment provisions and services trade. Given that TIPs were used as a proxy for mode 3 of supply, this may indicate a substitution effect between commercial presence and mode 1, 2, or 4 of trade-in services. Despite the evident substitution effect, the results do not provide a clear answer as to which mode of supply is most responsible for this shift. Furthermore, the analysis does not pinpoint the specific service sectors that are most susceptible to the effects of TIPs, an issue that will be further developed hereafter by segregating by industry type.

The results from columns (5) to (8) in Table 1, using the TiVA dataset, indicate that the negative relationship between TIPs and services trade is neither consistent nor statistically significant. This may support the substitution effect for two key reasons. First, the TiVA dataset includes data on mode 3 of supply, which likely dilutes the overall effect by aggregating all service sectors rather than isolating specific modes. Second, TiVA reports fewer data on mode 1 flows than the BaTiS dataset, which could play a major role in driving the substitution effect. These two factors may weaken the observed negative impact of TIPs ratification on total services trade, explaining why regressions using the TiVA dataset yield insignificant results.

To identify which mode of supply primarily drives the substitution effect, columns (1) to (4) in Table 2 estimate a gravity model that disaggregates services trade into four industry types, incorporating four types of fixed effects based on Equation (8). The results suggest that BITs have a significant positive effect on goods-related services (SPX4, as shown in Table 3), aligning with previous research on goods trade (see Annex 3). Conversely, TIPs exhibit a significant negative effect on "commercial services" (SOX, as defined in Table 2, from S to SL). This indicates that commercial presence substitutes for other industries of services trade —but which one specifically?

As Fontagné and Pajot (2001, p. 240) note, at the aggregated level, a substantial part of the observed relationship can be attributed to spillovers between industries. To identify which type of industry drove the significant negative effect of TIPs and BITs on services trade, Table 4 reports the estimates of a gravity model that disaggregates SOX sectors using the BaTiS dataset. In other words, it provides gravity estimates for industries from SA to SL without including industry-fixed effects (λ s). The results suggest that the sectors driving the significant negative effect of TIPs on services trade are (1) transport (SC), (2) construction (SE), (3) insurance and pension services (SF), (4) charges for the use of intellectual property (SH), and (5) personal, cultural, and recreational services (SK). For BITs, the results suggest that the industries experiencing a decrease in exports following their signature are (1) transport (SC), (2) charges for the use of intellectual property (SH), and (3) telecommunications, computer, and information services (SI). Notably, as shown in Annex 3, which presents the default allocation of EBOPS items to modes of supply, these sectors are primarily supplied cross-border. As Figure 5 shows, over time, these sectors are "moving towards cross-border trade" (Andrenelli, 2018, p. 20).

Concretely, the transport sector is 90% associated with mode 1 of supply and 10% with mode 2 (see Annex 3). The insurance and pension services sector, as well as the sector of charges for the use of intellectual property, are both entirely supplied cross-border. Additionally, personal, cultural, and recreational services are 75% associated with mode 1, with the remaining 25% linked to mode 4. Last, telecommunications, computer and information services are 80% associated with mode 1 of supply, at 20% with mode 4, being that telecommunication and information services are entirely supplied cross-border. The EBOPS classification suggests that cross-border services trade may be the primary mode driving the negative effect observed in the regression between BITs and TIPs, and service exports. Notably, four of the sectors contributing to the negative impact of IIAs on services trade are digitally deliverable: (1) insurance and pension services, (2) charges for the use of intellectual property, (3) personal, cultural, and recreational services, and (4) telecommunications, computer and information services. Furthermore, the last three are both software-intensive services that require prior data investment to be conducted.

Therefore, this paper empirically demonstrates that IIAs are a substitute for cross-border trade. Several factors may explain this effect, some of which are outlined below, while others remain beyond the scope of this discussion. First, mode 3 restrictions,

which are mainly barriers related to foreign operations of firms, have a "positive impact on cross-border trade" (Khachaturian & Oliver, 2021, p. 34). Consequently, firms facing constraints in establishing a physical presence abroad may opt to provide crossborder services instead. While this paper does not directly examine the effect of trade barriers, future research could explore this relationship. Second, technological advancements have enabled many firms to deliver services through mode 1 efficiently, reducing the need to establish a physical presence abroad. Third, the substitution effect appears more pronounced between countries of different income levels. If investment is perceived as risky due to political instability or weak legal protections, firms may choose to refrain from FDI and expand their cross-border service offerings instead.

In light of the substitution effect, firms often have to decide whether to establish a subsidiary in a foreign country or provide cross-border services, with the general tendency being to choose one mode of supply over the other. If the substitution effect found is confirmed between these modes of services trade, it could not only explain the strategic decisions observed in business practices over the last three decades but also have implications for future decisions regarding international business expansion. Companies are constantly assessing the most cost-effective and efficient ways to engage with foreign markets, and the ratification of an IIA never left them indifferent; indeed, it could have a direct influence on their operations.

On the one hand, from 2005 to 2018, the trend to operate services trade clearly favoured mode 3 of supply (see Graph 3), which indicated that companies preferred establishing a physical presence in a foreign country. This approach allowed companies to access local markets more effectively, managing operations directly and gaining greater control over their supply chains. It can be inferred that if a new IIA were ratified, service suppliers could shift from providing services through cross-border mechanisms to providing them through commercial presence, as could have been the case with industries such as finance, telecommunications or insurance activities.

On the other hand, this trend could be reversed in the not-too-distant future, as mode 1 services are progressively gaining ground, which involves providing services without requiring a physical presence. This shift could eventually be attributed to technological advancements, such as improved digital infrastructure or the shift to data liberalisation paradigms. The trend is especially evident in industries like intellectual property or personal, cultural, and recreational services, where businesses are increasingly implementing digital platforms to deliver services, which offer more flexibility and imply fewer costs than mode 3 of supply.

Overall, this substitution effect may have implications for corporate strategy in the coming years. The rise of cross-border services could lead to rethinking business models, particularly in sectors traditionally dominated by commercial presence. Companies may opt to invest more in digital transformation and online services rather than expanding their physical establishment, even making the need for companies' commercial presence obsolete. As services can increasingly be provided at the click of a mouse without needing physical presence, the trend could see a rapid rise in the coming years.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	EXP	EXP	EXP	EXP	EXP	EXP	EXP	EXP
Trade dataset	BaTiS	BaTiS	BaTiS	BaTiS	TiVA	TiVA	TiVA	TiVA
TIP	-0.0374**	- 0.0377**	-0.0470**	0.0476**	-0.0105	-0.0090	-0.00112	-0.0004
BIT	-0.0462	NA	-0.0884**	NA	0.0691*	NA	0.0879***	NA
FTA	0.0564*	0.0378	0.0788**	0.0434	0.0372	0.0768***	-0.0056	0.0450***
OECD	-0.0242	-0.0239	-0.0219	-0.0213	0.0220	0.0212	0.0133	0.0122
EU	0.1393***	0.1395***	0.1708***	0.171***	0.1298***	0.1296***	0.1810***	0.1808***
asym_TIP	0.1106**	0.1094**	0.0326	0.0301	0.0766*	0.0784*	-0.022	-0.0198
PTA services	0.0028	0.0029	0.006	0.006	0.0217	0.0215	0.0283	0.0280
FE exp-year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE imp-year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE pair	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE sector	No	No	Yes	Yes	No	No	Yes	Yes
Countries	All	All	All	All	All	All	All	All
Obs.	426,516	426,516	4,371,201	4,371,201	1,188,582	1,188,582	1,026,983	1,026,983

Table 1. Gravity model regression with CEPII as gravity dataset**Source:** authors' elaboration.

	(1)	(2)	(3)	(4)
	EXP	EXP	EXP	EXP
Industry	SOX	SOX1	SPX1	SPX4
TIP	-0.0381**	-0.0400	-0.0354	0.0991
BIT	-0.0563	-0.0467	-0.0094	0.318**
FTA	0.0704**	-0.0706	0.0226	0.108
OECD	-0.0165	-0.0154	-0.0318	-0.392***
EU	0.1405***	0.134**	0.1456***	0.4242**
asym_TIP	0.1099**	0.0109	0.0123	-0.1674*
PTA services	0.005	0.0249	0.0137	-0.2179**
FE exp-year	Yes	Yes	Yes	Yes
FE imp-year	Yes	Yes	Yes	Yes
FE pair	Yes	Yes	Yes	Yes
FE sector	No	No	No	No
Countries	All	All	All	All
Obs.	426,124	425,622	425,655	333,570

Table 2. Gravity model regression per type of industry using BaTiS dataset for service trade data and CEPII as gravity dataset

 Source: authors' elaboration.

*** significant at 1 %, ** significant at 5 %, * significant at 10%

Code	Industry	Code	Industry
S	Total Services	SI	Telecommunications, computer, and information services
SA	Manufacturing services on physical inputs owned by others	SJ	Other business services
SB	Maintenance and repair services n.i.e.	SK	Personal, cultural, and recreational services
SC	Transport	SL	Government goods and services n.i.e.
SD	Travel	SOX	Commercial services (from S to SL)
SE	Construction	SOX1	Other commercial services (form SE to SK)
SF	Insurance and pension services	SPX1	Other services (from SE to SL)
SG	Financial services	SPX4	Goods-related services (SA and SB)
SH	Charges for the use of intellectual property n.i.e.		-

 Table 3. BaTiS Service Trade Industry Code

Source: authors' elaboration.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Sector	SA	SB	SC	SD	SE	SF	SG	SH	SI	SJ	SK	SL
Trade dataset	BaTiS	BaTiS	BaTiS	BaTiS	BaTiS	BaTiS	BaTiS	BaTiS	BaTiS	BaTiS	BaTiS	BaTiS
TIP1	0.045	0.010	-0.091***	-0.025	-0.123***	-0.114*	-0.048	-0.149**	-0.063	0.012	-0.096*	-0.048
BIT	0.586**	0.320	-0.105*	-0.062	0.190*	-0.069	-0.129	-0.464***	-0.263***	-0.072	-0.166	0.256***
FTA	-0.312	0.156	0.123**	0.041	-0.130**	0.224***	0.193***	0.339***	0.075	0.083	0.011	-0.278***
OECD	-0.246	-0.448**	-0.004	0.002	0.472***	0.082	-0.186	-0.209*	-0.015	-0.085*	0.290*	-0.199**
EU	0.641***	-0.315*	0.233***	0.113*	0.581***	0.351***	0.082	-0.068	0.027	0.114	0.363***	0.171*
asym_TIP	-0.285**	0.215*	0.112*	0.073**	0.006	-0.415***	-0.117	0.166	0.035	0.003	0.345**	-0.004
PTA	-0.242*	-0.030	0.034	-0.003	0.063	0.061	0.040	0.098	-0.015	-0.021	0.138**	0.017
FE exp-year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE imp-year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE pair	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE sector	No	No	No	No	No	No	No	No	No	No	No	No
Countries	All	All	All	All	All	All	All	All	All	All	All	All
Obs.	177,004	320,923	425,851	425,894	339,318	395,164	385,163	328,116	415,062	423,878	340.304	394,524

Table 4. Gravity model regression with BaTiS for trade data and CEPII for gravity**Source:** authors' elaboration.

Notes: See Figure 2 for a graphical representation of the coefficients



Figure 2. Regression coefficients on TIPs value with BaTiS for trade data and CEPII for gravity data by sector **Source:** authors' elaboration.

Note: The coefficients reported in this figure correspond to the regression specification presented in Table 4. For industry codes see Table 3.

4. Concluding Remarks

As previous research has shown, the future of globalisation is not goods but services (Lund et al., 2019; Baldwin, 2022; WTO & World Bank, 2023). This paper examines the **effect of IIAs** on a bilateral panel dataset of service trade segregated by sectors, using the recently developed PPMLHDFE estimation regression model with four types of high-dimensional fixed effects (exporter-year, importer-year, country-pair fixed effects, and industry fixed effects) to estimate the structural gravity equations. Drawing on the BaTiS trade database from 2005 to 2021 alongside TIPs and BITs databases specifically constructed for this study from Hofmann and UNCTAD databases, respectively, this paper demonstrates, through gravity model estimations, that IIAs reduce cross-border service trade. Given that foreign affiliate sales follow IIAs, this paper claims substitutability between mode 1 and mode 3. Research estimates that IIAs have been for long encouraging service suppliers to opt for commercial presence. However, this trend may gradually begin to reverse, a phenomenon especially noticeable between countries with different World Bank income classifications.

The empirically proved substitution effect between commercial presence and cross-border services mode of supply confirms evidence that international trade is transforming and "telemigrating" (Baldwin, 2019). Interestingly, since the so-called "re-orientation era", from 2008 onwards, when governments entered a phase of evaluating the costs and benefits of IIAs and reflecting on their future objectives and strategies as regards these treaties (UNCTAD, 2005, p. 124), mode 1 trade in services picked up. Several countries have embarked on a path of IIA reform by revising their agreement model, with a view to concluding a "new generation" of IIAs (UNCTAD, 2005, p. 124). Substitutability may be explained by various factors including, but not limited to, mode 3 restrictions, technology advancement, and investment ease. In turn, the stronger negative, and consequently, the greater substitutability effect, among countries of different income levels could be attributed to developed markets' enhanced competitiveness and efficiency.

While IIAs, particularly Bilateral Investment Treaties (BITs), as pure investment treaties, have successfully facilitated investment and commercial presence over the years, their effectiveness in promoting cross-border trade in services remains limited. This aligns with previous findings in the literature (Khachaturian & Oliver, 2023; Xiong & Sun, 2022), which suggest that bilateral agreements have not significantly contributed to the expansion of cross-border service sectors. Policymakers could consider two key policy options to effectively stimulate cross-border trade in services.

On the one hand, at the national level, given that barriers to trade in services are "higher than for trade in goods" (WTO & World Bank, 2023, p. 55), if policymakers wanted to boost mode one of supply, given the data intensity feature of cross-border industries, they should consider further liberalisation of their regulatory models of cross-border data flows.² For example, removing restrictions related to data governance, such as data localisation requirements, which impact Internet communication services, e-commerce, and the Internet of Things (IoT) (USITC, 2017). Additionally, they might reassess cybersecurity regulations, including requirements to disclose source codes, encryption restrictions, censorship policies, and Intellectual Property Rights (IPR) measures like ancillary copyrights.

On the other hand, at the multilateral level, given that market access commitments are "more limited than for trade in goods" (WTO, 2023, p. 51), it is recommended that policymakers consider incorporating liberalisation provisions in trade agreements that address the three main drivers of demand for services trade: technological change, the reduction of trade barriers, and the enhancement of connectivity. In this line, they should prioritise reviewing and adjusting existing agreements rather than promoting the signing and ratifying of new IIAs. National and multilateral approaches are not mutually exclusive; rather, they can reinforce one another, creating a feedback loop that fosters data liberalisation and facilitates the expansion of cross-border services trade under mode 1. However, it is important to acknowledge that implementing such policies could come at the expense of foreign sales affiliates, potentially reshaping the balance between digital trade and commercial presence.

This shift could majorly impact corporate strategy in the coming years. Due to the substitutability effect, the expansion of crossborder services may lead businesses to reconsider their traditional models, particularly in industries that have historically depended on a physical presence. Instead of investing in new offices or branches, companies might focus more on digital tools

² The World Development Report (2021, 241) divides the uptake of regulatory models to cross-border data flows into (a) open, such as the US federal rules, (b) conditional, such as the European Union General Data Protection Regulation, and (c) limited, such as China's Cybersecurity Law, or the Russian Federation's personal data processing.

and online services. In some cases, having a physical presence may no longer be necessary, which may involve the relocation of companies in some countries. Since many services can now be delivered instantly with just a click, this trend will likely accelerate, changing how businesses compete, invest, and operate globally.

However, it is crucial to recognise that, with the geopolitical landscape in the first quarter of the 21st century, the transition toward more liberalised models is not being incentivised, given the rising tide of protectionist movements and economic security and trade defence measures. Some major actors, such as the European Union, increasingly seek to distance themselves from multilateralism, while others continue to advocate for market diversification and data liberalisation. A clear pioneering example of this commitment was the EU-Singapore Digital Trade Agreement, which positioned both parties "at the global forefront of digital policy development while upholding open [and fair] digital economies" (EEAS, 2024). In addition, following the ratification of Free Trade Agreements (FTAs) with investment-related provisions, such as those recently included in the agreements concluded with Mercosur and Mexico (European Commission, 2024), and others currently in the pipeline, such as the EU-Indonesia and EU-India trade agreements, the EU's commitment to these principles remains clear.

The future of trade will increasingly be centred on services (WTO & World Bank, 2023, p. 13), highlighting the need for further research. Subsequent studies should aim to determine the direct correlation between cross-border service trade and establishing a commercial presence by a service supplier of one country in the territory of another. In addition, it would be interesting to look at how the substitutability relationship evolves over time with future shifting business practices driven by technological change. Regarding policy implications, subsequent studies should aim to research whether countries have changed their data regulatory models and whether this impacted their services exports and imports shares. Moreover, future empirical studies could delve deeper into the underlying reasons for substitutability as additional detailed datasets become available. Finally, while it is essential to recognise the inherent characteristics of services, such as their intangibility, simultaneous provision and consumption, real-time delivery, and non-standardisation, these features should not diminish their study. Instead, they should serve as motivation for further exploration and empirical research.

5. Bibliography

Agnosteva, D. E., Anderson, J. E., & Yotov, Y. V. (2014). Intra-national trade costs: Measurement and aggregation (NBER Working Paper No. 19872). National Bureau of Economic Research. http://www.nber.org/papers/w19872

Aisbett, E. (2007). Bilateral investment treaties and foreign direct investment: Correlation versus causation. University Library of Munich.

Allee, T., & Peinhardt, C. (2011). Contingent credibility: The impact of investment treaty violations on foreign direct investment. International Organization, 65(3), 401-432. https://www.jstor.org/stable/23016160

Anderson, J. E. (1979). A theoretical foundation for the gravity equation. The American Economic Review, 69(1), 106–116. https://www.jstor.org/stable/1802501

Anderson, J. E. (2011). The gravity model. Annual Review of Economics, 3, 133-160. https://doi.org/10.1146/annurev-economics-111809-125114

Anderson, J. E., & van Wincoop, E. (2003). Gravity with gravitas: A solution to the border puzzle. American Economic Review, 93(1), 170–192. https://www.aeaweb. org/articles?id=10.1257/000282803321455214

Anderson, J. E., Borchert, I., Mattoo, A., & Yotov, Y. V. (2018). Dark costs, missing data: Shedding some light on services trade. European Economic Review, 105, 193–214.

Andrenelli, A., Cadestin, C., De Backer, K., Miroudot, S., Rigo, D., & Ye, M. (2018). Multinational production and trade in services (OECD Trade Policy Paper No. 212). OECD. http://dx.doi.org/10.1787/16ec6b55-en

Antimiani, A., & Cernat, L. (2018). Liberalizing global trade in Mode 5 services: How much is it worth? Journal of World Trade, 52(1), 65-83.

Antràs, P. (2024). De-globalisation? Global value chains in the post-COVID-19 age. National Bureau of Economic Research Working Papers. https://www.nber.org/ papers/w2811

Ariu, A., Breinlich, H., Corcos, G., & Mion, G. (2019). The interconnections between services and goods trade at the firm level. Journal of International Economics, 116(1), 173–188. https://www.sciencedirect.com/science/article/pii/S0022199618304343

Bacchetta, M., Beverelli, C., Cadot, O., Fugazza, M., Grether, J.-M., Helble, M., Nicita, A., & Piermartini, R. (2012). A practical guide to trade policy analysis.

Bae, C., Cho, M. H., Lee, K. Y., Kang, J., & Kim, J. (2021). The impact of unilateral trade policy on international trade structure. World Economy Brief, 11(41), 21–41. http://dx.doi.org/10.2139/ssrn.3936247

Baldwin, R. (2009). The great trade collapse: Causes, consequences and prospects. Centre for Economic Policy Research (CEPR).

Baldwin, R. (2011). 21st century regionalism: Filling the gap between 21st century trade and 20th century trade rules. World Trade Organization.

Baldwin, R., & Martin, P. (2024). Two waves of globalisation: Superficial similarities, fundamental differences (NBER Working Paper No. 6904). National Bureau of Economic Research. https://www.nber.org/papers/w6904

Baldwin, R., Freeman, R., & Theodorakopoulos, A. (2024). Deconstructing deglobalization: The future of trade is in intermediate services. Asian Economic Policy Review, 19(1), 18–37.

Benz, S. (2017a). Services trade costs: Tariff equivalents of services trade restrictions using gravity estimation. OECD Trade Policy Papers, 1(139), 3–53.

Benz, S. (2017b). Services trade costs: Tariff equivalents of services trade restrictions using gravity estimation. OECD Publishing, 1(200), 3–53. https://www.oecdilibrary.org/trade/services-trade-costs_dc607ce6-en

Berger, A., Busse, M., Nunnenkamp, P., & Roy, M. (2011). More stringent BITs, less ambiguous effects on FDI? Not a bit! Economics Letters, 112(3), 270–272. https://www.sciencedirect.com/science/article/pii/S0165176511002035

Berger, A., Busse, M., Nunnenkamp, P., & Royd, M. (2009). Do trade and investment agreements lead to more FDI? Accounting for key provisions inside the black box. World Trade Organization ERSD-2010-13.

Bergstrand, J. H. (1985). The gravity equation in international trade: Some microeconomic foundations and empirical evidence. The Review of Economics and Statistics, 67(3), 474–481. https://www.jstor.org/stable/1925976

Bergstrand, J. H. (1989). The generalized gravity equation, monopolistic competition, and the factor-proportions theory in international trade. The Review of Economics and Statistics, 71(1), 143–153. https://www.jstor.org/stable/1928061

Bergstrand, J. H. (1990). The Heckscher-Ohlin-Samuelson model, the Linder hypothesis and the determinants of bilateral intra-industry trade. The Economic Journal, 100(403), 1216–1229. https://academic.oup.com/ej/article-abstract/100/403/1216/5188485

Berlingieri, G. (2014). Outsourcing and the rise in services. Centre for Economic and Policy Research (CEPR).

Blonigen, B., & Piger, J. (2014). Determinants of foreign direct investment. Canadian Journal of Economics, 47(3), 775–812. https://econpapers.repec.org/article/ cjeissued/v_3a47_3ay_3a2014_3ai_3a3_3ap_3a775-812.htm

Bohn, T., Brakman, S., & Dietzenbacher, E. (2018). The role of services in globalization. The World Economy, 41(10), 2732–2749.

Borchert, I., & Mattoo, A. (2010). The crisis-resilience of services trade. The Service Industries Journal, 30(13), 2115-2136.

Borchert, I., Gootiiz, B., & Mattoo, A. (2014). Policy barriers to international trade in services: Evidence from a new database. The World Bank Economic Review, 28(1), 162–188. https://www.jstor.org/stable/43774130

Borchert, J. (2011). Individual ambition and institutional opportunity: A conceptual approach to political careers in multi-level systems. Regional & Federal Studies, 21(2), 117–140. https://doi.org/10.1080/13597566.2011.529757

Brada, J. C., Drabek, Z., & Iwasaki, I. (2021). Does investor protection increase foreign direct investment? A meta-analysis. Journal of Economic Surveys, 35(1), 34–70. https://doi.org/10.1111/joes.12392

Breinlich, H., & Criscuolo, C. (2011). International trade in services: A portrait of importers and exporters. Journal of International Economics, 84(2), 188–206.

Brinza, A., Berzina-Cerenkova, U. A., Le Corre, P., Seaman, J., Turcsanyi, R., & Vladisavljev, S. (2024). EU-China relations: De-risking or de-coupling—The future of the EU strategy towards China. European Parliament.

Buch, C. M., & Lipponer, A. (2004). FDI versus cross-border financial services: The globalisation of German banks. Deutsche Bundesbank.

Busse, M., Königer, J., & Nunnenkamp, P. (2010). FDI promotion through bilateral investment treaties: More than a BIT? Review of World Economics, 146(1), 147–177. http://www.jstor.org/stable/40587849

Büthe, T., & Milner, H. V. (2008). The politics of foreign direct investment into developing countries: Increasing FDI through international trade agreements? American Journal of Political Science, 52(4), 741–762. http://www.jstor.org/stable/25193847

Capoani, L. (2023). Review of the gravity model: Origins and critical analysis of its theoretical development. SN Business and Economics, 3(95), 1–43. https://doi. org/10.1007/s43546-023-00461-0

Ceglowski, J. (2006). Does gravity matter in a service economy? Review of World Economics, 142(2), 307-329. https://www.jstor.org/stable/40441094

Cernat, L. (2024b). What mode of supply will matter the most for the future of services trade? European Centre for International Political Economy.

Cernat, L. (2025). The 'hidden giant': How official statistics underestimate the true scale of global services trade. Centre for Economic Policy Research (CEPR). https://cepr.org/voxeu/columns/hidden-giant-how-official-statistics-underestimate-true-scale-global-services-trade

Cernat, L., & Kutlina-Dimitrova, Z. (2014). Thinking in a box: A 'Mode 5' approach to services trade. Journal of World Trade, 48(6), 1109–1126. https://doi. org/10.54648/trad2014039

Chanda, R. (2006). Inter-modal linkages in services trade (OECD Trade Policy Paper No. 30). OECD. http://dx.doi.org/10.1787/747731586224

Cingano, F., & Barone, G. (2011). Service regulation and growth: Evidence from OECD countries. Economic Journal, 121(555), 931-957.

Colen, L., & Swinnen, J. (2015). Economic growth, globalisation and beer consumption. Journal of Agricultural Economics, 67(1), 186–207. https://doi.org/10.1111/1477-9552.12128

Correia, S., Guimarães, P., & Zylkin, T. (2019). Fast Poisson estimation with high-dimensional fixed effects. The Stata Journal, 20(1), 95–115. https://doi.org/10.48550/ arXiv.1903.01690

Crawford, J.-A., & Kotschwar, B. (2018). Investment provisions in preferential trade agreements: Evolution and current trends. World Trade Organization.

Crozet, M., & Milet, E. (2015). Should everybody be in services? The effect of servitization on manufacturing firm performance. Journal of Economics & Management Strategy, 26(4), 820–841.

Crozet, M., & Milet, E. (2017). Should everybody be in services? The effect of servitization on manufacturing firm performance. Journal of Economics & Management Strategy, 26(4), 820–841. https://doi.org/10.1111/jems.12211

Cruz, M., & Nayyar, G. (n.d.). Manufacturing and development: What has changed? World Bank.

Dadush, U., & Sapir, A. (2021). Is the European Union's investment agreement with China underrated? Bruegel, 09(21), 2–14. https://www.bruegel.org/policy-brief/ european-unions-investment-agreement-china-underrated

Dutt, P., Santacreu, A. M., & Traça, D. A. (2022). The gravity of experience. INSEAD, 55(1), 213-248. https://doi.org/10.1111/caje.12583

Echandi, R., & Sauvé, P. (2020). Investment facilitation and mode 3 trade in services: Are current discussions addressing the key issues? World Bank Group Policy Research, 1(9229), 2–39. https://doi.org/10.1596/1813-9450-9229

Echandi, R., Bulatnikova, A., Jonetzko, G., & Qurashi, F. (2021). Services trade policy commitments: Inventory of non-conforming measures in bilateral investment treaties (BITs). World Bank Working Document, 1(1), 1–19. https://documents.worldbank.org/en/publication/documents-reports/documentdeta il/416131620365915686/reforming-services-trade-policies-for-development-services-trade-policy-commitments-inventory-of-non-conforming-measures-in-bilateral-investment-treaties-bits

Egger, P., & Merlo, V. (2007). The impact of bilateral investment treaties on FDI dynamics. The World Economy, 30(10), 1536–1549. https://doi.org/10.1111/j.1467-9701.2007.01063.x

Egger, P., & Pfaffermayr, M. (2004). The impact of bilateral investment treaties on foreign direct investment. Journal of Comparative Economics, 32(4), 788–804. https://econpapers.repec.org/article/eeejcecon/v_3a32_3ay_3a2004_3ai_3a4_3ap_3a788-804.htm

European Commission. (2024, April 16). What does "mode of supply" for services mean? Access2Markets. https://trade.ec.europa.eu/access-to-markets/en/faqs/ what-does-mode-supply-services-mean.

Eurostat. (2023). European business statistics compilers guide for European statistics on international supply of services by mode of supply. Luxembourg: Eurostat.

Eurostat. (n.d.). Services trade statistics by modes of supply. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Services_trade_statistics_by_modes_of_supply.

Fally, T. (2015). Structural gravity and fixed effects. Journal of International Economics, 97(1), 76–85. https://doi.org/10.1016/j.jinteco.2015.05.005.

Fontagné, L., & Pajot, M. (2001). Foreign trade and FDI stocks in British, US, and French industries: Complements or substitutes? In N. Pain (Ed.), Inward investment, technological change and growth (Vol. 1, pp. 240–264). London: Palgrave Macmillan.

François, J., & Hoekman, B. (2010). Services trade and policy. Journal of Economic Literature, 48(3), 642-692. https://www.jstor.org/stable/20778764.

Fraser, B. (2021). Services trade modelling: DIT analysis working paper (No. 110321). University Library of Munich. https://mpra.ub.uni-muenchen.de/110321/.

French, S. (2017). Comparative advantage and biased gravity. Discussion Papers (No. 3), 1-47.

Freund, C., & Weinhold, D. (2002). The Internet and international trade in services. American Economic Review, 92(2), 236-240.

García-Herrero, A., Felbermayr, G., Langhammer, R., Liu, W.-H., & Sandkamp, A. (2020). EU-China trade and investment relations in challenging times. Brussels: European Parliament's Committee on International Trade.

General Agreement on Trade in Services (GATS). (2024, April 29). The GATS: Objectives, coverage and disciplines. World Trade Organization. https://www.wto.org/ english/tratop_e/serv_e/gatsqa_e.htm.

Georgetown Law Library. (n.d.). International investment law research guide. https://guides.ll.georgetown.edu/InternationalInvestmentLaw.

Ghiretti, F. (2023). The renewed push for supply resilience should not create illusions about the need for a form of free trade. In I. di Carlo (Ed.), EU-China relations at a crossroads, Vol. II: Decoding complexity, mitigating risk (Vol. 1, pp. 12–15). Brussels: European Policy Centre.

Gil-Pareja, S., Llorca, R. J., & Martínez-Serrano, A. (2008). Assessing the enlargement and deepening of the European Union. The World Economy, 31(9), 1253–1272. https://doi.org/10.1111/j.1467-9701.2008.01120.x.

Gopalan, S., Park, C.-Y., & Rajan, R. S. (2023). Do international investment agreements attract foreign direct investment inflows? Revisiting the literature. Economic Analysis and Policy, 80, 471–481. https://www.sciencedirect.com/science/article/pii/S0313592623002096.

Greenaway, D., Lloyd, P. J., & Milner, C. (2001). Intra-industry foreign direct investment and trade flows: New measures of global competition. In L. K. Cheng & H. Kierzkowski (Eds.), Global production and trade in East Asia (Vol. 1, pp. 111–128). Springer.

Grünfeld, L. A., & Moxnes, A. (2003). The intangible globalization: Explaining the patterns of international trade in services. Norwegian Institute of International Affairs.

Gurevich, T., & Herman, P. (2018). The dynamic gravity dataset. Economics Working Paper Series, 2018(2), 3–24. https://api.semanticscholar.org/ CorpusID:209442418.

Hallward-Driemeier, M. (2009). Do bilateral investment treaties attract foreign direct investment? Only a bit... and they could bite. In K. P. Sauvant & L. E. Sachs (Eds.), The effect of treaties on foreign direct investment: Bilateral investment treaties, double taxation treaties, and investment flows (Vol. 11, pp. 349–378). Oxford University Press.

Hallward-Driemeier, M., & Nayyar, G. (2017). Trouble in the making? The World Bank Group.

Head, K., & Mayer, T. (2014). Gravity equations: Workhorse, toolkit, and cookbook. Handbook of International Economics, 4(1), 131–195.

Head, K., Mayer, T., & Ries, J. (2009). How remote is the offshoring threat? European Economic Review, 53(4), 429-444. https://doi.org/10.1016/ j.euroecorev.2008.08.001.

Head, K., Mayer, T., & Ries, J. (2010). The erosion of colonial trade linkages after independence. Journal of International Economics, 81(1), 1–14. https://www.sciencedirect.com/science/article/pii/S0022199610000036.

Heid, B., & Vozzo, I. (2020). The international trade effects of bilateral investment treaties. Economics Letters, 196(1), 109569. https://doi.org/10.1016/j.econlet.2020.109569.

Hoekman, B. (2006). Liberalizing trade in services: A survey. The World Bank Group.

Hoekman, B., & Kostecki, M. (2009). Services. In B. Hoekman & M. Kostecki (Eds.), The political economy of the world trading system: The WTO and beyond (3rd ed., Vol. 1, pp. 317–370). Oxford University Press.

Hofmann, C., Osnago, A., & Ruta, M. (2017). Horizontal depth: A new database on the content of preferential trade agreements (World Bank Policy Research Working Paper No. 7973). The World Bank. https://ssrn.com/abstract=2923535.

Horn, H., & Tangerås, T. (2021). Economics of international investment agreements. Journal of International Economics, 131, 103433. https://www.sciencedirect.com/science/article/pii/S0022199621000106.

Houde, M.-F., & Yannaca-Small, K. (2004). Relationships between international investment agreements. OECD Working Papers on International Investment, 2004(1), 2–22. https://doi.org/10.1787/18151957.

International Monetary Fund. (2025, February 25). Global trade liberalization and developing countries. https://www.imf.org/external/np/exr/ib/2001/110801.htm.

Islam, M. S., & Beloucif, A. (2024). Determinants of foreign direct investment: A systematic review of the empirical studies. Sage Journals, 59(2), 309–337. https://doi.org/10.1177/00157325231158846.

Jacks, D., Meissner, C., & Novy, D. (2008). Trade costs, 1870–2000. American Economic Review, 98(2), 529–534. https://econpapers.repec.org/article/aeaaecrev/v_3a 98_3ay_3a2008_3ai_3a2_3ap_3a529-34.htm.

Jandhyala, S., Henisz, W. J., & Mansfield, E. D. (2011). Three waves of BITs: The global diffusion of foreign investment policy. Journal of Conflict Resolution, 55(6), 1047–1073. https://doi.org/10.1177/0022002711414373.

Jandhyala, S., Weiner, R. J. (2013). Institutions sans frontières: International agreements and foreign investment. Journal of International Business Studies, 45(6), 649–669.

Jansen, M., & Piermartini, R. (2004). The impact of Mode 4 on trade in goods and services. Economic Research and Statistics Division.

Kang, J. W., Helble, M., Avendano, R., Crivelli, P., & Tayag, M. C. (2022). Unlocking the potential of digital services trade in Asia and the Pacific. Asian Development Bank.

Khachaturian, T., & Oliver, S. (2021). The role of "mode switching" in services trade. U.S. International Trade Commission (USITC) ID, (071), 1-50. www.usitc.gov

Kimura, F., & Lee, H.-H. (2006). The gravity equation in international trade in services. Review of World Economics, 142(1), 92–121.

Kose, A., & Mulabdic, A. (2025, February 9). Global trade has nearly flatlined. Populism is taking a toll on growth. World Bank Blogs. https://blogs.worldbank.org/en/voices/global-trade-has-nearly-flatlined-populism-taking-toll-growth

Lamprecht, P., & Miroudot, S. (2020). The value of market access and national treatment commitments in services trade agreements. The World Economy, 43(11), 2880–2904. https://doi.org/10.1111/twec.13037

Larch, M., Wanner, J., Yotov, Y. V., & Zylkin, T. (2018). Currency unions and trade: A PPML re-assessment with high-dimensional fixed effects. Oxford Bulletin of Economics and Statistics, 81(3), 487-510. https://doi.org/10.1111/obes.12283

Larson, J., Baker, J., Latta, G., Ohrel, S., & Wade, C. (2018). Modeling international trade of forest products: Application of PPML to a gravity model of trade. Forest Products Journal, 68(3), 303–316. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7147786/

Lennon, C. (2008). Trade in services: Cross-border trade vs. commercial presence. Evidence of complementarity. Paris School of Economics Working Papers, 2008(53), 1–41. https://econpapers.repec.org/paper/halpsewpa/halshs-00586217.htm

Liberatore, A., & Wettstein, S. (2021). The OECD-WTO balanced trade in services database (BaTIS). World Trade Organization.

Limão, N. (2016). Preferential trade agreements. NBER Working Paper Series.

Lodefalk, M. (2014). The role of services for manufacturing firm exports. Review of World Economics, 150(1), 59-82.

Lodefalk, M. (2015). Servicification of manufacturing firms makes divides in trade policy-making antiquated. Örebro University Working Paper, 1(2015), 1–16.

Loungani, P., Mishra, S., Papageorgiou, C., & Wang, K. (2017). World trade in services: Evidence from a new dataset. International Monetary Fund.

Lund, S., Mnyika, J., Woetzel, L., Bughin, J., Krishnan, M., Seong, J., & Muir, M. (2019). Globalization in transition: The future of trade and value chains. https://www.mckinsey.com/featured-insights/innovation-and-growth/globalization-in-transition-the-future-of-trade-and-value-chains

Marx, A., & Mattioli, P. (2023). The potential of trade and investment policies to address labour market issues in supply chains.

Mattoo, A., Mulabdic, A., & Ruta, M. (2022). Trade creation and trade diversion in deep agreements. Canadian Journal of Economics, 55(3), 1598–1637. https://doi. org/10.1111/caje.12611

Mattoo, A., Rathindran, R., & Subramanian, A. (2001). Measuring services trade liberalization and its impact on economic growth: An illustration. Journal of Economic Integration, 21(1), 64–98.

Mattoo, A., Rocha, N., & Ruta, M. (2020). The evolution of deep trade agreements. World Bank Group. https://hdl.handle.net/10986/33944

McCallum, J. (1995). National borders matter: Canada-U.S. regional trade patterns. The American Economic Review, 85(3), 615–623. https://www.jstor.org/ stable/2118191

Midttun, A. (2001). European energy industry business strategies: Perspectives on commercial positioning in the deregulated European electricity markets. Elsevier Global Energy Policy and Economics Series.

Miroudot, S. (2017). The servicification of global value chains: Evidence and policy implications. Trade and Agriculture Directorate, Organization for Economic Cooperation and Development.

Miroudot, S., & Pertel, K. (2015). Water in the GATS: Methodology and results. (No. 185).

Moshirian, F. (2004). Financial services: Global perspectives. Journal of Banking & Finance, 28(2), 269–276. https://doi.org/10.1016/j.jbankfin.2003.10.002

Nayyar, G., Hallward-Driemeier, M., & Davier, E. (2021). At your service? The promise of services-led development.

Nielson, J., & Taglioni, D. (2003). A quick guide to the GATS and Mode 4. OECD and World Bank.

Nielson, J., & Taglioni, D. (2004). Services trade liberalisation: Identifying opportunities and gains. OECD Trade Policy Papers, 1.

OECD. (2002). GATS: The case for open services market.

OECD. (2006). Trade policy. In J. Gage, S. Miroudot, & D. Andrew (Eds.), Policy framework for investment: A review of good practices (Vol. 19, 1st ed., pp. 53–88). OECD Publishing.

Olivero, M. P., & Yotov, Y. V. (2012). Dynamic gravity: Endogenous country size and asset accumulation. Canadian Journal of Economics, 45(1), 64–92. https://doi. org/10.1111/j.1540-5982.2011.01687.x

Organisation for Economic Co-operation and Development (OECD). (2018). Trade in value-added. http://www.oecd.org/industry/ind/measuring-trade-in-value-added.htm

Ortiz-Ospina, E., Beltekian, D., & Roser, M. (2024, February 24). Trade and globalization. Our World in Data. https://ourworldindata.org/trade-and-globalization

Pekarskiene, I., & Susniene, R. (2015). Features of foreign direct investment in the context of globalization. Procedia - Social and Behavioral Sciences, 213, 204–210. https://www.sciencedirect.com/science/article/pii/S1877042815057821

Qi, Y., Mao, Z., Zhang, M., & Guo, H. (2020). Manufacturing practices and servitization: The role of mass customization and product innovation capabilities. International Journal of Production Economics, 288.

Rose, A. K. (2000). One money, one market: The effect of common currencies on trade. Economic Policy, 15(30), 8–45. https://academic.oup.com/economicpolicy/ article/15/30/08/2366365

Sachs, L., & Sauvant, K. (2009). BITs, DTTs, and FDI flows: An overview. Oxford University Press, 1(1), 27–62. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2994235

Sáez, S., Taglioni, D., van der Marel, E., Hollweg, C. H., & Zavacka, V. (2014). Valuing services in trade: A toolkit for competitiveness diagnostics. World Bank.

Salacuse, J. W. (2015). The general structure of investment treaties. In J. W. Salacuse (Ed.), The law of investment treaties (3rd ed., Vol. 1, pp. 127–255). Oxford University Press.

Salacuse, J., & Sullivan, N. (2009). Do BITs really work? An evaluation of bilateral investment treaties and their grand bargain. In K. P. Sauvant & L. E. Sachs (Eds.), The effect of treaties on foreign direct investment (Vol. 46, online ed., pp. 109–162). Oxford Academic.

Santos Silva, J., & Tenreyro, S. (2022). The log of gravity at 15. Portuguese Economic Journal, 21(1), 423-437. https://doi.org/10.1007/s10258-021-00203-w

Sauvant, K. (2008). The rise of international investment, investment agreements and investment disputes. In K. Sauvant & M. Chiswick-Patterson (Eds.), Appeals mechanism in international investment disputes (Vol. 1, 1st ed., pp. 3–16). Oxford University Press.

Shepherd, B. (2016). Alternative gravity model estimators. In B. Shepherd (Ed.), The gravity model of international trade: A user guide (Vol. 1, 1st ed., pp. 51–58). UNESCAP.

Shima, Y. (2015). The policy landscape for international investment by government-controlled investors: A fact-finding survey. OECD Working Papers on International Investment. https://dx.doi.org/10.1787/5js7svp0jkns-en

Swenson, D. (2008). Bilateral investment treaties and international integration. University of California Department of Economics Working Paper. Takamichi, I. (2020). The evolution of investment liberalization under the recent investment treaties. Public Policy Review, 16(5). Policy Research Institute, Ministry of Finance, Japan.

Tamirisa, N. T., Lehmann, A., & Wieczorek, J. (2003, December 1). International trade in services: Implications for the Fund. IMF Policy Discussion Papers, 2-24.

Tenreyro, S., & Santos Silva, J. M. C. (2006). The log of gravity. The Review of Economics and Statistics, 88(4), 641-658. https://doi.org/10.1162/rest.88.4.641

Teo, T. K. (2021). Natural resources, property rights, and the domestic logic of BIT signing. Journal of Social and Political Sciences, 4(1), 1–17. https://ssrn.com/ abstract=3806493

Tobin, J., & Busch, M. (2010). A BIT is better than a lot: Bilateral investment treaties and preferential trade agreements. World Politics, 62(1), 1-42.

Tobin, J., & Rose-Ackerman, S. (2003). Foreign direct investment and the business environment in developing countries: The impact of bilateral investment treaties. William Davidson Institute Working Paper (No. 587).

Tobin, J., & Rose-Ackerman, S. (2006). Bilateral investment treaties: Do they stimulate foreign direct investment?

Tomiura, E. (2023). Challenging times for international trade: Realigning supply chains to overcome stagnation. RIETI.

UNCEISC. (2024, November 5). Summary of Day 2 discussion session. Second 2024 Meeting.

UNCTAD. (2005). World investment report: Transnational corporations and the internationalization of R&D. United Nations Conference on Trade and Development.

UNCTAD. (2007). Bilateral investment treaties 1995-2006: Trends in investment rulemaking. United Nations Conference on Trade and Development.

UNCTAD. (2017). El papel de la economía y el comercio de servicios en la transformación estructural y el desarrollo inclusivo.

UNCTAD. (2024a, December). Developing economies surpass \$1 trillion mark in digitally deliverable services exports. https://unctad.org/news/developingeconomies-surpass-1-trillion-mark-digitally-deliverable-services-exports

UNCTAD. (2024b). Rethinking development in the age of discontent. Geneva.

United Nations Conference on Trade and Development. (2006). The entry into force of bilateral investment treaties (BITs). United Nations.

Van der Marel, E. (n.d.). Does comparative advantage induce unilateral liberalization? The case of services. ECIPE, Brussels.

Van der Marel, E., & Shepherd, B. (2013). Services trade, regulation, and regional integration: Evidence from sectoral data. The World Economy, 36(11), 1393–1405.

Vandermerwe, S., & Rada, J. (1988). Servitization of business: Adding value by adding services. European Management Journal, 6(4), 314-324.

Vandevelde, K. (2009). A brief history of international investment agreements. In L. Sachs & K. Sauvant (Eds.), The effect of treaties on foreign direct investment: Bilateral investment treaties, double taxation treaties and investment flows (Vol. 1, online ed., pp. 3–36). Oxford University Press.

Vandevelde, K. J. (2010). Bilateral investment treaties: History, policy, and interpretation. Thomas Jefferson School of Law Research Paper (No. 3022249), 82(1), 328–332. https://ssrn.com/abstract=3022249

Walsh, K. (2006). Trade in services: Does gravity hold? A gravity model approach to estimating barriers to services trade. IIS Discussion Paper Series, 1(183), 1–41. http://dx.doi.org/10.2139/ssrn.945335

Webb Yackee, J. (2008). Bilateral investment treaties, credible commitment, and the rule of (international) law: Do BITs promote foreign direct investment? Law & Society Review, 42(4), 805–832.\\

Willemyns, I. (2018). The GATS (in)consistency of barriers to digital services trade. Leuven Centre for Global Governance Studies.

World Bank. (2021). World development report 2021. https://wdr2021.worldbank.org/the-report/

WTO & World Bank. (2023). Trade in services for development. World Trade Organization.

WTO Economic Research and Analysis Division. (2001). Market access: Unfinished business. Post Uruguay Round inventory. World Trade Organization.

WTO. (2019). World trade report: Why services trade matters. Geneva.

WTO. (n.d.). Trade in services by mode of supply dataset. https://www.wto.org/english/res_e/statis_e/gstdh_mode_supply_e.htm

Xiong, T., & Sun, H. (2022). The international service trade effects of bilateral investment treaties. World Economy, 46(8), 2538-2555.

Yamori, N. (1998). A note on the location choice of multinational banks: The case of Japanese financial institutions. Journal of Banking & Finance, 22(1), 109–112. https://doi.org/10.1016/S0378-4266(97)00040-X

Yi, X., & Koopman, R. (2019). World trade report 2019: The future of services trade. World Trade Organization.

Yotov, Y., Piermartini, R., Monteiro, J.-A., & Larch, M. (2016). An advanced guide to trade policy analysis: The structural gravity model. World Trade Organization.

Annexes

ANNEX 1. ABBREVIATIONS AND ACRONYMS

Appreviation	Explanation
BaTiS	Balanced International Trade in Services
BITs	Bilateral Investment Treaties
BOP	Balance of Payments
BPM	Balance of Payments and international investment Position Manual
CEPII	Centre d'Études Prospectives et d'Informations Internationales
	Centre for Prospective Studies and International Information
DGD	Dynamic Gravity Dataset
EBOPS	Extended Balance of Payments Services Classification
EMDEs	Emerging Markets and Developing Economies
EU	European Union
FDI	Foreign Direct Investment
FEs	Fixed Effects
FTA	Free Trade Agreement
GATS	The General Agreement on Trade in Services
GATT	The General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GVC	Global Value Chain
HIC	High Income Countries
ICT	Information and communications technology
llAs	International Investment Agreements
ILO	International Labour Organisation
ЮТ	Internet of Things
IPR	Intellectual Property Rights
ITPD-E	International Trade and Production Database for Estimation
LDCs	Least Developed Countries
LIC	Low Income Countries
LMIC	Lower Middle-Income countries
MRTs	Multilateral Resistance Terms
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares regression
PPML	Poisson Pseudo-Likelihood
PPMLHDFE	Poisson pseudo-likelihood regression with multiple levels of fixed effects
PTA	Preferential Trade Arrangement
RTA	Regional Trade Agreement
SOEs	State Owned Enterprises
SPTA	Services Preferential Trade Agreement
STRIs	World Bank Services Trade Restrictiveness Indices
TIPs	Treaties with Investment Provisions
TiSMoS	Trade in Services by mode of Supply database
TiVA	Trade in Value Added
UMIC	Upper Middle-Income countries
UNCEISC	United Nations Committee of Experts on International Statistical Classification
UNCTAD	The United Nations Conference on Trade and Development
UNSD	United Nations Statistics Division
US	The United States of America
USITC	United States International Trade Commission
ωтο	World Trade Organisation

Data source: author's elaboration

ANNEX 2. SERVITISATION BY INCOME GROUP



Figure 3. Share of value-added GDP by sector and World Bank income group (1990 to 2022) **Data source:** author's elaboration with data from World Development Indicators (World Bank, 2024).

ANNEX 3. MODES OF SUPPLY CLASSIFICATION

	EBOPS 2010		Mode ty	pe (%)	
ltem	Description	M1	M2	М3	M4
SA	Manufacturing services on physical inputs owed by others		100		
SB	Maintenance and repair services n.i.e		90		10
SC	Transport	90	10		
SC1	Sea transport	100			
SC11	Passenger (Sea)	100			
SC12	Freight (Sea)	100			
SC13	Other (Sea)		100		
SC2	Air transport	100			
SC21	Passenger (Air)	100			
SC22	Freight (Air)	100			
SC23	Other (Air)		100		
SC3	Other modes of transport	100			
SC31	Passenger (Other)	100			
SC32	Freight (Other)	100			
SC33	Other (Other)		100		
SC4	Postal and courier services	100			
SD	Travel (services only)		100		

SI	Telecommunications, computer, and information services	80		20
SI1	Telecommunications services	100		
SI2	Computer services	75		25
SI3	Information services	100		
SJ	Other business services	80		20
SJ1	Research and development services	90		10
SJ2	Professional and management consulting services	75		25
SJ3	Technical, trade-related and other business services	80		20
SJ31	Architectural, engineering, scientific, and other technical services	75		25
SJ311	Architectural services	75		25
SJ312	Engineering services	75		25
SJ313	Scientific and other technical services	75		25
SJ32	Waste treatment and de-pollution, agricultural and mining services		10	90
SJ321	Waste treatment and de-pollution		75	25
SJ32 2	Service incidental to agriculture, forestry and fishing			100
SJ32 3	Services incidental of mining, and oil and gas extraction			100
SJ33	Operating leasing services	100		
SJ34	Trade-related services	100		

Table 5. Recommended allocation of EBOPS 2010 items to modes of supply according to the Eurostat-WTO model Data source: author's elaboration with data from Eurostat and WTO, 2010

Notes: The United Nations Statistics Division (UNSD) is working on a revision of the Extended Balance of Payments Services Classification (EBOPS), which is expected to be submitted for endorsement at the 2025 meeting of the United Nations Committee of Experts on International Statistical Classification (UNCEISC) (UNCEISC, 2024). Given that most countries worldwide imposed travel restrictions in 2020 and 2021, the WTO developed a method to adjust mode allocations for the reference years affected by COVID-19. This method consists of increasing mode 1 allocation shares by 20% for the respective years (Eurostat, 2023).



Figure 4. Ratio of mode 3 to cross-border trade in services by industry (2000 and 2014) Source: Andrenelli et al (2018), using analytical AMNE database.

ANNEX 4. DATA SOURCES AND DESCRIPTION

Variable	Variable Description	Source	Period
TRADEEXP	Service trade export flows covering mode 1, 2 and 4 only. Variable measured in thousand current USD.	WTO-OECD Balanced Trade in Services Dataset (BaTiS). Sixth Edition of the Balance of Payments and International Investment Position Manual (BPM6)	2005-2021
TIP _{ijt}	Dummy equal to unity for country pairs sharing a TIP or equal to 0 otherwise.	Own elaboration from data extracted from "Horizontal Depth: A New Database on the Content of Preferential Trade Agreements" (Hofmann, Osnago, and Ruta 2017).	2005-2021
BIT _{ijt}	Dummy equal to unity for country pairs sharing a BIT or equal to 0 otherwise.	Own elaboration from data extracted from the International Investment Agreement Database by the United Nations Conference on Trade and Development (UNCTAD) website.	2005-2021
FTA _{ijt}	Dummy equal to unity if country pairs are part of a Free Trade Agreement in year t	Own elaboration from data extracted from "Horizontal Depth: A New Database on the Content of Preferential Trade Agreements" (Hofmann, Osnago, and Ruta 2017).	2005-2021
OECD _{ijt}	Dummy equal to unity if country pair is member of the OECD in year t	Own elaboration from data extracted from the Organisation for Economic Co- operation and Development (OECD) website.	2005-2021
EUijt	Dummy equal to unity if both countries are members of the EU in year t	Own elaboration from data extracted from the European Neighbourhood Policy and Enlargement Negotiations (DG NEAR) website.	2005-2021
GATTijt	Dummy equal to unity if country pair is member of GATT in year t	Centre for Prospective Studies and International Information (CEPII)	2005-2021
asym_TIP _{ijt}	Dummy equal to unity if either the exporter or the partner country is classified as a lower- middle-income country while the other country is classified as a high-income country, or vice versa. Dummy is equal to 0 otherwise.	Own elaboration from data extracted from World Bank country classifications by income level (World Bank Group 2024).	2005-2021
ln(DIST _{ij})	Simple distance between the two most populated cities in reporter country and partner country. The variable was transformed to logarithms to bring it closer to a normal distribution, since it was right skewed, and for consistency with previous literature. Variable measured in km.	Centre for Prospective Studies and International Information (CEPII)	NA
ln(GDPi)	Gross Domestic Product of reporter country converted to logarithms. The variable was transformed to logarithms to bring it closer to a normal distribution, since it was right skewed, and for consistency with previous literature. Variable measured in current thousand dollars.	Centre for Prospective Studies and International Information (CEPII)	2005-2021
ln(GDP _j)	Gross Domestic Product of partner country. The variable was transformed to logarithms to bring it closer to a normal distribution, since it was right skewed, and for consistency with previous literature. Measured in current thousand dollars.	Centre for Prospective Studies and International Information (CEPII)	2005-2021
CONTIG _{ij}	Dummy equal to unity if reporter country and partner country share a similar border	Centre for Prospective Studies and International Information (CEPII)	2005-2021

		Se	ctorial aggregated data		Sectorial segregated data					
Variable	Observations	Mean	Standard Deviation	Min	Max	Observations	Mean	Standard Deviation	Min	Мах
TRADEEXP	429,068	102.719	1032.419	0	74772.56	5,115,720	8.615297	146.0072	0	41868.83
TIP _{ijt}	529,832	0.0796	0. 2707417	0	1	5,252,338	0.093387 4	0.2909745	0	1
BIT _{ijt}	529,832	0.0543	0.2267949	0	1	5,252,338	0.0170141	0.1293239	0	1
FTA _{ijt}	488,544	0.0251	0.1564511	0	1	5,211,344	0.0261142	0.1594749	0	1
OECD _{ijt}	488,544	0.0226	0.1488933	0	1	5,211,344	0.0255182	0.1576928	0	1
EU _{ijt}	488,544	0.0157	0.1243909	0	1	5,211,344	0.0176845	0.131802	0	1
GATT _{ijt}	488,544	0.3602	0.4800876	0	1	5,208,292	0.399703 4	0.4898374	0	1
asym_TIP _{ijt}	488,544	0.0063	0.0793794	0	1	5,211,344	0.0070176	0.0834765	0	1
ln(DIST _{ij})	488,542	8.7765	0.7906092	3.135	9.895	5,208,268	8.760851	0.78913	3.135	9.895657
ln(GDP _i)	453,426	17.03506	2.427324	9.991	23.61567	4,865,471	17.17767	2.374886	09.99	23.61567
ln(GDP _j)	453,426	17.03506	2.427324	9.991	23.61567	4,865,471	17.17767	2.374886	9.991	23.61567
CONTIG _{ij}	488,544	0.014271	0.1186058	0	1	5,208,292	0.0156454	0.1240994	0	1
LANG _{ij}	463,582	0.1581985	0.3649275	0	1	5,135,656	0.1529117	0.3599024	0	1
COL45 _{ij}	463,582	0.006454 1	0.0800778	0	1	5,135,656	0.0066613	0.0813443	0	1
PTA _{ijt}	488,544	0.057734 8	0.2332416	0	1	5,211,344	0.0631423	0.2432187	0	1

 Table 7. Summary Statistics with BaTiS sectorial aggregated data and sectorial segregated data

 Source:
 author's elaboration.

ANNEX 5. ROBUSTNESS CHECKS

This paper conducts two main robustness checks with another data source for services exports flows: OECD Trade in Value Added Data (TiVA). On the one hand, Table 8 summarises the estimation results in services trade by type of industry with a Dynamic Gravity Dataset (DGD) from the United States International Trade Commission (USITC) for gravity data. On the other hand, Table 10 presents the estimation results with the TiVA dataset, using Centre for Prospective Studies and International Information (CEPII) data for gravity instead. The results of both Tables 8 and 10 show similarity with the PPMHDLFE results with the BaTiS database; however, the CEPII gravity dataset better predicts the significant negative effect of IIAs on trade in services between countries with different income levels.

It is noted that the WTO Trade in Services by Mode of Supply (TiSMoS) database provides estimates of trade in services broken down by the four modes of supply, which depicts "a more comprehensive picture of global trade in services" (Kang et al., 2022, p. 27). Based on experimental statistics, the WTO Secretariat estimated "the total value of GATS services trade by modes of supply, including via mode 3" (Cernat, 2024). However, the TiSMoS database was rejected, given that the data comes with significant gaps that did not allow to have a comprehensive picture of the implications in countries of different income types.

First, the negative and significant relationship between TIPs and cross-border services trade is consistent with previous findings in this research, as it remains negative and significant for industries related to mode 1 of supply. As can be appreciated in Figure 5, the sectors where cross-border gross exports are more important than the output of foreign affiliates are land transport, water transport and air transport. This is consistent with the results found, as (i) land transport and transport via pipelines (H49), (ii) air transport (H51), (iii) accommodation and food service activities (I), (iv) publishing, audiovisual and broadcasting activities (J58T60), (v) real estate activities (L), (vi) public administration and defence; compulsory social security (O), (vii) human health and social work activities (Q), and (viii) other service activities (S) report negative significant coefficients. The only difference when using the CEPII database for gravity is that the publishing, audiovisual and broadcasting industries are not significant anymore, but this does not alter the research conclusions.

Therefore, the presentation of the results by industry allows us to understand why we did not find a significant result in columns 5 to 8 in Table 1 when the research results were detailed. There are two industries that show a clear positive correlation with TIPs, namely, (i) postal and courier activities (H53) and (ii) telecommunications (J61). As Andrenelli et al. (2018, 20) explain, "Telecommunications are an industry where the supply of services through mode 3 is much more important than cross-border, and the ratio has significantly increased over time with paid international telecommunications progressively becoming marginal", which is replicated for postal and courier activities (H35). Given that these industries are increasingly provided through commercial presence, which complements TIPs, TIPs did not show a positive result when regressing with TiVA in Table1.

Second, when regressing for BITs, the negative and significant correlation is not as consistent, given that (i) postal and courier activities (H53), (ii) accommodation and food service activities (I), and (iii) telecommunications (J61) are significantly negative. On the other hand, we find a positive relation in industries such as (i) land transport and transport via pipelines (H49), (ii) air transport (H51), (iii) warehousing and support activities for transportation (H52), (iv) publishing, audiovisual and broadcasting activities (J58T60), (v) IT and other information services (J62_63), and (vi) financial and insurance activities (K). The reasons may be that (1) as BITs are pure investment treaties, and (2) the TiVA database incorporates more mode 3 data than mode 1, the results are biased by the strong complementarity of investment and BITs. The only difference with the CEPII database is that accommodation activities are no longer significant, which does not change these implications.

Therefore, this explains why, when regressing in aggregate terms the TiVA dataset with BITs (see Table 1 presented in the main body of the paper), the substitution effect is not statistically significant, while when regressing with BaTis, it indeed is. The underlying reason is that IIAs have a catalyst effect on industries increasingly supplied by commercial presence, such as telecommunications or postal and courier activities. The positive correlation that BITs show on mode 3 of supply is such that is able to compensate for the negative effect of the other modes of supply, leading to a complementarity effect between BITs and aggregate services trade exports. Therefore, we could claim that BITs are better at promoting investment and FDI than TIPs are.

Third, the substitution effect is especially true for countries of different income types. Concretely, the effect is stronger in industries such as water (H50) and air transport (H51), IT and information services (J62_63), or financial and insurance activities (K). Interestingly, the two latter are industries that are increasingly being supplied cross-border. However, we can see that the substitution effect is not true for the EU; rather, EU countries boost services trade when signing a TIP. Concretely, in industries such as road transport (H49) or accommodation and food service activities (I).

In conclusion, the three main findings of this thesis are (i) a negative relationship between IIAs and service trade, explained by (ii) the negative and significant effect of IIAs on cross-border investments, and (iii) a greater negative effect between countries of different income type than between symmetrical income countries, are consistent after having carried out the robustness checks. All in all, this paper finds empirical evidence to confirm the substitutability effect between IIAs and mode 1 of supply, and the complementarity effect between IIAs and mode 3.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Sector	H49	H50	H51	H52	H53	I.	J58T60	J61	J62_63	К	L
Trade dataset	TiVA	TiVA	TiVA	TiVA	TiVA	TiVA	TiVA	TiVA	TiVA	TiVA	TiVA
TIP	-0.076***	-0.028	-0.054***	-0.015	0.263***	-0.089**	-0.061*	0.108***	-0.048	-0.004	-0.061*
BIT	0.162**	0.054	0.101**	0.079*	-0.388**	-0.136*	0.213*	-0.174**	0.148*	0.235**	-0.111
FTA	0.078*	-0.006	-0.068*	0.056	0.274**	0.110*	-0.135	0.087	-0.181***	-0.079	0.080
OECD	0.035	0.006	0.046	-0.057	-0.444**	0.000	0.099	0.050	-0.152	0.234*	0.006
EU	0.062	0.099*	0.208***	0.065	0.033	0.125	0.331***	-0.064	0.077	0.281**	0.147**
asym_TIP	0.077*	-0.144*	-0.084**	0.071	0.160	0.103**	0.076	-0.035	-0.159*	-0.252*	0.055
PTA services	0.077***	0.043	0.038*	0.013	-0.327***	0.019	0.098**	-0.096**	0.103**	0.043	0.063
FE exp-year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE imp-year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE pair	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE sector	No	No	No	No	No	No	No	No	No	No	No
Countries	All	All	All	All	All	All	All	All	All	All	All
Observations	62,568	57,640	61,248	60,379	42,641	61,314	57,453	59,433	56,100	61,061	56,661
		Table 8.	Gravity model	regressior	ı with TiVA fo	or trade data	and ITPD-E	for gravity			

Source: authors' elaboration.

*** significant at 1 %, ** significant at 5 %, * significant at 10%

	(12)	(13)	(14)	(15)	(17)	(18)	(19)
Sector	М	Ν	0	Ρ	Q	R	S
Trade dataset	TiVA	TiVA	TiVA	TiVA	TiVA	TiVA	TiVA
TIP	-0.028	0.086*	-0.106***	-0.025	-0.046*	-0.065	-0.050*
BIT	0.150*	-0.255	0.098	-0.087	-0.135*	-0.004	-0.060
FTA	-0.031	0.272***	-0.064	0.103	0.049	0.035	0.039
OECD	-0.076	0.110	0.119*	0.090*	0.144***	0.049	-0.007
EU	0.207***	0.278***	0.296***	0.317***	0.139	0.330**	0.144
asym_TIP	-0.008	0.056	0.047	-0.033	0.046	0.218***	0.080**
PTA services	0.018	-0.092	-0.027	-0.082	0.047	-0.021	0.010
FE exp-year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE imp-year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE pair	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE sector	No	No	No	No	No	No	No

Table 8. Gravity model regression with TiVA for trade data and ITPD-E for gravity – continuation

WORKINGPAPER | No. 03, 2025

Code	Industry	Code	Industry
H49	Land transport and transport via pipelines	К	Financial and insurance activities
H50	Water transport	L	Real estate activities
H51	Air transport	М	Professional, scientific and technical activities
H52	Warehousing and support activities for transportation	Ν	Administrative and support services
H53	Postal and courier activities	0	Public administration and defense; compulsory social security
I	Accommodation and food service activities	Ρ	Education
J58T60	Publishing, audiovisual and broadcasting activities	Q	Human health and social work activities
J61	Telecommunications	R	Arts, entertainment, and recreation
J62_63	IT and other information services	S	Other service activities

Table 9. TiVA Service Trade Industry Codes**Source**: authors' elaboration.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Sector	H49	H50	H51	H52	H53	I.	J58T60	J61	J62_63	К	L
Trade dataset	TiVA	TiVA	TiVA	TiVA	TiVA	TiVA	TiVA	TiVA	TiVA	TiVA	TiVA
TIP	-0.076***	-0.022	-0.047**	-0.031	0.328***	-0.036	-0.054	0.118***	-0.063*	0.023	-0.021
BIT	0.187**	0.080	0.130***	0.107**	-0.375**	-0.082	0.227*	-0.146**	0.169*	0.219*	-0.056
FTA	0.047	-0.033	-0.092**	0.021	0.258*	0.088*	-0.178	0.040	-0.185***	-0.036	0.039
OECD	0.021	-0.032	0.019	-0.072	-0.553**	0.020	0.088	0.037	-0.133	-0.037	0.018
EU	0.085	0.095	0.201***	0.087	0.012	0.186*	0.323***	-0.030	0.044	0.138	0.182**
asym_TIP	0.070	-0.156**	-0.104***	0.067	0.160	0.074**	0.087	-0.038	-0.163*	-0.303**	0.015
PTA services	0.079***	0.035	0.038*	0.034	-0.380***	0.002	0.096**	-0.106***	0.101**	-0.006	0.052
FE exp-year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE imp-year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE pair	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE sector	No	No	No	No	No	No	No	No	No	No	No
Countries	All	All	All	All	All	All	All	All	All	All	All
Obs.	60,896	55,968	59,576	58,707	40,978	59,642	55,781	57,761	54,428	59,389	54,989

Table 10. Gravity model regression with TiVA for trade data and CEPII for gravity

Source: authors' elaboration.

	(12)	(13)	(14)	(15)	(17)	(18)	(19)
Sector	М	Ν	0	Ρ	Q	R	S
Trade dataset	TiVA	TiVA	TiVA	TiVA	TiVA	TiVA	TiVA
TIP	-0.020	0.099**	-0.059	0.039	-0.094***	-0.098*	-0.072**
BIT	0.135	-0.259	0.047	-0.179*	-0.145*	-0.067	-0.117
FTA	-0.022	0.282***	-0.050	0.145	0.038	0.078	0.077
OECD	-0.077	0.083	0.109*	0.087*	0.111*	0.085	-0.008
EU	0.214***	0.271***	0.340***	0.213**	0.031	0.266*	0.032
asym TIP	-0.018	0.065	0.023	0.036	0.091	0.229***	0.112***
PTA services	0.005	-0.110*	-0.079	-0.147**	0.077**	-0.021	0.002
FE exp-year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE imp-year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE pair	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE sector	No	No	No	No	No	No	No
Obs.	60,225	59,180	33,376	49,984	48,301	57,255	49,841

Table 10. Gravity model regression with TiVA for trade data and CEPII for gravity – continuation

 Source: authors' elaboration.

Code	Industry	Code	Industry
H49	Land transport and transport via pipelines	К	Financial and insurance activities
H50	Water transport	L	Real estate activities
H51	Air transport	М	Professional, scientific and technical activities
H52	Warehousing and support activities for transportation	Ν	Administrative and support services
H53	Postal and courier activities	0	Public administration and defense; compulsory social security
I	Accommodation and food service activities	Ρ	Education
J58T60	Publishing, audiovisual and broadcasting activities	Q	Human health and social work activities
J61	Telecommunications	R	Arts, entertainment, and recreation
J62_63	IT and other information services	S	Other service activities

Table 11. TiVA Service Trade Industry Codes

Source: authors' elaboration.



Figure 5. Regression coefficients on TIPs value with TiVA for trade data and CEPII for gravity data by sector **Source:** authors' elaboration.

Notes: The coefficients reported in this figure correspond to the regression specification presented in Table 10. For industry codes see Table 11.

ANNEX 6. IMPLICATIONS FOR GOODS TRADE

For the purpose of this research and building on previous progress, this paper began by exploring the potential implications that International Investment Agreements (IIAs) might have on goods trade. The initial hypothesis was that IIAs could potentially have a negative effect on goods trade, extending the idea of substitutability between certain types of trade agreements and cross-border trade to goods as well. However, the results contradicted this initial thought.

First, as presented in Table 12, when using BaTiS trade data and CEPII as the gravity dataset, the results revealed no statistically significant effect of BITs on aggregated trade in goods and services (columns 1 and 3). Therefore, there is insufficient evidence to conclude that BITs have a measurable impact on goods and services trade on aggregate, which might be driven by the negative and significant effect that Treaties with Investment Provisions (TIPs) have on certain sectors of services trade, counteracting the significant positive impact of TIPs on goods trade.

Second, when focusing solely on goods trade (columns 3 and 4), the regressions demonstrated that TIPs have a positive and statistically significant effect. This was not observed when goods and services trade were combined in the analysis, supporting the idea that sectoral differences likely influenced the previously non-significant effect of BITs in aggregate trade in how TIPs impact services and goods trade.

Third, the analysis also highlighted that TIPs have a consistently positive effect on goods trade exports and on aggregated exports (goods and services) between countries of different incomes. This could be explained by their expected differences in factor cost and scale economies (Lee, 2002, p. 13), trading and investing in other countries to complement their weaknesses. IIAs signed between countries of different income classifications may enable firms in developed countries to leverage cost advantages and access new markets in developing economies.

In conclusion, IIAs do not show a significant impact on aggregate goods and services trade, suggesting their role in shaping overall trade flows is limited. This may reflect the sectoral heterogeneity introduced by TIPs, which negatively influences certain service sectors but positively impacts goods trade. TIPs exhibit a positive and significant effect on goods trade alone.

	(1)	(2)	(3)	(4)					
	EXP	EXP	EXP	EXP					
Trade dataset	BaTiS	BaTiS	BaTiS	BaTiS					
Type of trade	Goods and services trade	Goods and services trade	Goods trade	Goods trade					
TIP	0.0043	0.0037	0.03495*	0.0358*					
BIT	-0.0402	NA	0.0215	NA					
FTA	0.0808	0.0657	0.0762**	0.0899***					
OECD	0.0113	0.0125	0.0049	0.0071					
EU	0.2565***	0.2568***	0.1940***	0.1940***					
asym_TIP	0.1319***	0.1315***	0.1625***	0.1627***					
PTA services	0.0409*	0.0412*	0.0153	0.0148					
FE exp-year	Yes	Yes	Yes	Yes					
FE imp-year	Yes	Yes	Yes	Yes					
FE pair	Yes	Yes	Yes	Yes					
FE sector	No	No	No	No					
Countries	All	All	All	All					
Obs.	316,277	316,277	481,942	481,942					
Table 12. Gravity model regression with CEPII as gravity dataset including goods trade									

Source: authors' elaboration.

*** significant at 1 %, ** significant at 5 %, * significant at 10%

Could Commercial Presence Substitute Cross-Border Services Trade? A Mechanism Behind the Stagnation of Services Tradesphere of Influence

UNU-CRIS Working Paper #3 2025

Copyright o United Nations University Institute on Comparative Regional Integration Studies 2025

The views expressed in this publication are those of the authors and do not necessarily reflect the views of the United Nations University.

Published by: United Nations University Institute on Comparative Regional Integration Studies