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Services in the India-EU Free Trade Agreement

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Abstract

This paper analyses the proposed free trade agreement (FTA) between EU and India focusing on services trade. Based on the text published by the European Union, I use the OECD STRI simulator to calculate the preference margin implied by the agreement and next predict the impact on services trade flows using a general equilibrium structural gravity analysis. I find that the preference margin on the STRI for Indian exports to the EU is between four and eight basis points depending on the sector, while for EU exports to India the preference margin is between 10 and 35 basis points. The predicted effect is almost a doubling of EU services exports to India, while India's services exports to the EU would increase by about 50%. EU's trade with the rest of the world would not change much, while India's exports to the rest of the world would decline by about 3%. Real services output would not change much in the EU or India. Lifting trade restrictions in the telecommunications sector is the most important policy area for facilitating services trade.

Keywords: Services, Trade, FTA, India, EU
JEL: F13, F15, F17

1 Introduction

India and the European Union entered negotiations on a free trade agreement (FTA) in 2007. However, due to slow progress, the talks were suspended in 2014. Recent geopolitical developments and concerns have prompted the parties to iron out their differences and relaunch the FTA negotiations in June 2022, together with separate talks on investment protection and geographical indicators. Furthermore, India and the EU announced the formation of an EU-India Trade and Technology Council to deepen cooperation on strategic issues related to the nexus of trade, technology and security.[1] This paper offers a first estimate of the services trade impact of this FTA and discusses some of its broader geopolitical aspects.

Against the backdrop of political instability and turbulence in the global economy, an agreement between these two giants could be of immense importance for an orderly and inclusive transition to a digital and green economy dominated by services. Thus, both parties have ambitions to lead in the governance of the digital transition and set global standards for data flows with trust as well as human-centered AI, India with a strong focus on the development aspects and both are concerned with competition and consumer rights in the digital space.

India's approach to regulation and legislation related to privacy, cross-border data flows and data localization requirements have evolved substantially in the last few years. A rather strict privacy legislation that would severely restrain cross-border data flows was withdrawn in 2019 and a revised draft more in line with European legislation was proposed in late 2022.[2]

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[1] See joint press release 25.04.2022

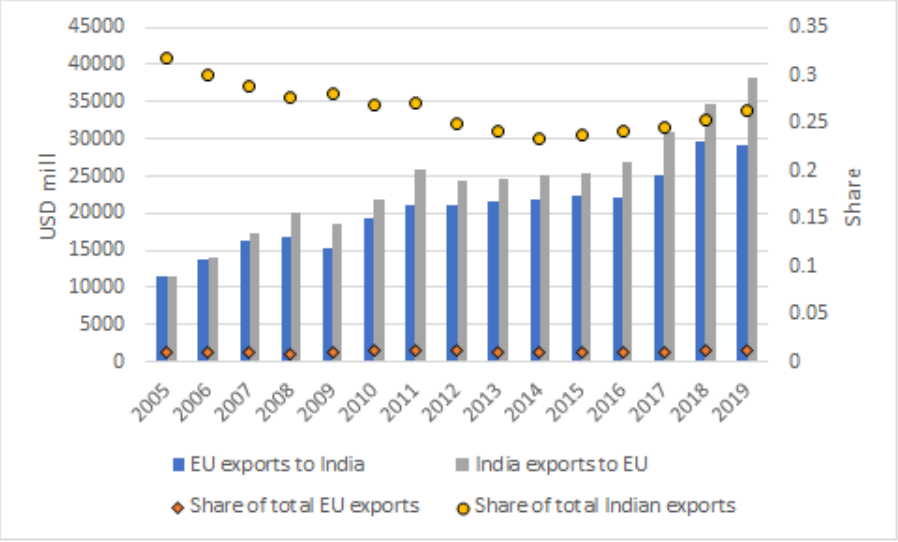
[2] see The Digital Personal Data Protection Bill

The EU is in the process of introducing new legislation for the digital economy and aims at making its regulation the global standard. The Digital Services Act and the Digital Markets Act entered into force in 2022 and will be directly applicable across the Union in 2024 while a proposed Artificial Intelligence Act has entered the EU legislative process. The package of legislation aims at creating a safer digital space, safe and secure AI, and to establish a level playing field addressing the conduct of the so-called gate-keeping digital platforms. The legislative package aims at fostering European values globally, notably the human rights approach to privacy. The EU-India FTA is an opportunity to explore how services trade and cross-border data flows with trust can be reconciled, while the Trade and Technology Council could be a vehicle for forward-looking governance.[3] For trade to resume its role as a driver of growth and development, a new source of international division of labour is needed. Services and data are the obvious candidates. This paper offers an in-depth analysis of the services provisions in the EU-India FTA and its possible impact on services trade between the Parties as well as global services trade. In addition to studying total services trade, I focus on sectors where services are mainly traded over digital networks, i.e. finance, and communication and information services, and barriers to such trade (Grimm 2016; Ferencz 2019).

Services are of particular importance to India which has experienced a unique development path largely driven by services trade, notably new services in the digital economy. Most of India's FTAs include services (Chakraborty et al. 2019), but at the same time the country has been cautious about entering deep FTAs with other major economies. For instance, India ended up not signing the Regional Comprehensive Economic Partnership (RCEP). An agreement with EU could be part of a fresh start where India has already concluded an agreement with Australia that went into force 29 December 2022.

India is EU's 10^{th} largest while EU is India's third largest trading partner. Although EU's services trade with India is close to balanced, the EU market is hugely more important for Indian exporters than the Indian market is for EU services exporters (Figure 1).

Figure 1: Services trade between EU and India



Source: WTO/OECD BATIS.

This paper contributes to the literature in three areas. First, it offers a detailed analysis of the proposed FTA text. Combining granular information on current applied services trade policy and domestic regulation from the OECD Services Trade Restrictiveness Index (STRI) database

[3]See (Mattoo and Meltzer 2018) for a discussion on privacy and cross border data flows.

with the draft text of the agreement, I calculate counterfactual, directional, bilateral trade cost indexes.[4] The analysis identifies areas where the proposed text, if implemented, would require changes in laws and regulations in each EU country and India.

The schedules of commitments to be negotiated in due course will surely moderate the market access gains entailed in the draft text, but it is still a useful benchmark for analysis, including assessing the likely trade effects of such changes. Generally, the methodology allows ex ante impact analysis of services chapters in FTAs at a granular level; assessments that are often mandated when entering into negotiations of new FTAs.

Second, the paper contributes to the empirical gravity literature analysing the drivers of trade in services, adding to a small exigent literature; e.g., (Kimura and Lee 2006; Walsh 2008; Anderson, Borchert, et al. 2018; Benz et al. 2020). My main contribution with this paper is to introduce to the services trade literature the most recent techniques from empirical gravity research (Bergstrand et al. 2015; Yotov 2022) including directional, bilateral trade costs (t_{ij}) the possibility that $t_{ij} \neq t_{ji}$ and that $t_{ii} > 1$.

Like most modern FTA's the proposed EU-India FTA contains provisions related to behind the border domestic regulation that may affect local as well as foreign services providers. The existing literature that study such unilateral policy measures add domestic trade to the gravity regressions in order to identify their impact, implicitly assuming that $t_{ii} = 1$ (Heid et al. 2021; Anderson, Borchert, et al. 2018). My paper takes this one step further, explicitly capturing variation in internal trade costs across countries. Since domestic regulation is such an important part of services trade costs, and domestic regulation varies even within the EU, this is an important dimension hitherto largely overlooked.[5]

Third, the paper offers a first estimate of the impact of the proposed EU - India FTA on services trade flows. During the first aborted negotiations a number of papers analyzed the potential political and economic impact of the agreement (Achterbosch et al. 2008) as well as proposing priorities and strategies for the negotiations (Khorana and Perdikis 2010). None of these papers quantfied the impact on trade flows. Moreover, the current proposal differs sufficiently from the previous one to warrant a fresh analysis.

I start the empirical analysis with structural gravity regressions in order to verify that FTAs and STRIs are statistically significantly associated with services trade flows for overall services trade as well as trade in specific services sectors. The regression results show that this is clearly the case. Open and well-regulated telecommunications services is the single most important driver of services trade, overall and in specific sectors, underscoring the role of digital transmission of services across borders.

The next step is to simulate the impact of the proposed FTA using general equilibrium structural gravity. Following Anderson, Larch, et al. 2018 closely, I first use a counterfactual FTA dummy as the policy variable of interest.[6] I find that the EU-India FTA would increase India's overall services exports by about 6%. Services exports to the EU would increase by almost 25%, while EU's services exports to India would increase by more than 20%, but without affecting overall trade in services much. However, the average FTA hardly offers any new market access in services, so the estimated impact using the FTA dummy mainly stems from legally binding existing restrictions

[4] The STRI suite contains a qualitative regulatory database with information on trade restrictiveness for 22 services sectors in five policy areas: Restrictions om foreign entry, Restrictions to movement of people, Other discriminatory measures, Barriers to competition, and Regulatory transparency. The measures are scored and weighted to derive quantitative trade restrictiveness indices, taking values between zero and one. The STRI simulator allows users to change policy measures and compute counterfactual indices.

[5] Since services trade agreements routinely cover commercial presence (mode 3), domestic regulation is of particular relevance to services.

[6] The FTA dummy takes the value of unity if a country pair is party to the same FTA that cover both goods and services, and zero otherwise.

(Lamprecht and Miroudot 2020).

To create scenarios that capture the horizontal and sector-specific provisions in the EU-India FTA text, I replace the FTA dummy with counterfactual STRIs. The proposed text contains substantial improvements in market access. Furthermore, since India has much higher barriers to services trade and investment in most sectors than the EU, the market access gains are highly asymmetrical. Consequently, the predicted changes in trade flows are also asymmetrical. While EU services exports to India would double, India's exports to the EU would increase by about 50%. Yet, since EU is much more important for India's services exports than is India for EU services exports (Figure 1), total exports from India will increase much more than EU's, i.e. by 25% versus about 1%.

The rest of the paper is organized as follows: The next section analyzes the proposed text of EU-India FTA and presents the counterfactual STRI scores generated by the STRI simulator when replacing actual applied policy measures by those included in the FTA where relevant. Section 3 presents the data while section 4 describes the empirical strategy for the regressions and the general equilibrium simulations. The results are presented in section five while section six concludes with a discussion on the policy implications, limitations and future research.

2 The proposed EU-India trade agreement

The negotiations build on the EU's proposed text, publicly available on the EU Commission's website. It has 20 sections of which 11 are relevant for services trade. These are:

- Chapter 7 Services and Investment
- Chapter 8 Digital Trade
- Chapter 9 Government procurement
- Chapter 10 Intellectual Property
- Chapter 11 Anti-competitive Conduct, Merger Control and Subsidies
- Chapter 12 State-owned Enterprises
- Chapter 13 Small and Medium Sized Enterprises
- Chapter 15 Transparency
- Chapter 16 Good Regulatory Practices
- Chapter 18 Dispute Settlements
- Chapter 20 Anti-Fraud

In addition to horizontal measures applying to all services sectors, the services and investment chapter has specific provisions for delivery services (postal services, courier services, other express delivery services), telecommunications, financial services and maritime transport. By the same token, the digital trade chapter includes horizontal measures applying to electronic transactions in general and a few specific measures for computer services. Similar to the GATS, the proposed agreement does not cover cross-border air transport services, and in line with EU trade and cultural policy, audiovisual services are not covered.

I match the provisions in these chapters to the OECD STRI list of measures. For each match, I compare the current applied policy recorded in the STRI database to the provision in the agreement.

Where the FTA introduces changes, I use the STRI simulator to implement these changes and produce counterfactual STRIs. Like the agreement, the STRI includes a core of horizontal measures which are found in all sectors, plus sector-specific measures where applicable.

The European Union is a customs union, but it does not have common borders for services trade with third countries, let alone common domestic regulation that affects services trade. Therefore, the preferential STRIs are calculated for each EU member country separately.[7]

2.1 Horizontal measures

The scope and architecture of the services and investment chapter follow the GATS as well as EU's other FTAs closely, and the market access and national treatment articles align with GATS articles XVI and XVII. For instance, quotas, economic needs tests, foreign equity limits, performance requirements, and nationality requirements for board members and senior management are prohibited, although exemptions may be scheduled.

Market access through temporary movement of natural persons is a priority for India (Mukherjee and Goyal 2013). It is therefore interesting to take a closer look at the horizontal provisions on trade through this mode, i.e., mode 4 in GATS terminology. The provisions are similar to the GATS in distinguishing between migration and trade.[8] The text obliges the parties to allow entry of natural persons without imposing quotas or economic needs tests. Similar to the GATS, the FTA text covers contractual services suppliers (CSS), independent services suppliers (ISS) and intra-corporate transferees (ICT) as well as business travellers. However, only high-skilled workers and management are eligible under the proposed agreement. Thus, a university degree or equivalent as well as at least three years of professional experience and employment with the sending company for at least a year prior to the placement are required to qualify as a CSS. Six years of professional experience and a university degree are required for ISS, while ICTs are defined as senior management, specialists or trainees. A university degree is required also for trainees. The committed duration of stay is six months for CSS and ISS, and three years for ICT. For short-term business visitors, the condition is that they do not provide services in the host country and the maximum duration of stay committed is 90 days. Most EU countries as well as India currently have less restrictive polices on duration of stay and qualifications than these provisions, indicating that there may be considerable "water" in the agreement on mode 4.[9]

It appears that there is a trade-off between quotas and labour market tests that limit the number of natural persons arriving in the country on the one hand and limitations on duration of stay on the other. Thus, countries that do not require quotas or labour market test tend to limit the duration of stay to a year or less. When quotas or labour markets tests are in place, in contrast, the services suppliers that have passed the test are typically allowed to stay for longer - up to three years or more. The provisions in the FTA text fall into the first category. In the counterfactual STRIs, I eliminate the quotas and labor market tests where applicable, while reducing the duration of stay when the actual is longer than suggested in the FTA. In some cases this leaves overall restrictiveness on movement of people unchanged, and in a few cases more restrictive than currently applied policies.

Turning to provisions on board members and senior management, the proposed text prohibits nationality requirements for these categories, but falls short of prohibiting residence requirement for the same. In the counterfactual STRIs, I therefore change nationality requirements from "yes"

[7] Bulgaria, Croatia, Cyprus, Malta and Romania are EU members not covered by the STRI and therefore omitted from the analysis.

[8] Trade occurs when a service is provided by a natural person employed or self-employed in her home country while providing a service in a foreign country on a temporary basis.

[9] See Miroudot and Pertel 2015 for a study on "water" in the GATS.

to "no" where such requirements are in place, while leaving residency requirements unchanged. The requirement to have a local or commercial presence as a condition for cross-border supply is eliminated in the counterfactual scenario in all sectors where relevant.

The chapter on digital trade has a similar structure and coverage as the Joint Statement Initiative (JSI) on e-commerce, a plurilateral agreement under negotiations by 87 WTO members. EU has joined this initiative, while India has not. The digital chapter follows the JSI in mandating free cross-border data flows with trust, i.e., provided that privacy is protected and cyber security ensured. Like the JSI, it leaves to the Parties' discretion to flesh out the details of privacy and cyber security legislation. The chapter has disciplines on data localization requirements and prohibits customs duties on electronic transmissions. Thus, in the counterfactual scenario data localization requirements are eliminated in the EU countries where they are found as well as in India. The chapter also contains the standard provisions for not requiring access to source code, recognising electronic signature and electronic contracts and consumer protection. These are covered by the digital STRI.

The public procurement provisions cover goods and services purchases by central and provincial governments above a certain threshold to be determined in the schedules. Non-discrimination applies to all goods and services providers *established* in the Parties, hence it appears not to cover cross-border procurement. The agreement does not seem to constrain participants' capability to use public procurement as a tool, for instance for rural development, supporting SMEs, and similar. The proposed agreement includes a number of provisions related to procedures, transparency and technical standards, which follow the structure of the WTO Government Procurement Agreement (GPA).[10] The counterfactual STRIs remove explicit discrimination in public procurement where such regulation exists, and introduces transparency measures where they are not present. Information in the STRI database reveals that several EU countries use public procurement as a tool to promote SMEs, minority-owned businesses or business located in remote areas. These are not affected by the agreement.

The intellectual property chapter intends to complement the Trade Related Aspects of Intellectual Property Rights (TRIPS) and other relevant international treaties. The chapter ensures national treatment related to the protection of intellectual property rights including copyright, trade marks and design. Although audiovisual services are not covered by the FTA, the chapter does oblige the Parties to comply with the international treaties and standards related to copyright and rights management in the music, film and broadcasting sectors. All EU countries and India have a clean score on the IP measures in the STRI, so here nothing is changed in the counterfactual STRI.

The chapter on competition entails competition policy principles, including neutrality regarding public or private ownership, as well as subsidies. State-owned enterprises, enterprises granted special rights or privileges and designated monopolies engaged in a commercial activity are also covered under the State-owned Enterprises chapter, which aims at ensuring that these compete with private companies on a levelled playing field where they do engage in commercial activities. The provisions on subsidies in chapter 11 are quite limited and prohibit unlimited guarantees for debt in specific companies, and subsidies to insolvent companies. In cases where the STRI records state-owned enterprises that have special privileges or are exempted from the local competition law, they are changed in the counterfactual STRI.

On domestic regulation, a legal obligation to publish laws and regulation prior to entry into force is included in the proposed text in Chapter 15. Not all EU countries have such an obligation, and neither has India. This measure does not lend itself to discrimination, and the countries that

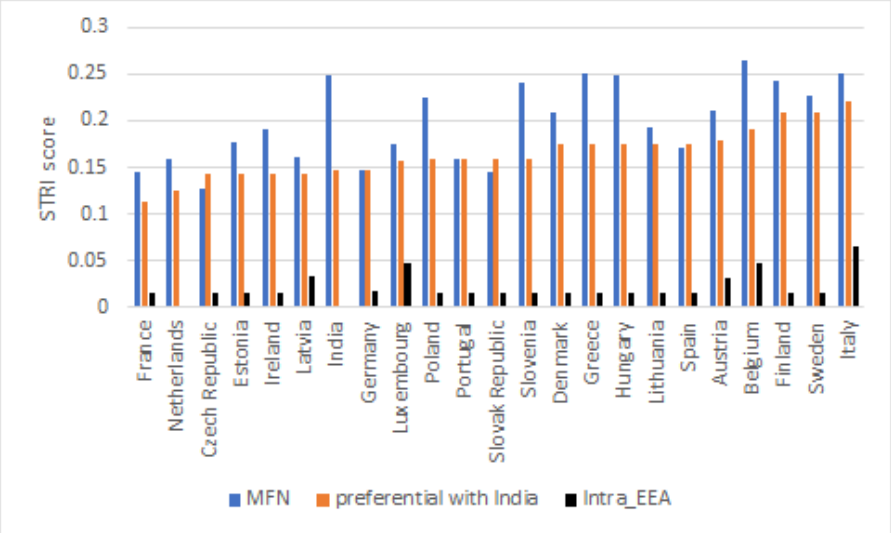
[10]The European Union is a party to the GPA, while India is an observer.

introduce this legislation following the implementation of the agreement would also lower their MFN STRI score (i.e. Belgium, India and Luxembourg).

2.2 Computer services

Computer services are not subject to sector-specific regulation in most countries and services suppliers largely face the general regulatory framework in each country. The counterfactual score is depicted in Figure 3. For comparison, I also include the intra-EEA STRIs which depict the trade restrictions between members of the European Economic Area. These are almost exclusively behind the border regulatory measures, reflecting the fact that the EU is not a fully integrated services market.[11]

Figure 2: STRI actual MFN, intra-EEA and counterfactual, computer services, 2021



Notes: The figure shows the MFN STRI score, the intra-EEA score, and the counterfactual when the STRI measures are replaced with the provisions in EU's proposed text for the EU-India FTA.

We note first, that the FTA would introduce a small preference margin, thus lowering the average bilateral India-EU restrictions by about 4 basis points (from 0.20 to 0.16). That is a modest reduction in trade restrictiveness, but it is nowhere near the market integration among EU members as displayed by the intra-EEA index. We also notice that the barriers that remain after the FTA is similar in EU and India. In fact, India will be more open to EU imports than most EU countries would be towards India in computer services after the implementation of the FTA text as proposed.

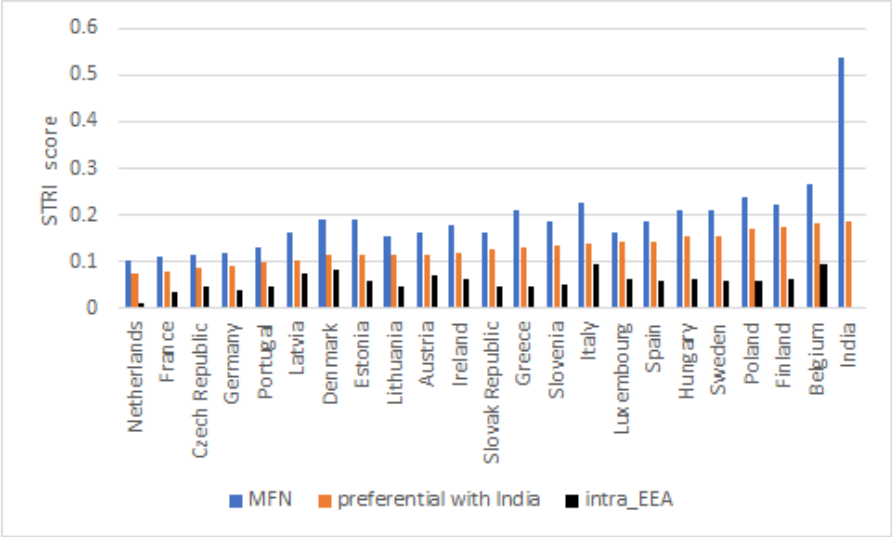
2.3 Delivery services

Delivery services are defined as courier, express delivery and postal services in the FTA, which corresponds to courier services in the STRI. The FTA provisions relate to the competitive interface between postal services and courier and express delivery services. First, universal services obligations should be administered in a non-discriminatory manner. Second, the postal services should not be allowed to cross-subsidize its activities. Third, postal services should face the same market conditions as private courier and express delivery services. Finally, there should be an

[11] Also India, and other federal countries in general, have fragmented services markets and province or state-specific regulation.

independent, properly funded and resourced regulatory body overseeing the sector. The latter is non-discriminatory by nature and would also benefit third countries.

Figure 3: STRI actual MFN, intra-EEA and counterfactual, delivery services, 2021



Notes: The figure shows the MFN STRI score, the intra-EEA score, and the counterfactual when the STRI measures are replaced with the provisions in EU's proposed text for the EU-India FTA.

Following the implementation of the postal directive, EU countries already largely fulfil the obligations set out in the delivery services articles in the FTA. Remaining barriers are therefore in the horizontal areas of movement of people, data flows, public procurement and restrictions on branches in some EU countries. The largest change in actual policy is observed in India and stems from the implication that India would need to deregulate postal services following the implementation of the agreement as it stands. The postal monopoly on letters below 50 grams would have to be eliminated, a measure that alone would reduce India's courier services STRI score from 0.538 to 0.306. Furthermore, this change would also apply to India's MFN STRI score in courier services. The preference margin of the FTA in this sector is on average about six basis points, while the FTA would reduce the average MFN STRI by about two basis points.

2.4 Maritime transport

The maritime transport section covers international transport, and thus excludes cabotage.[12] The text of the EU- India FTA refers to "ships flying the flag of the other Party" or "operated by services suppliers from the other Party". A complicating factor is that more than 70% of the global international fleet is registered in a different country than the nationality of the beneficiary ship owners, and the routes that the ships serve are unrelated to where the ship is registered or where the owners reside.[13] The text proposal appears to cover ships under so-called convenience flag as long as they are operated by services suppliers residing in a Party to the agreement. The agreement does not explicitly deal with the linkage between nationality and residency of shipowners and the right to register a ship under the national flag, which in turn is typically required for access to the cabotage market.

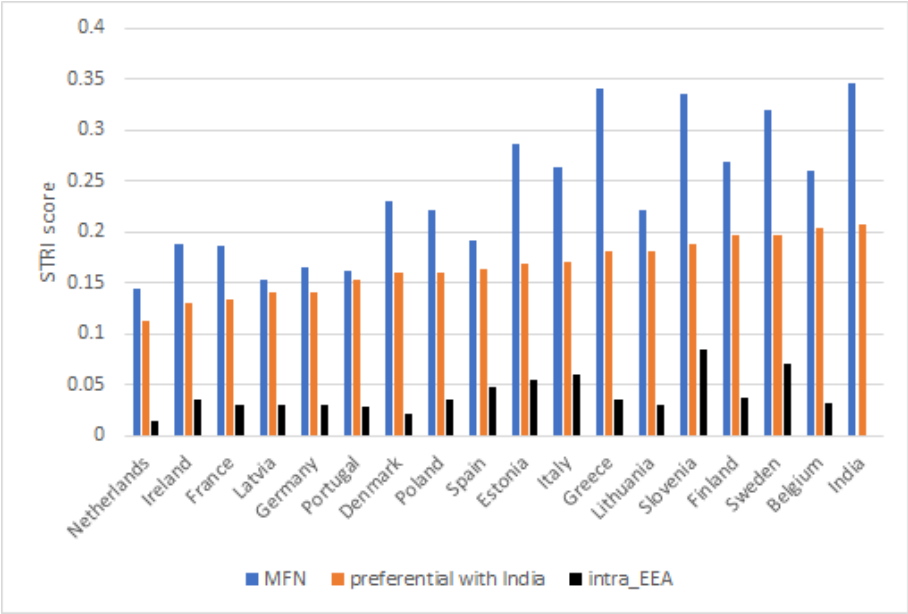
The agreement mainly deals with non-discrimination in access to ports, port services and other auxiliary services. According to the STRI database, such discrimination is not uncommon, but the

[12] Feedering and repositioning of empty containers are not considered cabotage in the FTA text and are thus covered.

[13] See The Geography of Transport Systems

major barriers to trade and investment in maritime transport services are related to registering a ship in the national ship register, access to cabotage, residency requirements of board members and senior management as well as discrimination in relation to taxes and subsidies. These areas appear not to be on the table in the India-EU FTA, which explains the relatively high level of restrictiveness also after the implementation of the FTA as depicted in Figure 4.

Figure 4: STRI actual MFN, intra-EEA and counterfactual, Maritime transport, 2021



Notes: The figure shows the MFN STRI score, the intra-EEA score, and the counterfactual when the STRI measures are replaced with the provisions in EU's proposed text for the EU-India FTA. Note that land-locked countries are not covered in the maritime transport STRI database.

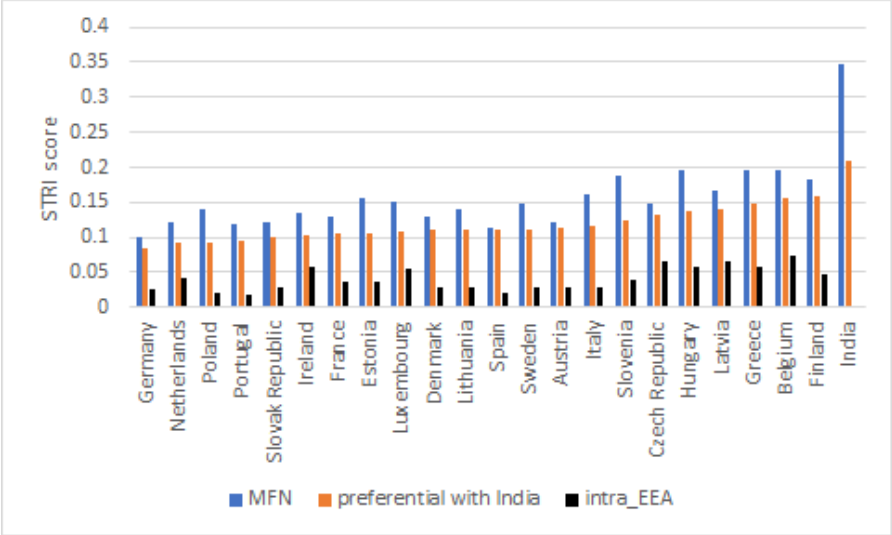
Surprisingly, bearing in mind that Greece is one of the most important shipping nations in the world, it is the most restrictive EU country in this sector. It is the only country that imposes foreign equity limitations in international shipping. It requires local presence for cross-border supply and a host of obligations to use local port services as well as discriminatory port tariffs. These are measures covered by the agreement, and India will experience the largest preference margin in this country. Also India maintains a host of measures that would need to change in the event of an agreement. Among these are restrictions on mergers and acquisitions, cargo reservation schemes for domestic services suppliers and various discriminatory measures related to port and other auxiliary services would have to change for the benefit of EU services suppliers. The preference margin following the implementation of the FTA for maritime services would be about seven basis points on average (from 0.24 to 0.17).

2.5 Telecommunications

In addition to the horizontal measures on market access and national treatment, the telecommunications chapter in the proposed agreement has sector-specific provisions on domestic regulation, inspired by the telecoms reference paper in the GATS as well as the discussions in the JSI on ecommmerce. These include a requirement to have an independent and sufficiently funded and resourced regulator, pro-competitive regulation that imposes obligations on a dominant supplier and number portability for both fixed and mobile lines. These provisions would benefit both domestic and foreign telecoms suppliers alike.

The preference margin for India in the EU is quite low also for this sector where the main

Figure 5: STRI actual MFN, intra-EEA and counterfactual, Telecommunications, 2021



Notes: The figure shows the MFN STRI score, the intra-EEA score, and the counterfactual when the STRI measures are replaced with the provisions in EU's proposed text for the EU-India FTA.

contribution to the margin is easing of barriers to movement of people. Some EU countries maintain commercial presence or local presence requirement for third countries. These would be lifted for India when the agreement enters into force. The provisions on domestic regulation in the proposed agreement are not at a level of detail that would change any of the EU countries' market regulation, although non-discrimination in universal services and transparency related to license agreements would need to be introduced in a few EU countries. Sector-specific regulations in India that have been changed in the counterfactual STRI are nationality requirement for board of directors, number portability for fixed lines and autonomy for the telecoms regulator.

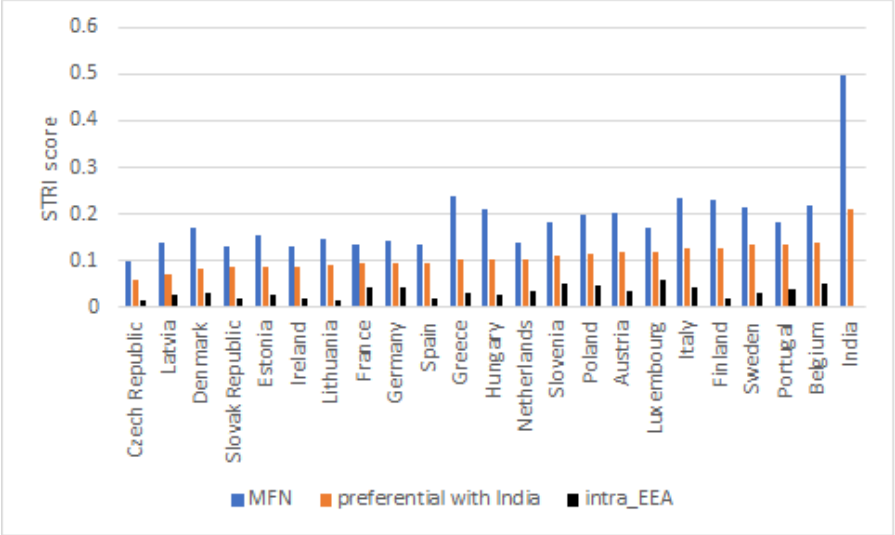
Other contributions to the STRI for telecommunications are horizontal measures on temporary movement of natural persons, access to the public procurement market and data localization requirements to mention the most important. The preference margin would be on average four basis points in this sector (from 0.16 to 0.12).

2.6 Financial services

Financial services consist of insurance services, commercial banking, payment services and financial asset management and trading. The FTA text does not address financial services regulation other than the adoption of international standards. I therefore assume that the general provisions in the chapter on services and investment as well as the transparency chapter applies to financial services, unless otherwise stated.

Sector-specific market access issues that have been changed in the preferential indices are discriminatory criteria to obtain a license, commercial or local presence requirements for cross-border supply, restrictions on branches, nationality requirement for board members and restrictions on cross-border M&A to mention the most common. The major market access barrier in India is a foreign equity limit of 49%, which can be raised to 74% with government approval. These are assumed eliminated for EU services providers. With these counterfactual changes, the average preference margin would be eight basis points.

Figure 6: STRI actual MFN, intra-EEA and counterfactual, Financial services 2021



Notes: The figure shows the MFN STRI score, the intra-EEA score, and the counterfactual when the STRI measures are replaced with the provisions in EU's proposed text for the EU-India FTA. The chart shows simple average of commercial banking and insurance, which are two distinct sectors in the STRI, but covered by the same chapter in the proposed FTA.

2.7 Digital STRI

The STRI suite also includes the digital STRI (DSTRI) (Ferencz 2019). It extracts measures that apply to or directly affect digital trade and data flows across all sectors and has five policy areas: i) infrastructure, which captures pro-competitive regulation in telecommunications and restrictions on cross-border data flows, ii) electronic transactions, which cover recognition of e-signature and electronic contracts, iii) payment systems, which cover non-discriminatory access to electronic payment systems, iv) intellectual property rights and v) other, which captures restrictions on advertising and local and commercial presence requirements for cross-border services trade.

Many of the measures in the DSTRI are not covered by the EU-India FTA draft text, or covered in terms of best endeavor clauses and similar language. The ones that are covered and changed in the counterfactual STRI are data localization requirements, the prohibition of cross-border data flows, discrimination related to licenses, access to payment systems, intellectual property right protection. Performance requirements and commercial or local presence requirements in digital services markets are also covered.[14]

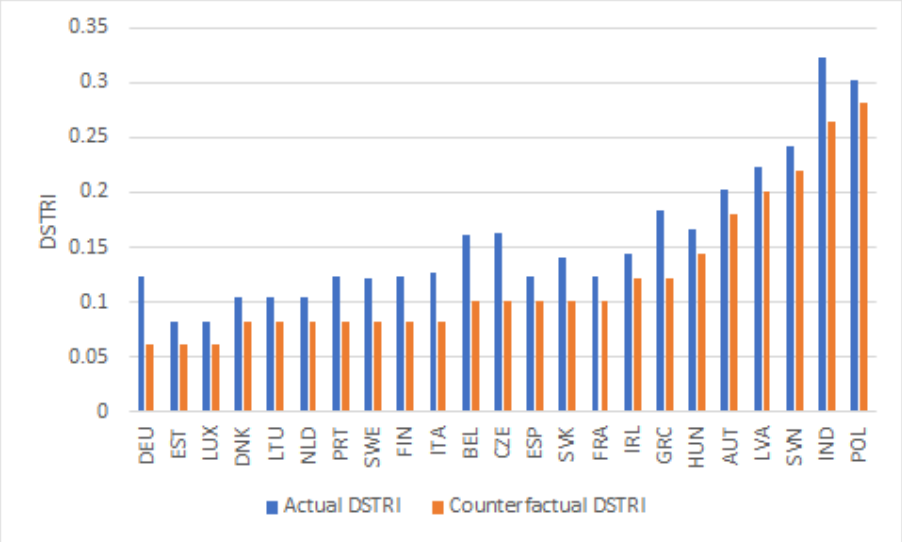
The counterfactual DSTRs are displayed together with the actuals for 2021 in figure 8. An EU-wide localization requirement for using the .eu domain is recorded in all the EU countries. In Germany, Belgium, the Czech republic and Greece there is also a data localization requirement for certain data. The agreement would, if implemented as is, reduce the average DSTRI by about three basis points, from 0.156 to 0.122.

3 Data

Trade data are from the WTO experimental data set that covers bilateral trade in 12 sectors and 200 countries for the period 2005-2019. It is a balanced and complete set, reflecting the work that has gone into putting together information from numerous sources and estimating the missing cells in the bilateral trade matrix (Liberatore and Wettstein 2021). The bilateral trade data do, however,

[14]Most of these are also captured in the sector-specific STRIs presented above.

Figure 7: Digital STRI actual MFN, and counterfactual, 2021



Notes: The figure shows the MFN STRI score and the counterfactual when the STRI measures are replaced with the provisions in EU's proposed text for the EU-India FTA. Intra-EEA indices are not available for the DSTRI.

not include internal trade. Information on these has been obtained from the OECD/WTO trade in value added (TiVA) database, which contains information on gross output and exports by country, sector and year during the period 1995-2018 for 66 countries and 45 industries. From this database I compute internal trade for the years 2005 to 2018 by subtracting exports from gross output for each sector, country and year.

Trade data are recorded according to the Extended Balance of Payment Services (EBOPS) classification, while the TiVA database applies the International Standard Industrial Classification (ISIC rev 4). The latter presents data at a detailed sector break-down, but the information on gross output is nevertheless available only at an aggregate sector level. Combining the two data sets yields bilateral trade - including internal trade - for the period 2005-2018 for four services sectors: construction, communications services, financial services, and other business services. See the concordance in Table 1.

Table 1: Concordance EBOPS and ISIC rev 4

Sector	EBOPS	ISIC rev 4
Construction	SE	D41T43
Communication services	SI	D58T63
Financial services	SF+SG	D64T66
Other business services	SJ	D68T82

Sources: WTO-OECD Balanced Trade in Services Dataset (BaTiS) — BPM6 and Trade in Value Added (TiVA) 2021 edition.

The standard gravity variables including distance, contiguity, common language and FTAs by type and coverage are from CEPII (Conte et al. 2022), which covers all countries in the world for the period 1948-2020.

Finally, information on services trade barriers is from the OECD STRI database. It contains annual data on a set of trade policy measures for 22 services sectors and 50 countries for the period 2014-2021. It records factual information on trade-related policies in force with reference and links to the legal sources. This information is scored and weighted to create composite indexes that take values between zero (fully open) and one (completely closed). The STRI database records polices that apply on an MFN basis and thus does not capture preferences in FTAs. However,

the European Economic Area is an exemption and the STRI suite of tools includes an intra-EEA regulatory database which is used here to develop the counterfactual bilateral STRIs.

Combining these four data sets yields a panel of 66 countries over 19 years for the analysis using the FTA dummy as the explanatory variable of interest and a panel of 50 countries over five years for the analysis using the STRI as the explanatory variable. Descriptive statistics are provided in the appendix.

4 Analytical approach

To study the impact of the proposed FTA between EU and India I apply a standard general equilibrium structural gravity analysis building on Anderson, Larch, et al. 2018. The model consists of the following four equations:

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

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

$$\Pi_i^{1-\sigma} = \Sigma_j \left(\frac{t_{ij}}{P_j}\right)^{(1-\sigma)} E_j \tag{3}$$

$$p_j = \frac{Y_j^{\frac{1}{1-\sigma}}}{\gamma_j \Pi_j} \tag{4}$$

X_{ij} represents exports from country i to country j. Bilateral trade costs are captured by t_{ij} while Y_i and E_j denote output in the exporting country and expenditure in the importing country respectively. Π_i and P_j are price indices which are weighted CES aggregates of the bilateral trade costs with all other trading partners and are referred to as the outward and inward multilateral resistance (MR) respectively. These play an important role in the gravity model and reflect that bilateral trade is determined by *relative* trade costs. The Armington elasticity of substitution between services from different origins is denoted σ. The first three equations constitute the structural gravity model, while the fourth closes the general equilibrium model by equating global supply and demand, where γ_j is a distribution parameter for the underlying CES utility function.[15]

From the structural gravity model I derive the following regression equation:

$$X_{ij,t} = exp\left[\alpha_0 + \alpha_1 t_{ij,t} + \nu_{i,t} + \lambda_{j,t} + \delta_{ij}\right] + \epsilon_{ij,t} \tag{5}$$

where $\nu_{i,t}$ and $\lambda_{j,t}$ represent country-year fixed effects for exporters and importers respectively, δ_{ij} depicts country pair fixed effects and $\epsilon_{ij,t}$ is an error term. Time varying bilateral trade costs in the regressions are free-trade agreements and the bilateral STRIs. The regression equation follows the now standard practice of estimating gravity using the Pseudo Poisson Maximum Likelihood (PPML) estimator (Silva and Tenreyro 2006). As we will see, in short panels using the STRI as the explanatory variable, the pair fixed effects in some cases absorb all the variation and the explanatory variable of interest cannot be estimated precisely. In such cases I omit country pair fixed effects and include time invariant bilateral trade costs including common border, common language and a dummy that takes the value 1 if $i \neq j$ and zero otherwise. The regression equation

[15] It is possible to introduce trade deficits and surpluses into the model be adding a wedge between supply and demand.

is estimated on total services trade and services trade by broad sector as described in Table 1 using the FTA and the bilateral STRIs as explanatory variables.

The next step is to construct counterfactual scenarios. The first scenario changes the FTA dummy, from FTA = 0 to FTA = 1 if exporter or importer is a member of the European Union and the trading parter is India. The bilateral counterfactual STRIs are derived from the data presented in Section 2 (Table 2).

Table 2: Bilateral STRI

Reporter	Partner	reporter = partner	STRI
EEA	EEA	no	intra-EEA STRI
EU	India	no	preferential STRI
India	EU	no	preferential STRI
EU	third country	no	importer STRI (MFN)
Third country	EU	no	importer STRI (MFN)
Third country	Third country	no	importer STRI (MFN)
Any country	Any country	yes	importer STRI, Barriers to competition

The counterfactual experiments are done in two steps, following Anderson, Larch, et al. 2018 closely. First, I estimate the fixed effects gravity equation on a cross-section of data for the latest year available, which is 2018. The explanatory variables are the FTA dummy or the bilateral STRIs and controlling for the log of distance, common border, and whether external trade. I use the estimated parameters on the exporter and importer fixed effects to construct the baseline MRs. As is well known, equations 2 and 3 solve for the multilateral resistance terms up to a scalar, and we must therefore normalize to obtain a solution. I use the US as the benchmark for normalizing following recommendations to pick a large country that is not overly affected by the policy shock to be studied. I next construct baseline general equilibrium indexes from the fixed effects and data on Y_i and E_j using equations 2 and 3. The second step is to estimate conditional gravity:

$$X_{ij} = exp\left[\hat{\alpha} t_{ij}^{c} + \nu_i^{c} + \lambda_j^{c}\right] + \epsilon_{ij}^{c} \tag{6}$$

where superscript c symbolizes counterfactual variables. The coefficients α are constrained to those estimated for the baseline, while bilateral export data are the same as in the first regression. This step thus estimates the MRs from the counterfactual trade costs that are consistent with the observed trade flows, expenditure and output levels. The MRs are computed as follows:

$$\widehat{P_j} = \frac{E_j}{E_0} exp(-\hat{\lambda_j}) \tag{7}$$

$$\widehat{\Pi_i} = E_0 Y_i exp(-\hat{\nu_i}) \tag{8}$$

where E_0 is expenditure in the numeraire country, the US. Using these results, counterfactual bilateral trade flows are predicted. At this step, total output and expenditure remain the same, but relative trade costs captured directly and indirectly through the re-estimated MRs redistribute global output across trading partners. Finally, the full general equilibrium trade effect allowing total expenditure and total output to adjust as a consequence of changing relative prices are constructed as follows:

$$X_{ij}^{c} = \frac{\left(t_{ij}^{1-\sigma}\right)^{c} Y_i^{c} E_j^{c}}{t_{ij}^{1-\sigma} Y_i E_j} \frac{\Pi_i^{1-\sigma} P_j^{1-\sigma}}{\left(\Pi_i^{1-\sigma}\right)^{c} \left(P_j^{1-\sigma}\right)^{c}} X_{ij} \tag{9}$$

Table 3: Services trade and FTAs, structural gravity

	(1) M	(2) trade	(3) trade
FTA	0.228**	0.285**	0.0240
	(2.68)	(2.70)	(1.35)
Both_EU	0.157	0.592***	0.151**
	(1.24)	(5.91)	(3.05)
ln distance	-0.493***	-0.201***	
	(-17.33)	(-4.21)	
Common language	0.451***	1.014***	
	(6.19)	(9.82)	
Contiguous	0.276**	0.441**	
	(2.96)	(3.12)	
Border		-6.388***	
		(-38.55)	
N	58240	59150	59150
Pseudo R^2	0.935	0.996	1.000
Pair fixed effects	No	No	Yes

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes: Robust standard errors are clustered on country pairs. All regressions include country-year fixed effects.

5 Results

5.1 Structural gravity regressions

I start with standard gravity regressions on bilateral services trade to verify that structural gravity applies to my data, reported in Table 3. The first column shows the PPML regression with standard gravity variables. We notice that intra-EU trade is not significantly different from trade within other FTAs. However, EU and FTAs may not only divert trade from other trading partners. They may also divert domestic sales to external trade. If so, the coefficient on both-EU and FTA would underestimate their impact on trade. This is clearly the case for services trade. When adding internal trade (column 2) the both-EU dummy becomes highly significant and the impact is rather large. The coefficient implies that intra-EU services trade is about 80% larger than extra-EU trade and trade between non-EU countries, all else equal. Note that this effect comes on top of the impact of an FTA, since EU is also considered an FTA in the CEPII gravity database. Being part of an FTA that includes both goods and services raises services trade by about a third on average.[16] The most striking result is the huge border effect as captured by the dummy named External, which takes the value 1 if the trade flow is between two countries and zero if trade is within a country. The coefficient suggests that trade with an average trading partner is only about 0.3% of internal trade. Summing over all trading partners, the actual export share of total sales is about 13% on average. We finally notice in the third column that when including the full set of fixed effects, these absorb the variation in FTAs, but both-EU is still statistically significant at a one percent level.

We use the estimates in column 2 as the basis for a first counterfactual analysis of the possible impact of a free trade agreement between India and the EU. But first, let us confirm that the bilateral STRIs are robustly and significantly related to services trade flows. The services specifically addressed in the FTA text are essential inputs for trading most services. One would therefore expect them to affect trade not only in the sectors to which they apply directly, but also

[16] Both-EU and FTA are dummy variables. The trade effect of moving from 0 to 1 is the exponential of the coefficient less one.

to services in general. Besides, many of the measures captured by the STRIs apply horizontally to all sectors. This is for instance the case for most restrictions on movement of natural persons, public procurement as well as regulatory transparency.

To assess the importance of openness to trade in the trade-enabling services specifically addressed in the FTA text, I regress bilateral total services trade on the STRIs for these sectors. The sample is now limited to the 50 countries covered by the STRI and the period 2014-2018. To identify the impact of country-specific services trade restrictions while controlling for country-time fixed effects, I split the STRI indices in two parts, STRI-internal, which covers barriers to competition only, and STRI external which adds restrictions on foreign entry, restrictions to the movement of people, other discriminatory measures and regulatory transparency.[17] The results are reported in Table 4. One could argue that the STRIs should be weighted by the sectors' importance for total services trade, for instance by their share of intermediate inputs in services or the sector share of total services trade or output. However, bearing in mind that telecommunications, for instance, constitute a modest share of services output, trade, and intermediate inputs, and yet, without telecommunications cross-border trade in services would in many cases not be possible at all, it is the quality, cost and availability of the service rather than its cost share that matter.[18]

[17] Administrative transparency contains measures related to procedures and cost of obtaining a visa and thus apply mostly to foreign services suppliers.

[18] Robustness checks using input share weights will be added to the appendix.

Table 4: Structural gravity, total services, STRI

	(1) FTA only	(2) CR	(3) CS	(4) FS BNK	(5) FS INS	(6) TC	(7) TR MAR
Ln distance	-0.312***	-0.278***	-0.284***	-0.294***	-0.300***	-0.275***	-0.259***
	(-7.52)	(-6.22)	(-6.44)	(-7.22)	(-7.37)	(-6.33)	(-6.38)
Contiguous	0.184	0.233*	0.213	0.190	0.232*	0.123	0.227*
	(1.75)	(2.25)	(1.94)	(1.75)	(2.45)	(1.03)	(2.04)
Common language	0.892***	0.856***	0.876***	0.898***	0.846***	0.858***	0.910***
	(8.11)	(7.87)	(7.65)	(7.69)	(8.74)	(6.37)	(7.82)
External	-5.135***	-4.931***	-5.194***	-5.286***	-4.554***	-5.598***	-6.042***
	(-23.15)	(-17.74)	(-20.95)	(-25.46)	(-19.56)	(-23.87)	(-42.87)
FTA	0.140	0.0729	0.106	0.0948	0.203*	0.148	0.122
	(1.51)	(0.75)	(1.09)	(1.00)	(2.28)	(1.47)	(1.29)
Both EU	0.357**	0.648***	0.521***	0.591***	0.226*	0.743***	0.786***
	(3.13)	(6.41)	(4.95)	(6.52)	(2.25)	(8.16)	(9.17)
STRI		-3.001***	-5.244***	-3.806***	-3.023***	-9.038***	-1.638**
		(-5.21)	(-5.88)	(-5.36)	(-5.67)	(-8.35)	(-2.82)
Pseudo R^2	0.996	0.996	0.996	0.996	0.996	0.997	0.997
N	14950	14950	14950	14950	14950	13156	14950

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes Robust standard errors are clustered on country pairs. All regressions are with country-year fixed effects. The STRI coefficients reported in the last row are for the sector indicated in the column heading: Courier services (CR), computer services (CS), commercial banking (FS BNK), insurance (FS INS), telecommunications (TC) and maritime transport (TR MAR).

As expected, restrictions on trade in all these essential enabling services have a large and negative effect on overall trade in services. The largest impact comes from telecommunications, which constitute the backbone of cross-border digital trade. A one standard deviation rise in the STRI for telecommunications (15 basis points) is associated with a 75% drop in bilateral trade. Also trade restrictions in financial services, particularly banking, are strongly associated with overall trade in services. The appendix report the results for regressions by each broad sector included in Table 1. Here the sector-specific STRIs are included as the explanatory variable, together with the STRI for telecommunications, since cross-border trade largely takes place over digital networks. The sectoral regressions confirm and reinforces the importance of telecommunications for services trade. In all sectors trade and regulatory barriers in telecommunications dwarf restriction in the sector itself.

Finally, I ran regressions with the DSTRI as the explanatory variable. It is available for 74 countries, including a number of developing countries (Annex table A3). Also this indicator is significantly and negatively associated services trade. However, the coefficient is a lot smaller than that for telecommunications, suggesting that market access is more important than pro-competitive regulation. This may also reflect the changing market structure of telecommunications, facing more competition from internet services as discussed above.

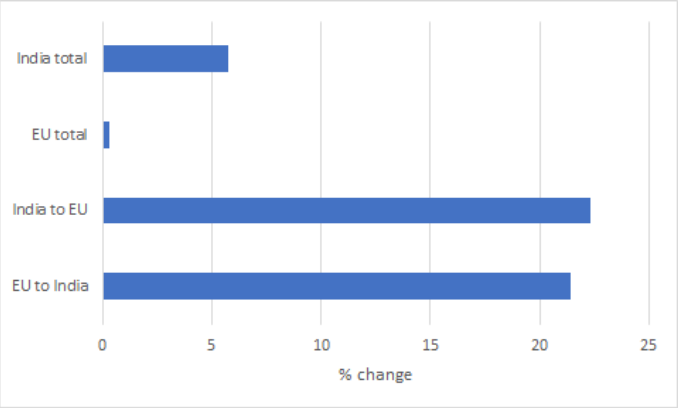
5.2 Counterfactual scenarios

5.2.1 FTA dummy

The full general equilibrium effect of the proposed India-EU FTA on services trade, expenditure and outputs is first estimated using the FTA dummy as the explanatory variable. I follow the steps suggested by Anderson, Larch, et al. 2018, based on the specification reported in column (2) in Table 3. As explained in section four, I run the gravity regression on a cross-section of data

from 2018, the latest year for which a full set of data is available. Next, I create a counterfactual scenario where the FTA dummy is changed from zero to one if the exporter or importer is an EU country exporting to or importing from India and compute full general equilibrium counterfactual trade flows. The results are depicted in Figure 8. Global services trade hardly changed at all due to the EU-India FTA.[19] Thus, the impact of the FTA is a reallocation of global output from other trading partners, including other FTA partners and intra-EU services trade.[20] The agreement is, however predicted to be net trade creating for India and to a lesser extent also for EU. The FTA is also predicted to raise real services output, but only by 0.05% in India and 0.005% in the EU. Since services trade between EU and India is relatively small at the outset, a large increase in trade between them following the FTA is compatible with a small overall increase in services trade.

Figure 8: Full general equilibrium impact of the EU-India FTA on services trade



Notes: The figure shows the outcome of a full general equilibrium simulation where the counterfactual is the EU-India FTA as captured by the FTA dummy. Note that the multilateral resistance terms play an important role in transmitting the shock from the EU-India FTA throughout the world, and they are normalized such that $P_{USA} = 1$

The simulations using the FTA dummy capture the impact of FTAs on average, all else equal. The next section presents the results of simulations using the counterfactual STRIs presented in Section 3. As noted, these are directional allowing for $t_{ij} \neq t_{ji}$ and $t_{ii} > 1$.

5.2.2 Bilateral STRIs

The general equilibrium simulations of the impact of the EU-India FTA has been performed both at the aggregate services level and for the two sectors for which STRI data, internal trade data and bilateral trade data can be matched, i.e., financial services and communications services (see Table 1).[21] The full general equilibrium results are reported in Table 5. The impact is much larger than when using the FTA dummy. The reason is that while the average FTA merely binds existing applied regulatory and market access measures, the counterfactual STRIs captured EU-India specific market access and regulatory changes entailed in the draft FTA text.

The results also reflect the fact that the bilateral STRIs are directional and, since India with few exceptions has the highest barriers to trade in services on an MFN basis, the impact on services imports is largest in India. However the share of India's exports currently going to the EU is almost an order of magnitude larger than the share of EU exports going to India (Figure 1). Therefore, more than 50% export growth affecting a third of Indian services exports accounts for more in

[19] The simulations produced an increase in global services trade of 0.0009%.

[20] See Dai et al. 2014 for similar results for goods trade

[21] For construction, a perfect match between internal trade, external trade and the STRI measures is possible. However, trade in construction services between EU and India is minuscule and such analysis is therefore not very meaningful.

Table 5: Full general equilibrium, impact of EU-India FTA

	All (1)	Financial (2)	Communications (3)	All with Brexit (4)
Total exports, EU	1.18	0.46	0.28	-10.95
Total exports, India	25.09	5.57	3.48	25.07
Exports from EU to India	114.47	179.74	97.15	91.94
Exports from India to EU	51.18	19.20	9.96	36.72
Intra-EU trade	0.02	-0.26	-0.13	-19.28
India's exports to third countries	-2.82	-0.81	-0.61	-2.66
India's imports from third countries	-3.38	-0.81	-0.73	-3.14
Real output, EU	0.01	0.01	0.01	-17.78
Real output, India	0.21	0.16	0.11	0.21

Notes: The table reports % changes compared to the baseline for total services (column 1), financial services (column 2), communications services (column 3), and total services with Brexit (column 4). Explanatory variables are bilateral, directional STRIs for the services sector indicated by the column head. In the Brexit scenario, the UK is part of EU in the baseline figures, but not in the counterfactual.

total exports growth than a doubling of exports that accounted for only about 2% of EU's total exports before the FTA.

The largest effect of the FTA is on exports of financial services from EU to India. Currently, trade flows in this sector are muted due to a very restrictive trade policy regime (Figure 8). Should the provisions in the draft FTA text come to bear, the preference margin for EU exports to India will be about 30 basis points, which explains the large increase in trade.

We note that the impact of the FTA on trade in communications services, which include computer services, telecommunications and other communications services, is relatively small. The reason for this is that the sector (other than telecommunications) is relatively open on an MFN basis and also a sector where India is a mature exporter.

Finally, we note that when the full general equilibrium effects have worked their way through the economy, total real output in the services sectors have not changed much, particularly not in the EU. The main effect is thus trade creation in the sense that some of the services outputs that were previously sold on the domestic market are exported and replaced by imports. Trade diversion from other countries is also observed. Details for all 50 countries included in the simulations are reported in the appendix.

5.2.3 Brexit

The simulations are run on data for 2018 when the UK was still a member of the European Union. Obviously, at the time when the EU-India FTA enters into force, the UK is no longer a member of the EU. Taking Brexit into account in the simulations is a challenge since we do not have post-Brexit trade data and parameter estimates. The Brexit scenario thus runs the baseline where the UK is a member of the EU.

In the counterfactual scenario, the UK is not part of the EU and not party to the EU-India FTA. The bilateral STRI is thus changed to MFN values for country pairs where one is an EU member and the other is the UK while MFN STRIs also applies to UK - India trade flows. The results for total services trade are reported in the last column in Table 5. Note that in this scenario the counterfactual is *both* Brexit and an FTA between the EU 27 and India.

The decline in EU real services output and intra-EU trade is mainly due to the exclusion of services output from the UK. Obviously, a trade agreement between the E27 generates a smaller change in services trade between the Parties, than an agreement with EU28. However, the overall impact on India's services trade and services output is about the same with Brexit as without Brexit. The reason for this is that the UK's MFN barriers to services trade are among the lowest in the EU. While the UK's total services trade will decline by 10%, trade with India is predicted

to increase, as trade is diverted from intra-EU trade to trade with third countries.

6 Concluding remarks

This paper provides an empirical assessment of the potential impact of the proposed FTA between EU and India, if implemented as the draft text suggests. Although the final text will likely be quite different from the draft, it offers a useful benchmark towards which reservations and exemptions can be measured. The methodology can also be applied to other FTAs.

The crucial importance of telecommunications for cross-border services trade is worth noticing. This should not be surprising since telecommunications lie at the heart of the digital economy and provide the underlying transport means for cross border services trade. Previous research has documented the importance of open and well-regulated telecommunications markets for telecommunications density and the uptake of broadband (Kyvik Nordås and Rouzet 2017; Kyvik Nordas 2020). What is surprising, however, is that telecommunications restrictions appear to be so much more important than the measures captured by the DSTRI. This raises two points for further analysis and policy implmenetation. First, trade governance in the digital economy still needs to focus on the basics of market access in telecommunications. Second, what constitutes a best-practice pro-competitive telecommunications regulation is conditional on market structure as well as technology. FTAs, particularly between countries at different levels of development, should therefore cooperate on the principles as well as forward-looking regulation in areas such as competition, privacy and security rather than pinning down the specifics of pro-competitive regulation.

As always when conducting empirical analysis of services trade, the availability of data imposes limitations on identification strategies. Thus, trade data are to some extent created using gravity which raises endogeneity problems when using gravity for policy analysis. Inadequate data should not prevent us from doing rigorous analysis of services trade and services trade governance, although caution is needed in interpreting the results and drawing policy implications. Thus, the simulations presented here are indicative showing the direction and order of magnitude of changes.

Another limitation is that the data do not cover affiliate sales, or mode 3 if you will. The FTA chapter on services is labelled "Services and Investment" and the counterfactual STRIs also capture changes in policies related to mode 3. However, bilateral FTA and affiliate sales data in services are patchy and full of gaps and not suitable for structural gravity econometric analysis of the EU-India FTA. Trade and affiliate sales may in some cases be substitutes and in other complements (Sleuwaegen and Smith 2021; Kyvik Nordås, Lodefalk, et al. n.d.), so it is clearly desirable to run simultaneous regressions for trade and affiliate sales where possible.

The Parties to the EU-India FTA have common objectives to lead the digital transition in an inclusive and sustainable manner while safeguarding privacy, security and competition. The draft text emphasizes principles and guidelines for domestic regulation while giving policy space for specific solution that are suitable for each Party and which may evolve over time with changing technology and market conditions.

As the appetite for deep agreements that limit the policy space in key areas of domestic regulation, seems to be meagre, the depth of the EU-India agreement may be appropriate for other agreements, not least between developing and developed countries. Following and drawing lessons from the negotiations and the implementation of the EU-India FTA will therefore be important for the future of global trade governance against a backdrop of rising protectionism. Going forward, more work is needed to study the relationship between trade policy and the digital transition in detail. Such analysis will also inform the work in the EU-India Trade and Technology Council.

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Appendix

Table A1: Descriptive statistics

Variable	Observations	Mean	Std. Dev	Min	Max
Bilateral trade (USD mill)					
Total services	548662	109.94	1116.87	0	79244.85
Construction	548662	2.21	22.92	0	2832.25
Communication services	548662	7.95	102.83	0	13885.99
Financial services	548662	5.74	133.05	0	22611.07
Other business services	548662	23.80	292.33	0.00	37847.42
Internal trade					
Total services	938	1115898	2844385	3007.6	26900000
Construction	938	139189.8	316724.4	631	3374819
Communication services	938	75087.79	213399.3	127.4	2138036
Financial services	938	92865.28	275555.6	75.7	2834151
Other business services	938	126289.8	363729.8	60.9	3608655
Gravity variables					
Distance (km)	14950	6934.63	5072.38	9.56	19772.34
Contiguity	14950	0.05	0.21	0	1
Common language	14950	0.07	0.25	0	1
Border	14950	0.98	0.13	0	1
Both EU	14950	0.20	0.40	0	1
FTA	14950	0.43	0.49	0	1
MFN STRI					
Computer services	300	0.22	0.07	0.09	0.45
Courier services	300	0.29	0.16	0.10	1
Commercial banking	300	0.23	0.10	0.08	0.49
Insurance	300	0.23	0.11	0.09	0.58
Maritime transport	264	0.27	0.09	0.14	0.55
Telecommunications	300	0.24	0.15	0.09	0.72
Bilateral STRI					
Computer services	14950	0.21	0.07	0	0.45
Courier services	14950	0.29	0.16	0.01	1
Commercial banking	14950	0.23	0.10	0	0.49
Insurance	14950	0.23	0.11	0	0.58
Maritime transport	13156	0.27	0.09	0.01	0.55
Telecommunications	14950	0.24	0.15	0.01	0.72

Notes: Number of observations show unique observations. STRI for maritime transport is missing for landlocked countries.

Table A2: Structural gravity total services with digital STRI

	(1)
	trade
Ln distance	-0.190***
	(-3.77)
Contiguous	0.445***
	(3.31)
Common language	0.865***
	(8.18)
External	-5.836***
	(-22.62)
FTA	0.186
	(1.68)
Both EU	0.655***
	(6.10)
Digital STRI	-2.722***
	(-3.75)
pseudo R^2	0.996
N	31816

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes Robust standard errors are clustered on country pairs. Country-year fixed effects are included.

Table A3: Structural gravity financial services with STRI

	(1)	(2)	(3)	(4)	(5)
Ln distance	-0.252**	-0.327***	-0.313***	-0.318***	-0.322***
	(-3.16)	(-4.23)	(-4.09)	(-4.35)	(-4.42)
Contiguous	-0.163	-0.273	-0.277	-0.141	-0.153
	(-0.64)	(-1.15)	(-1.12)	(-0.75)	(-0.80)
Common language	1.356***	1.310***	1.361***	1.253***	1.255***
	(6.13)	(6.54)	(6.27)	(8.84)	(8.83)
External	-5.939***	-3.611***	-4.493***	-2.802***	-2.725***
	(-22.02)	(-8.39)	(-12.07)	(-7.55)	(-7.00)
FTA	-0.154	-0.221	-0.214	0.0679	0.0560
	(-0.95)	(-1.38)	(-1.34)	(0.53)	(0.43)
Both EU	1.378***	0.742***	1.032***	0.281	0.267
	(8.65)	(5.10)	(6.35)	(1.69)	(1.66)
STRI FSBNK		-10.96***			-1.016
		(-8.52)			(-0.60)
STRI FSINS			-5.980***		
			(-6.70)		
STRI TC				-20.87***	-19.97***
				(-12.29)	(-8.40)
Pseudo R^2	0.992	0.993	0.992	0.994	0.994
N	14950	14950	14950	14950	14950

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes Robust standard errors are clustered on country pairs. All regressions are with country-year fixed effects.

Table A4: Structural gravity communications services with STRI

	(1)	(2)	(3)	(4)
Ln distance	-0.347***	-0.356***	-0.380***	-0.379***
	(-7.28)	(-7.30)	(-7.97)	(-8.07)
Contiguous	-0.125	-0.121	-0.109	-0.0995
	(-0.94)	(-0.93)	(-0.88)	(-0.79)
Common language	0.977***	0.945***	0.903***	0.918***
	(8.04)	(7.86)	(7.54)	(7.60)
External	-5.553***	-4.973***	-4.191***	-4.567***
	(-34.58)	(-18.56)	(-15.07)	(-16.79)
FTA	-0.0959	-0.114	0.0111	0.0891
	(-0.82)	(-0.96)	(0.10)	(0.75)
Both EU	1.164***	1.095***	0.650***	0.528***
	(11.35)	(10.59)	(5.23)	(3.87)
STRI CS		-2.803***		5.094***
		(-3.31)		(4.05)
STRI TC			-8.646***	-12.98***
			(-6.25)	(-6.05)
Pseudo R^2	0.994	0.994	0.994	0.994
N	14950	14950	14950	14950

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes Robust standard errors are clustered on country pairs. All regressions are with country-year fixed effects.

Table A5: Structural gravity, other business services STRI

	(1)	(2)	(3)	(4)
Ln distance	-0.202***	-0.183***	-0.246***	-0.254***
	(-3.80)	(-3.42)	(-4.97)	(-5.10)
Contiguous	0.133	0.181	0.148	0.137
	(1.02)	(1.44)	(1.41)	(1.32)
Common language	1.038***	0.951***	0.950***	0.963***
	(7.68)	(7.48)	(9.08)	(9.11)
External	-4.762***	-3.964***	-2.926***	-2.954***
	(-26.62)	(-16.40)	(-11.80)	(-12.01)
FTA	-0.0163	-0.0235	0.130	0.146
	(-0.14)	(-0.19)	(1.14)	(1.29)
Both EU	1.005***	0.972***	0.322**	0.269*
	(10.03)	(8.86)	(2.79)	(2.21)
STRI PS		-3.067***		0.691
		(-6.57)		(1.30)
STRI TC			-11.78***	-12.73***
			(-10.56)	(-9.28)
Pseudo R^2	0.985	0.985	0.987	0.987
N	14950	14950	14950	14950

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note Robust standard errors are clustered on country pairs. All regressions are with country-year fixed effects. STRI PS is the simple average of the STRIs for accounting, architecture, engineering and legal services.

Table A6: Simulations, total services using bilateral STRIs, % change from baseline

Country	Exports	Real output	Country	Exports	Real output
AUS	-0.035	0.000	ITA	1.483	0.014
AUT	1.095	0.026	JPN	-0.038	0.000
BEL	1.078	0.020	KAZ	-0.046	0.000
BRA	-0.027	0.000	KOR	-0.043	0.000
CAN	-0.016	0.000	LTU	1.046	0.080
CHE	0.008	0.000	LUX	1.013	0.035
CHL	-0.023	0.000	LVA	1.057	0.087
CHN	-0.051	0.000	MEX	-0.021	0.000
COL	-0.021	0.000	MYS	-0.037	0.000
CRI	-0.015	-0.001	NLD	1.018	0.014
CZE	1.013	0.031	NOR	-0.020	-0.003
DEU	1.104	0.009	NZL	-0.030	0.000
DNK	1.234	0.027	PER	-0.019	0.000
ESP	1.127	0.013	POL	1.369	0.031
EST	1.186	0.107	PRT	1.183	0.033
FIN	1.273	0.032	RUS	-0.036	0.000
FRA	1.238	0.013	SGP	-0.040	0.000
GBR	1.077	0.006	SVK	1.163	0.057
GRC	1.289	0.042	SVN	1.100	0.079
HUN	1.266	0.052	SWE	1.355	0.025
IDN	-0.037	0.000	THA	-0.037	0.000
IND	25.091	0.207	TUR	-0.019	0.000
IRL	1.316	0.028	USA	-0.016	0.000
ISL	-0.056	-0.013	VNM	-0.049	0.000
ISR	-0.023	0.000	ZAF	-0.027	0.000