



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, it uses the OECD STRI simulator to calculate the preference margins implied by the agreement and next predicts the impact on services trade flows using a general equilibrium structural gravity analysis. I find that the preference margin on the Services Trade Restrictiveness Index (STRI) for Indian exports to the EU is between four and eight basis points depending on the sector, while for EU's exports to India the preference margin is between 10 and 35 basis points. The predicted effect is more than 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 contract 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. About half of the predicted export expansion is driven by reforms to domestic regulation.

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 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 EU and India could be of immense importance for an orderly and inclusive transition to a digital and green economy dominated by services as envisaged in the first meeting of the [Trade and Technology Council](#). 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 while 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 couple of 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 On its part,

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¹ See [joint press release 25.04.2022](#).

² see [The Digital Personal Data Protection Bill](#).

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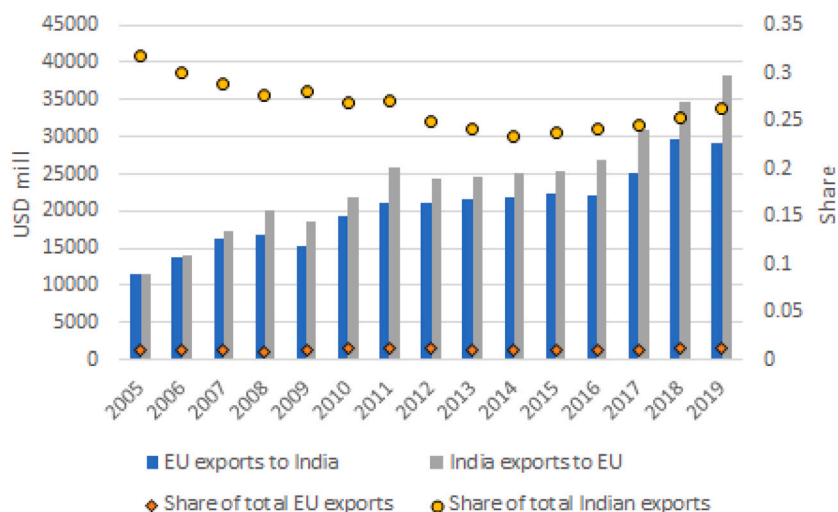


Fig. 1. Services trade between EU and India.
Source: WTO/OECD BATIS.

the EU is in the process of introducing new legislation for the digital economy. The Digital Services Act and the Digital Markets Act are being phased in from 2022 onwards 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.³ The EU-India FTA is an opportunity to explore how development, services trade and cross-border data flows with trust can be reconciled, while the Trade and Technology Council aims at being a vehicle for forward-looking governance.⁴

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 on 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, communication and information services, and barriers facing such trade.

India has followed 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 10th 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 (Fig. 1).

This paper contributes to the literature in three areas. First, it offers a methodology for detailed impact assessment of services chapters in FTAs. Combining granular updated information on applied services trade policy and domestic regulation from the OECD Services Trade Restrictiveness Index (STRI) database with the text of the FTA, I demonstrate how to calculate counterfactual, directional, bilateral trade cost indexes, using the draft text of the EU-India FTA as an example.⁵ The analysis identifies areas where the FTA text would require changes in laws and regulations in each party to the agreement. The methodology thus allows ex ante impact analysis of services chapters in FTAs at a granular level; assessments that are often mandated when countries enter into negotiations over new FTAs.

Second, the paper contributes to the empirical gravity literature analysing the drivers of trade in services, adding to a small body of literature; e.g., Kimura and Lee (2006), Walsh (2008), Anderson et al. (2018a), Benz et al. (2020) and Borchert and Di Ubaldo (2021). 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 $t_{ii} > 1$ and varies across countries. The existing literature that study unilateral policy measures add domestic trade to the gravity

³ The EU published a list of 17 designated very large platforms and two very large search engines, for the purpose of asymmetric regulation for the Digital Services Act. None of them are Indian, only two are headquartered in the EU and two in China. The others are headquartered in the USA.

⁴ See Mattoo and Meltzer (2018) for a discussion on privacy and cross border data flows.

⁵ The STRI suite contains a qualitative regulatory database with information on trade restrictiveness for 22 services sectors in five policy areas: Restrictions on 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.

regressions in order to identify their impact, implicitly assuming that $t_{ii} = 1$ (Heid et al., 2021; Anderson et al., 2018a). However, particularly for services trade there is a problem with this identification strategy, stemming from the fact that foreign affiliate sales are included in gross domestic product and hence domestic trade. Affiliate sales, or mode 3 in services trade agreements, are routinely covered by the services chapters in the FTA. Furthermore, the FTA provisions often applies to all modes of supply. As explained in the sector notes to the STRI, e.g., Kyvik Nordås et al. (2014), classifying trade policy measures by mode of supply proved difficult and a large portion of the list of measures are classified as applying to all modes. My paper takes a step in the direction of addressing this problem by explicitly capturing variation in internal trade costs across countries. The STRI policy area that most distinctly captures variation in policy-induced domestic trade is barriers to competition which in my study is a proxy for $t_{ii} \geq 1$. Since domestic regulation is such an important part of services trade costs, and domestic regulation varies across countries, even within the EU, this is an important services trade policy dimension hitherto largely overlooked and submerged in exporter-time and importer-time fixed effects.

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 Perdakis, 2010). None of these papers quantified the impact on trade flows. Moreover, the current proposal differs sufficiently from the previous one to warrant a fresh analysis. The schedules of commitments to be negotiated in due course will surely moderate the draft text and the estimated trade gains. Nevertheless, the draft text is a starting point and a useful benchmark for further analysis.

I start the empirical analysis with structural gravity regressions in order to verify that the 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, although parameters cannot always be precisely estimated in a full set of three-way fixed effects.⁶ Open and well-regulated telecommunications services is the single most important driver of services trade, 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 and counterfactual STRIs based on the draft FTA text. 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 (Fig. 1), total exports from India will increase much more than EU's, i.e. by about 20% 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 envisaged in the FTA text, 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 5 while Section 6 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 chapters 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

⁶ The panel is relatively short, 7 years, and the variables of interest do not vary a lot over time in the sample.

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 policies 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" 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, recognizing 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.

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.

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

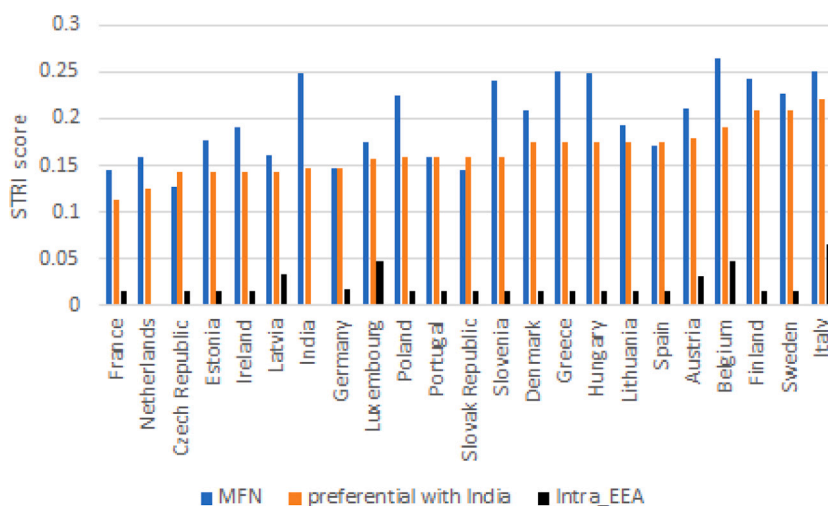


Fig. 2. STRI actual MFN, intra-EEA and counterfactual, computer services, 2021.

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.

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 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 Fig. 2. 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

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.

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

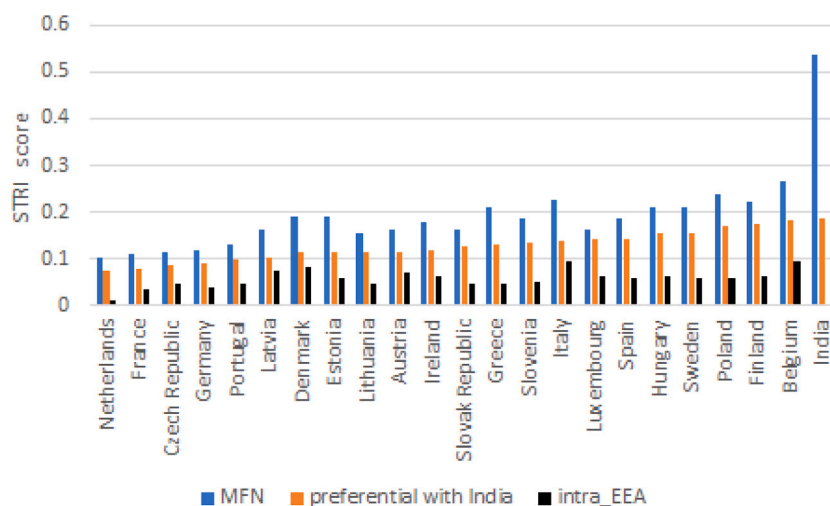


Fig. 3. STRI actual MFN, intra-EEA and counterfactual, delivery services, 2021.

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.

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

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 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 Fig. 4.

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

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

¹³ See [The Geography of Transport Systems](#).

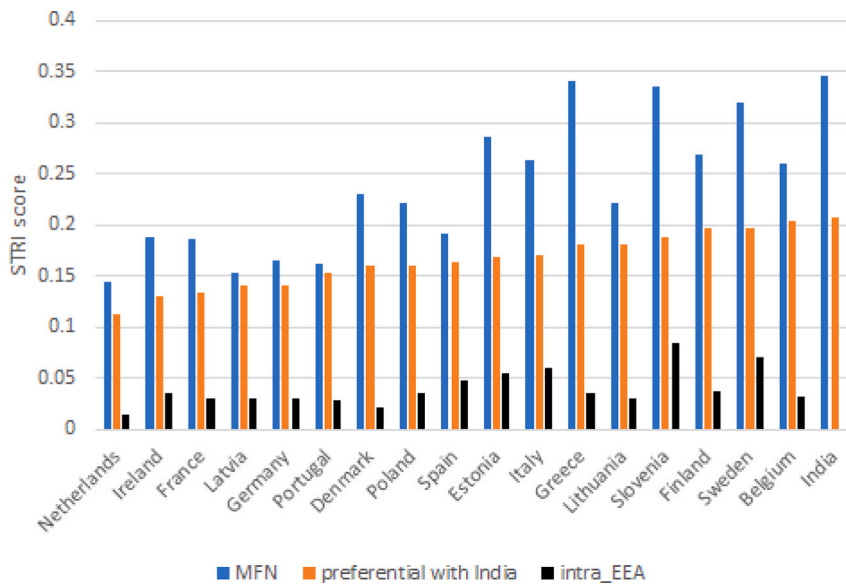


Fig. 4. STRI actual MFN, intra-EEA and counterfactual, Maritime transport, 2021.

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.

services. 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 ecommerce. 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.

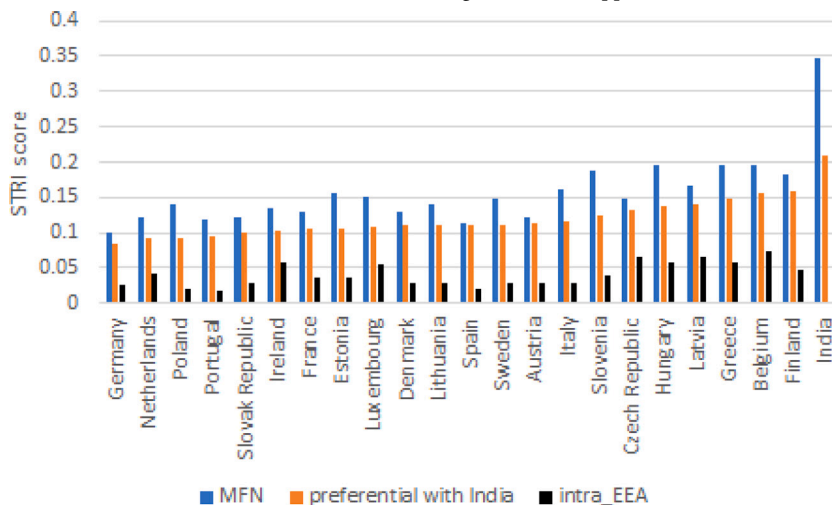


Fig. 5. STRI actual MFN, intra-EEA and counterfactual, Telecommunications, 2021.

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.

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

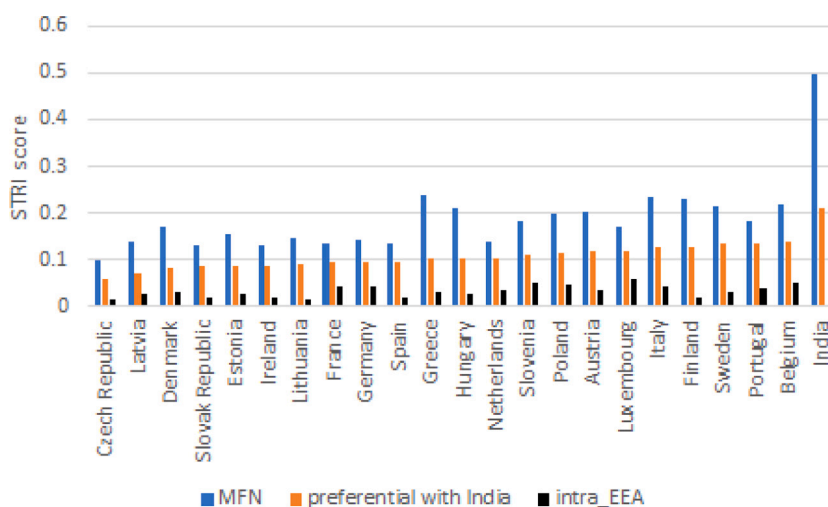


Fig. 6. STRI actual MFN, intra-EEA and counterfactual, Financial services 2021.

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.

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.

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, and intellectual property right protection. Performance requirements and commercial or local presence requirements in digital services markets are also covered.¹⁴

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

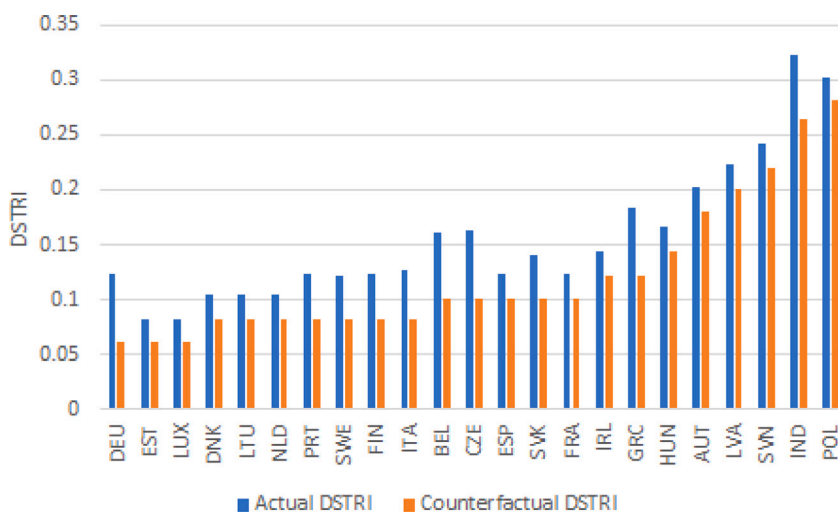


Fig. 7. Digital STRI actual MFN, and counterfactual, 2021.

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.

The counterfactual DSTRI are displayed together with the actuals for 2021 in Fig. 7. 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 OECD/WTO Balanced International Trade in Services (BaTIS), covering bilateral trade in 12 sectors for 202 countries during the period 2005–2021. It is a balanced and complete set, putting together information from numerous sources and estimating the missing cells in the bilateral trade matrix, including using gravity-based estimation techniques where data were missing (Liberatore and Wettstein, 2021). Obviously, this creates identification and endogeneity problems when using the data set for structural gravity.¹⁵

These concerns are valid, but there are still good reasons to use the OECD/WTO data. First, for every observation in the database, the source is provided. Furthermore, whenever an observation is estimated, the methodology applied is reported. This allows me to minimize the use of gravity-estimated observations and to run robustness checks dropping them altogether.¹⁶ Second, raw data at detailed sector level by destination country do not exist for most countries.¹⁷ Thus, bilateral services trade data are constructed by reconciling aggregate balance of payments data with sample surveys of trading firms and hence involve estimation at some stage in the data collection and cleaning process. Therefore, data for total services trade are much more frequently and reliably reported than bilateral services trade by sector.¹⁸ In short, raw data on bilateral services trade by sector is very limited, and the aggregate data from the OECD/WTO are the most consistent and best documented source of data available.

Information on internal trade, not covered by BaTIS, has been obtained from the OECD/WTO trade in value added (TiVA) database. It contains information on gross output and exports by country, sector and year during the period 1995–2020 for 76 countries and 45 industries. From this database I compute internal trade for the years 2005 to 2020 by subtracting exports from gross output for each sector, country and year. Note that gross output includes output produced by foreign affiliates located in the country in question, and hence services trade through mode 3.

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

¹⁵ An alternative database, the International Trade and Production Database for Estimation, has been constructed to avoid gravity estimated observations (ITPD_E) (Borchert et al., 2021).

¹⁶ Since a full square trade matrix is needed for the GEPPLM simulations, it was not possible to completely leave out gravity estimated observations.

¹⁷ The UN statistics office explains that: "The UNCTAD - WTO Services trade data set covers 201 economies, of which 156 are developing. Within the group of developing economies, fourteen economies have no data under the EBOPS 2010 classification. Another 43 had very limited reported items at the third and fourth levels. Only eight economies were found to have at least one record of level 5 items, and only four had trading partner data publicly available". Even in developed countries of which the UK may be a typical example, the UK Office for National Statistics explains that services trade data are entirely based on monthly surveys of 2 200 businesses and annual surveys of 27 200 businesses, and that several sectors and partner countries are missing.

¹⁸ As the metadata for the BaTIS describes it, the data are "broken down" by the 12 main EBOPS2010 (BPM6) categories.

Table 1
 Concordance EBOPS and ISIC rev 4.
 Sources: WTO-OECD Balanced Trade in Services Dataset (BaTiS) — BPM6 and Trade in Value Added (TiVA) 2022 edition.

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

bilateral trade – including internal trade – for the period 2005–2020 for four services sectors: construction, communications services, financial services, and other business services. See the concordance in [Table 1](#).

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 2014–2022. 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 bilateral STRIs.

Combining these four data sets yields a panel of 76 countries over 16 years for the analysis using the FTA dummy as the explanatory variable of interest and a panel of 50 countries over seven 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 et al. \(2018b\)](#). The model consists of the following four equations:

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

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

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

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

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.¹⁹

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

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

where $v_{i,t}$ and $\lambda_{j,t}$ represent country-year fixed effects for exporters and importers respectively, δ_{ij} depicts country pair fixed effects and $\epsilon_{i,j,t}$ is an error term. Time varying bilateral trade costs in the regressions are free-trade agreements, a dummy for EU membership 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 Teneyro, 2016](#)). As we will see, the pair fixed effects in some cases absorb all the variation in the data, including bilateral STRIs and EU membership, which do in fact not vary a lot over the time period considered. In such cases, I omit country pair fixed effects and add time invariant bilateral trade costs (distance, contiguity, common language and a dummy, denoted border, that takes the value 1 if $i \neq j$ and zero otherwise). The regression equation 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 using the counterfactual STRI scores presented in [Section 2 \(Table 2\)](#).

¹⁹ It is possible to introduce trade deficits and surpluses into the model by adding a wedge between supply and demand.

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 et al. (2018b) closely. First, I estimate the fixed effects gravity equation on a cross-section of data for the latest year available, which is 2020. The explanatory variables are 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, Eqs. (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 Eqs. (2) and (3). The second step is to estimate conditional gravity:

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

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 expenditure and output levels. The MRs are computed as follows:

$$\hat{P}_j = \frac{E_j}{E_0} \exp(-\hat{\lambda}_j) \tag{7}$$

$$\hat{\Pi}_i = E_0 Y_i \exp(-\hat{v}_i) \tag{8}$$

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:

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

5. Results

5.1. Structural gravity regressions

Structural gravity regressions for total services trade are presented in Table 3, which includes external trade only, and Table 4 which adds internal trade.²⁰ Starting with Table 3, the first column shows the result of regressions with the standard gravity variables with exporter-year and importer-year fixed effects. The parameters have the expected sign and the coefficients are within the range found in previous research.

When adding the STRI (column 2), the EU dummy turns negative. Recalling that the bilateral STRIs distinguish between trade policies affecting intra-EU and extra-EU trade, one would expect that its inclusion could render the EU dummy less statistically significant. A negative and significant coefficient is, however unexpected and counter-intuitive. A possible explanation could be that the policy mix defining the internal market favours foreign affiliate sales (mode 3) over cross-border trade. Unfortunately, data do not allow for further investigation of this possibility.

Telecommunications and financial services are essential infrastructure services for all services trade. I therefore explore the association between services trade restrictions in these two sectors and overall services trade. While open and well regulated telecommunications markets are strongly related to services trade flows (column 3), restrictions on commercial banking appear to be unrelated to total services trade (column 4). Adding pair fixed effects in columns (5) to (7) renders all other variables statistically insignificant. Thus, the three-way fixed effects pick up all the variation in the data set. The results are robust to excluding the gravity estimated observations in the OECD/WTO database (Table A.2)

²⁰ The impact of the STRIs can in principle be identified using external trade data only, since the indicators differ between intra-EEA trade and extra-EEA trade.

Table 3
Structural gravity, total services, external trade only.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------------------|------------------|--------------------|
| Ln distance | −0.514*** (−19.29) | −0.515*** (−19.49) | −0.514*** (−19.61) | −0.513*** (−19.22) | | | |
| Contiguous | 0.231* (2.44) | 0.257** (2.78) | 0.256** (2.88) | 0.239* (2.50) | | | |
| Common language | 0.357*** (4.09) | 0.336*** (3.93) | 0.336*** (4.13) | 0.353*** (4.01) | | | |
| FTA | 0.131* (2.07) | 0.127* (2.02) | 0.129* (2.08) | 0.133* (2.10) | 0.0442 (1.44) | 0.0432 (1.41) | 0.0454 (1.48) |
| Both EU | 0.289* (2.44) | −0.604** (−2.60) | −0.657* (−2.29) | 0.0235 (0.13) | 0.0744 (0.55) | 0.202 (1.48) | −0.0359 (−0.43) |
| STRI | | −7.301*** (−5.12) | | | −0.0922 (−0.10) | | |
| STRI TC | | | −11.04*** (−4.09) | | | 1.364 (1.07) | |
| STRI FSNK | | | | −2.344 (−1.91) | | | −1.052 (−1.77) |
| <i>N</i> | 25 338 | 25 338 | 25 338 | 25 338 | 25 135 | 25 135 | 25 135 |
| pseudo <i>R</i> ² | 0.930 | 0.931 | 0.931 | 0.930 | 0.994 | 0.994 | 0.994 |
| Pair fixed effects | No | No | No | No | Yes | Yes | 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 exporter-year and importer-year fixed effects. The data for the regressions include observations estimated using gravity. FSNK denotes commercial banking TC represents telecommunications.

When adding domestic trade (Table 4), 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, distinguishing between intra-EEA and extra-EEA trade policy.²¹

The most striking result in Table 4 is the huge border effect as captured by the dummy denoted Border. It takes the value 1 if $i \neq j$ and 0 if $i = j$. 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. A time varying border effect is introduced in columns (2) to (8). It turns out that the coefficient on the border dummy is fairly constant over time. For instance, in column (2) the border coefficient varies between −6.151 and −6.006.

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 in Table 3 would underestimate their impact on trade. Comparing columns (1) and (2) in Table 4 to column (1) in Table 3 suggests that this is indeed the case as far as the EU dummy is concerned. The both-EU dummy is highly significant and the coefficient implies that intra-EU services trade is about 1.5 times larger than extra-EU trade and trade between non-EU countries, all else equal (Table 4 columns (1) and (2)).²²

Adding the STRI renders the EU dummy insignificant also in the sample with internal trade. Note that the coefficient on the STRI is substantially smaller when adding internal trade, suggesting that its impact on trade is *overestimated* when excluding internal trade. Recalling that the STRI covers barriers to trade in all modes of supply and ($t_{ii} \geq 1$), this is consistent with the hypothesis that a higher STRI raise the cost of affiliate sales which are included in the domestic trade data. Pointing in the same direction is a robustness check running the regression in column (3) with a time invariant border dummy. The coefficient on the border dummy rises from −6.174 to −5.12 when adding the STRI.

The FTA dummy is statistically significant with the expected sign in columns (6) to (8) which posit three-way fixed effects. The coefficient implies that the average FTA boosts services trade by about 10%. We finally note that the STRI in telecommunications have the expected sign and is statistically significant in the three-way fixed effect regressions. The coefficient implies that a one standard deviation (15 basis points) lower STRI score on telecommunications raises total services trade by more than 40%. Robustness checks excluding gravity estimated observations (Table A.3), largely confirm the results reported in Table 4.

As noted in Table 1, internal and external trade could be matched for four services sectors. Of these, communications services and financial services are subject to specific sections in the proposed EU India FTA. Structural gravity regressions using sector-specific STRIs are reported in Tables 5 and 6. Financial services appear to be more sensitive to cultural than geographic distance. Sharing a common language is associated with 3.5 times more trade, while sharing a common border and geographical distance do not appear to be important. Trade within the European Union is also about 3.5 times higher than trade with or among third countries. As for total services, adding the bilateral STRIs renders the EU dummy insignificant. Restrictions on commercial banking are more

²¹ Administrative transparency contains measures related to procedures and cost of obtaining a visa and thus apply mostly to foreign services suppliers.

²² The trade effect of the EU dummy is the exponential of the coefficient less one.

Table 4
Structural gravity, total services, external and internal trade.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|-----------------------|-----------------------|----------------------|----------------------|----------------------|----------------------|--------------------|---------------------|--------------------|
| Ln distance | −0.221*** (−5.00) | −0.221*** (−5.00) | −0.251*** (−5.33) | −0.265*** (−5.88) | −0.233*** (−4.98) | | | |
| Contiguous | 0.340** (2.92) | 0.341** (2.93) | 0.354** (3.07) | 0.367*** (3.32) | 0.356** (3.03) | | | |
| Common language | 0.957*** (8.32) | 0.956*** (8.32) | 0.897*** (7.88) | 0.890*** (8.69) | 0.919*** (7.78) | | | |
| Border | −6.174*** (−43.67) | | | | | | | |
| FTA | −0.0533 (−0.65) | −0.0524 (−0.64) | −0.0436 (−0.52) | 0.0485 (0.60) | −0.0571 (−0.69) | 0.110** (3.20) | 0.115*** (3.34) | 0.110** (3.23) |
| Both EU | 0.921*** (11.55) | 0.919*** (11.48) | 0.000691 (0.00) | −0.445* (−2.28) | 0.376* (2.30) | −0.0908 (−0.99) | −0.207* (−2.53) | −0.0908 (−1.11) |
| STRI | | | −4.575*** (−5.05) | | | −0.733 (−1.16) | | |
| STRI TC | | | | −9.124*** (−7.33) | | | −2.413** (−3.28) | |
| STRI FSBNK | | | | | −2.854*** (−3.93) | | | −0.757 (−1.23) |
| N | 25 681 | 25 681 | 25 681 | 25 681 | 25 681 | 25 478 | 25 478 | 25 478 |
| pseudo R ² | 0.996 | 0.996 | 0.996 | 0.997 | 0.996 | 1.000 | 1.000 | 1.000 |
| Time-varying border | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Pair fixed effects | No | No | No | No | No | Yes | Yes | 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 exporter-year and importer-year fixed effects. The regressions include observations estimated using gravity. STRI FSBNK denotes the STRI in commercial banking while STRI TC represents the STRI in telecommunications.

strongly associated with services trade flows than are restrictions on insurance services. Finally, also in this case three-way fixed effects capture all the variation in the data. The results are robust to excluding gravity estimated observations (Table A.4).

Trade in communications services are also strongly associated with sharing a common language, as one would expect. The EU effect is strong and remains statistically significant when adding the STRI in computer services. Telecommunications provide the network over which communications services are traded and restrictions in this sector appear to have the largest impact on trade. A one standard deviation lower STRI TC is associated with almost three times more trade. Three-way fixed effects in this case change the sign of the STRI, while the EU dummy becomes highly significant and relatively large. This result is hard to explain, but the EU's common regulatory framework for telecommunications is probably captured by the STRI, which makes it difficult to distinguish between the two variables.²³ A final set of regressions pool trade and STRI data for communications services, construction, financial services, other business services and transport in order to exploit sectoral variation to identify the impact of trade restrictions on services trade, controlling for the standard gravity variables. Three-way fixed effects capture all the variation in the data also in this case.²⁴

This section has demonstrated that services trade restrictions as captured by the STRIs are (i) strongly and negatively associated with services trade; (ii) that the indicators capture the essence of the policies that distinguish intra-EEA from extra-EEA services trade; and (iii) that restrictions in telecommunications have a particularly dampening effect on services trade. With the notable exception of telecommunications restrictions, these results are not robust to the inclusion of three-way fixed effects. However, as explained by Weidner and Zylkin (2021), estimation noise in fixed effects may contaminate the scores of the parameters of interest, particularly when using three-way fixed effects in panels with a short time dimension and a large number of country pairs. Against this backdrop, the results of the two-way fixed effect regression form the basis for counterfactual simulations using general equilibrium PPML in the next section, with the necessary caution in interpreting the results.

5.2. Counterfactual scenarios

The general equilibrium simulations of the impact of the EU-India FTA has been performed both at the aggregate services level and for financial services and communications services (see Table 1).²⁵ I constructed three scenarios for the outcome of the

²³ A robustness check excluding gravity estimated observations are presented in Table A.5.

²⁴ The STRIs for transport are the average of the STRI for air transport, maritime transport, road transport and rail transport. Trade data for EBOPS sector SC is matched to internal trade data for ISIC rev 4 sector H49-51. A robustness check excluding gravity estimated observations are presented in Table A.6.

²⁵ 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 the agreement text does not contain any specific provisions for construction.

Table 5
Structural gravity, financial services, external and internal trade.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|------------------------------|-----------------------|---------------------|-----------------------|----------------------|-----------------------|--------------------|
| Ln distance | -0.123 (-1.64) | -0.124 (-1.64) | -0.139 (-1.94) | -0.188** (-2.59) | -0.167* (-2.34) | |
| Contiguous | 0.270 (1.14) | 0.270 (1.14) | 0.124 (0.55) | 0.0508 (0.22) | 0.0831 (0.36) | |
| Common language | 1.476*** (7.24) | 1.476*** (7.24) | 1.500*** (7.43) | 1.529*** (7.22) | 1.517*** (7.33) | |
| Border | -6.613*** (-25.59) | | | | | |
| FTA | -0.357** (-2.68) | -0.375** (-2.75) | -0.510*** (-4.30) | -0.526*** (-4.44) | -0.519*** (-4.41) | 0.0654 (1.89) |
| Both EU | 1.641*** (10.36) | 1.660*** (10.19) | 0.209 (1.07) | 0.390* (2.23) | 0.214 (1.18) | -0.0764 (-0.83) |
| STRI FSBNK | | | -8.152*** (-10.15) | | | |
| STRI FSINS | | | | -6.341*** (-9.99) | | |
| STRI FIN | | | | | -7.682*** (-10.95) | -0.926 (-1.73) |
| <i>N</i> | 38 219 | 38 219 | 25 027 | 25 027 | 25 027 | 24 331 |
| pseudo <i>R</i> ² | 0.992 | 0.992 | 0.994 | 0.994 | 0.994 | 1.000 |
| Time-varying border | No | Yes | Yes | Yes | Yes | Yes |
| Pair fixed effects | No | No | No | 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 exporter-year and importer-year fixed effects. The regressions include external and internal trade as well as observations estimated using gravity. FSBNK and FSINS denote commercial banking and insurance respectively, while FIN represents the simple average of the STRIs in commercial banking and insurance.

Table 6
Structural gravity, communications services, internal and external trade.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|------------------------------|-----------------------|----------------------|----------------------|----------------------|----------------------|--------------------|
| Ln distance | -0.342*** (-7.99) | -0.342*** (-7.98) | -0.321*** (-6.77) | -0.337*** (-7.22) | -0.326*** (-6.97) | |
| Contiguous | 0.0911 (0.64) | 0.0901 (0.63) | 0.0228 (0.17) | 0.00655 (0.05) | 0.0196 (0.14) | |
| Common language | 1.054*** (9.16) | 1.054*** (9.18) | 1.065*** (9.45) | 1.087*** (9.81) | 1.073*** (9.64) | |
| Border | -5.528*** (-39.25) | | | | | |
| FTA | -0.0945 (-1.00) | -0.110 (-1.15) | -0.258** (-2.81) | -0.175 (-1.90) | -0.220* (-2.40) | 0.117 (1.89) |
| Both EU | 1.238*** (13.64) | 1.253*** (13.55) | 0.456*** (3.76) | 0.217 (1.43) | 0.258 (1.92) | 0.603*** (4.32) |
| STRI CS | | | -4.540*** (-7.93) | | | |
| STRI TC | | | | -7.258*** (-7.87) | | |
| STRI ICT | | | | | -6.263*** (-8.70) | 4.690*** (4.59) |
| <i>N</i> | 37 864 | 37 864 | 25 609 | 25 609 | 25 609 | 24 860 |
| pseudo <i>R</i> ² | 0.991 | 0.991 | 0.992 | 0.993 | 0.993 | 0.999 |
| Time-varying border | No | Yes | Yes | Yes | Yes | Yes |
| Pair fixed effects | No | No | No | 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 exporter-year and importer-year fixed effects. The regressions include external and internal trade as well as gravity estimated observations. CS and TC denote computer services and telecommunications respectively, while ICT represents the average STRI score of the two sectors.

Table 7
Full general equilibrium simulation of the EU India FTA.

| | All services | | | Financial services | | | Communications services | | |
|--------------------------------------|--------------|------------|------------|--------------------|------------|------------|-------------------------|------------|------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 1 | Scenario 2 | Scenario 3 |
| Total exports EU | 1.22 | 2.71 | 0.63 | 2.08 | 2.04 | 1.53 | -0.09 | -0.05 | -0.13 |
| Total exports India | 22.31 | 29.60 | 11.28 | 53.75 | 62.26 | 40.24 | 1.67 | 2.30 | 0.95 |
| Exports from EU to India | 128.88 | 118.81 | 68.54 | 274.61 | 251.85 | 201.98 | 78.26 | 76.76 | 56.91 |
| Exports from India to EU | 54.25 | 55.24 | 25.27 | 98.21 | 107.77 | 78.58 | 10.65 | 11.24 | 9.49 |
| Intra-EU trade | -0.02 | -1.68 | 0.00 | -0.04 | -0.24 | -0.05 | -0.51 | -0.52 | -0.50 |
| India's exports to third countries | -2.15 | -3.86 | -1.24 | -6.03 | -7.13 | -4.38 | -1.98 | -1.98 | -1.98 |
| India's imports from third countries | -2.55 | -4.08 | -1.49 | -7.31 | -8.03 | -5.30 | -1.78 | -1.87 | -1.87 |
| Real output, EU | 0.02 | 0.08 | 0.01 | 0.03 | 0.04 | 0.03 | 0.05 | 0.05 | 0.05 |
| Real output, India | 0.18 | 0.26 | 0.09 | 0.34 | 0.41 | 0.24 | 0.36 | 0.40 | 0.32 |

Notes: The table reports % changes compared to the baseline for total services (columns 1–3), financial services (columns 3–5), and communications (ICT) services (columns 6–9) for the three scenarios. Explanatory variables are bilateral, directional STRIs for the services sector indicated by the column heads.

agreement, all based on the text discussed in section two, but making different assumptions on how the non-discriminatory domestic regulation measures are implemented and how they affect third countries:

- Scenario 1: All provisions in the draft text are implemented by all EU countries as well as India. No changes are made to the restrictiveness towards third countries.
- Scenario 2: All provisions in the draft text are implemented by all EU countries as well as India. The non-discriminatory domestic regulation provisions apply to third countries as well; i.e., MFN scores are changed to reflect provisions in the draft text.
- Scenario 3: All EU countries and India lift the discriminatory trade restrictions as described in the draft text, while non-discriminatory domestic regulation measures are not implemented by any of the parties.

We can think of the first scenario as relevant if trade expansion mostly takes place at the extensive margin. If discriminatory barriers to entry remain high for third countries, easing of behind the border domestic regulation is unlikely to attract new traders from third countries. The second scenario is the straight forward application of all the measures in the text. The third scenario assumes that the proposed changes to domestic regulation are included as best endeavor clauses without immediate practical consequences. The results of the full general equilibrium simulations are reported in Table 7.

Compared to studies analysing the average FTAs, e.g., Borchert and Di Ubaldo (2021) and Ebell (2016), the impact of the proposed EU-India FTA is large. Thus, while the average FTA is typically found to have no significant impact on services trade, deep agreements offering market access, dispute settlements and ratchet clauses among other provisions, increase trade by up to 65% (Borchert et al., 2021). The services trade impact of the EU-India agreement is in the ballpark of the latter estimates.²⁶

The results 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 (Fig. 1). Therefore, more than 50% export growth affecting a third of Indian services exports accounts for more in total exports growth than a doubling of exports that accounted for only about 2% of EU's total exports before the FTA.

Scenario 1 comprises the highest preference margins while scenario 2 yields the most wide-ranging trade liberalization. Scenario 3 is the least ambitious, but still deeper than the average trade agreement. As one would expect, the largest overall export expansion occurs under scenario 2, for all sectors for India while total export expansion in financial services is about the same for scenarios 1 and 2 in the EU. It is also clear that the reforms to domestic regulation account for a very large share of total export expansion. In fact both India's and the EU's overall export expansion is twice as high with the reforms to domestic regulation than without them (scenario 3).

Interestingly, a high preference margin (scenario 1) is more important for EU's export to India, while more liberal domestic regulation (scenario 2) is more important for India's exports to the EU. This of course has to do with a much higher preference margin for EU exporters to India as indicated in Figs. 2 to 6. India would actually benefit more from regulatory reforms in the EU that would effectively apply on an MFN basis than if such reforms could somehow give India preferences, suggesting that India would benefit both from a larger export market and take a bigger share of it.

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 (Fig. 6). 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 India's exports to the EU of 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.

²⁶ Note, however, that Borchert and Di Ubaldo (2021) only reports the direct effects of the FTAs of various depth, not the general equilibrium effects.

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, particularly in financial services. Details for all 50 countries included in the simulations are reported in tables in [Tables A.7 to A.9](#).

6. Concluding remarks

This paper provides a methodology for ex ante empirical assessments of the services chapters in FTAs, applied to the proposed EU India FTA. 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 ([Nath and Liu, 2017](#); [Kyvik Nordås and Rouzet, 2017](#); [Kyvik Nordås, 2020](#)). This raises two points for further analysis and policy implementation. First, trade governance in the digital economy still needs to focus on the basics of connectivity and market access in telecommunications. Second, what constitutes a best-practice pro-competitive telecommunications regulation is conditional on market structure as well as technology, and changes over time. FTAs, particularly between countries at different levels of development, therefore need to be flexible and focus on interoperable regulatory principles 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, official services 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, order of magnitude and, importantly, the asymmetry of changes. And hopefully more empirical research raise demand for better data.

Another limitation is that the data do not cover affiliate sales, or mode 3 if you will. The FTA chapter on services in the EU India agreement 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. Trade and affiliate sales may in some cases be substitutes and in other complements ([Sleuwaegen and Smith, 2021](#); [Kyvik Nordås et al., 2022](#)), so it is clearly desirable to run simultaneous regressions for trade and affiliate sales where possible. Another complication is that, statistically speaking, affiliate sales are part of internal trade. This seems to be overlooked in recent work that add internal trade and a border dummy in order to identify the impact of country-specific trade policy variables in gravity regressions. Findings in this paper suggest that this may matter, and is worth looking into in future research such as making a distinction between demand driven home bias and a cost advantage of domestic production.

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 solutions that are suitable for each party and which may evolve over time with changing technology and market conditions. Going forward, more work is needed to study the relationship between trade policy and the digital transition in detail. Of particular importance is to pin down what the objective of interoperable regulatory frameworks mean in practice. Such analysis will also inform the work in the EU-India Trade and Technology Council.

To conclude, as the appetite for deep agreements that limit the policy space in key areas of domestic regulation seems to be meagre, the architecture of the EU India FTA will provide insights and experience for other agreements, not least between developing and developed countries. The measures affecting domestic regulation in the draft agreement account for as much as half of the predicted export expansion between the parties. A major challenge to address in future research is therefore to find ways to reconcile politically feasible agreements with ambitious interoperable regulatory frameworks, particularly in the digital area.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix

See [Tables A.1–A.9](#).

Table A.1
Descriptive statistics.

| Bilateral trade (USD millions) | Observations | Mean | Std. Dev | Min | Max |
|--------------------------------|--------------|-----------|-----------|-----------|-----------|
| Total services | 91,200 | 667.0993 | 2948.104 | 0 | 108 516 |
| Construction | 91,200 | 11.40336 | 60.4911 | 0 | 3371.792 |
| Communications services | 91,200 | 53.36167 | 290.4229 | 0 | 13 819 |
| Financial services | 91,200 | 62.57221 | 467.3346 | 0 | 28 190 |
| Other business services | 91,200 | 158.8227 | 841.5138 | 0 | 56 534 |
| Internal trade | | | | | |
| Total services | 1200 | 714 368.3 | 1 425 220 | 1908.996 | 1.50E+07 |
| Construction | 1200 | 105 742.5 | 293 277.9 | 390.931 | 3 714 021 |
| Communications services | 1200 | 35 274.95 | 71 225.29 | 73.2659 | 638 683 |
| Financial services | 1200 | 56 217.35 | 116 931.7 | 82.8587 | 1 266 445 |
| Other business services | 1200 | 76 008.03 | 154 626.6 | 76.7349 | 1 439 360 |
| Gravity variables | | | | | |
| Distance (km) | 5776 | 6942.801 | 4676.395 | 55 | 19 815 |
| Contiguity | 5776 | 0.0336842 | 0.1804177 | 0 | 1 |
| Common border | 5776 | 0.0764912 | 0.2657864 | 0 | 1 |
| Border | 5776 | 0.9868421 | 0.1139606 | 0 | 1 |
| Both EU | 91,200 | 0.1250658 | 0.3307953 | 0 | 1 |
| FTA | 91,200 | 0.2319079 | 0.4220528 | 0 | 1 |
| MFN STRI | | | | | |
| Computer services | 350 | 0.204408 | 0.0631815 | 0.0979959 | 0.4106596 |
| Courier services | 350 | 0.2790044 | 0.1593433 | 0.0787639 | 1 |
| Commercial banking | 350 | 0.2331311 | 0.0958022 | 0.0584192 | 0.4962199 |
| Insurance | 350 | 0.220455 | 0.1180965 | 0.0650738 | 0.5886385 |
| Maritime transport | 308 | 0.2708089 | 0.084598 | 0.1500816 | 0.5236542 |
| Telecommunications | 350 | 0.2334184 | 0.1442513 | 0.0866511 | 0.7293109 |
| Bilateral STRI | | | | | |
| Computer services | 26,250 | 0.1789091 | 0.0917023 | 0 | 0.4106596 |
| Courier services | 26,250 | 0.2607239 | 0.1766956 | 0.009 | 1 |
| Commercial banking | 26,250 | 0.2126764 | 0.1168962 | 0.0096 | 0.4962199 |
| Insurance | 26,250 | 0.1979714 | 0.1375127 | 0.0091 | 0.5886385 |
| Maritime transport | 23,100 | 0.2434901 | 0.114989 | 0.0075 | 5.24E-01 |
| Telecommunications | 26,250 | 0.2180112 | 0.1571428 | 0.017 | 0.7293109 |

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

Table A.2
Structural gravity, external trade only, excluding gravity estimated observations.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------|--------------------|--------------------|
| Ln distance | -0.498*** (-15.40) | -0.498*** (-15.56) | -0.498*** (-15.67) | -0.496*** (-15.35) | | | |
| Contiguous | 0.215* (2.00) | 0.247* (2.34) | 0.246* (2.43) | 0.224* (2.06) | | | |
| Common language | 0.406*** (3.74) | 0.379*** (3.56) | 0.379*** (3.76) | 0.401*** (3.65) | | | |
| FTA | 0.143 (1.68) | 0.139 (1.63) | 0.143 (1.70) | 0.146 (1.70) | 0.00179 (0.05) | 0.000635 (0.02) | 0.00305 (0.08) |
| Both EU | 0.344* (2.32) | -0.539* (-2.17) | -0.593* (-2.01) | 0.0879 (0.42) | 0.0670 (0.55) | 0.195 (1.52) | -0.0120 (-0.15) |
| STRI | | -7.195*** (-5.07) | | | -0.339 (-0.41) | | |
| STRI TC | | | -10.89*** (-4.09) | | | 1.010 (0.81) | |
| STRI FSNK | | | | -2.247 (-1.80) | | | -1.038 (-1.68) |
| N | 16 042 | 16 042 | 16 042 | 16 042 | 15 839 | 15 839 | 15 839 |
| pseudo R ² | 0.922 | 0.924 | 0.924 | 0.922 | 0.995 | 0.995 | 0.995 |
| Pair fixed effects | No | No | No | No | Yes | Yes | 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 exporter-year and importer-year fixed effects. The data for the regressions exclude observations estimated using gravity.

Table A.3
Structural gravity, internal and external trade, excluding gravity estimated observations.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|-----------------------|-----------------------|----------------------|----------------------|----------------------|----------------------|-------------------|-------------------|--------------------|
| Ln distance | -0.168*** (-3.41) | -0.168*** (-3.41) | -0.211*** (-3.88) | -0.245*** (-4.53) | -0.178*** (-3.39) | | | |
| Contiguous | 0.382** (2.98) | 0.383** (2.99) | 0.403** (3.26) | 0.398** (3.36) | 0.403** (3.17) | | | |
| Common language | 0.955*** (7.35) | 0.954*** (7.35) | 0.867*** (7.08) | 0.844*** (7.87) | 0.914*** (6.96) | | | |
| Border | -6.074*** (-42.87) | | | | | | | |
| FTA | -0.118 (-1.21) | -0.117 (-1.19) | -0.0904 (-0.90) | 0.0403 (0.39) | -0.114 (-1.15) | 0.0818* (1.97) | 0.0836* (2.01) | 0.0809* (1.96) |
| Both EU | 0.763*** (8.38) | 0.760*** (8.30) | -0.196 (-0.83) | -0.718** (-3.02) | 0.386* (2.10) | -0.116 (-1.08) | -0.129 (-1.29) | -0.0638 (-0.71) |
| STRI | | | -5.079*** (-4.16) | | | -0.881 (-1.11) | | |
| STRI TC | | | | -10.34*** (-6.30) | | | -1.414 (-1.44) | |
| STRI FSBNK | | | | | -2.118* (-2.22) | | | -0.467 (-0.68) |
| N | 16 308 | 16 308 | 16 308 | 16 308 | 16 308 | 16 105 | 16 105 | 16 105 |
| pseudo R ² | 0.997 | 0.997 | 0.997 | 0.997 | 0.997 | 1.000 | 1.000 | 1.000 |
| Time-varying border | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Pair fixed effects | No | No | No | No | No | Yes | Yes | 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 exporter-year and importer-year fixed effects. The data for the regressions exclude observations estimated using gravity.

Table A.4
Structural gravity financial services, excluding gravity estimated observations.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|----------------------------|-----------------------|----------------------|----------------------|----------------------|----------------------|-------------------|
| Ln distance | -0.122 (-1.70) | -0.122 (-1.69) | -0.116 (-1.42) | -0.134 (-1.63) | -0.134 (-1.65) | |
| Contiguous | 0.145 (0.60) | 0.144 (0.60) | 0.163 (0.72) | 0.0868 (0.37) | 0.116 (0.51) | |
| Common language | 1.438*** (6.74) | 1.442*** (6.78) | 1.359*** (6.44) | 1.419*** (6.49) | 1.389*** (6.43) | |
| Border | -6.023*** (-26.29) | | | | | |
| FTA | -0.563*** (-4.24) | -0.592*** (-4.39) | -0.618*** (-4.70) | -0.634*** (-4.78) | -0.625*** (-4.75) | 0.0627 (1.77) |
| Both EU | 1.319*** (9.63) | 1.348*** (9.54) | -0.0289 (-0.08) | 0.449 (1.81) | 0.0902 (0.31) | -0.154 (-1.21) |
| STRI FSBNK | | | -8.736*** (-4.59) | | | |
| STRI FSINS | | | | -5.196*** (-4.30) | | |
| STRI FIN | | | | | -7.560*** (-4.98) | -1.635 (-1.92) |
| N | 17 963 | 17 963 | 12 701 | 12 701 | 12 701 | 11 954 |
| pseudo R ² | 0.994 | 0.994 | 0.994 | 0.994 | 0.994 | 1.000 |
| Time-varying fixed effects | No | Yes | Yes | Yes | Yes | Yes |
| Pair fixed effects | No | No | No | 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 exporter-year and importer-year fixed effects. The data for the regressions exclude observations estimated using gravity.

Table A.5
Structural gravity, communications services, excluding gravity estimated observations.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|------------------------------|-----------------------|----------------------|----------------------|----------------------|----------------------|--------------------|
| Ln distance | -0.312*** (-7.21) | -0.312*** (-7.20) | -0.302*** (-6.07) | -0.367*** (-6.99) | -0.331*** (-6.58) | |
| Contiguous | 0.0634 (0.43) | 0.0627 (0.43) | 0.0511 (0.37) | 0.0374 (0.28) | 0.0534 (0.39) | |
| Common language | 0.995*** (8.29) | 0.996*** (8.35) | 0.943*** (8.01) | 0.920*** (8.44) | 0.922*** (8.19) | |
| Border | -5.243*** (-38.18) | | | | | |
| FTA | -0.270** (-2.63) | -0.291** (-2.79) | -0.343*** (-3.34) | -0.193 (-1.91) | -0.286** (-2.83) | 0.150** (2.72) |
| Both EU | 1.120*** (12.01) | 1.141*** (11.94) | 0.348* (2.16) | -0.394* (-1.99) | -0.172 (-0.90) | 0.771*** (4.03) |
| STRI CS | | | -4.892*** (-5.28) | | | |
| STRI TC | | | | -11.42*** (-8.55) | | |
| STRI ICT | | | | | -8.762*** (-7.20) | 6.115*** (4.32) |
| <i>N</i> | 17 643 | 17 643 | 13 318 | 13 318 | 13 318 | 12 502 |
| pseudo <i>R</i> ² | 0.993 | 0.993 | 0.994 | 0.994 | 0.994 | 0.999 |

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 exporter-year and importer-year fixed effects. The data for the regressions exclude observations estimated using gravity.

Table A.6
Pooled regressions.

| | (1) | (2) | (3) | (4) | (5) |
|------------------------------|-----------------------|----------------------|----------------------|----------------------|--------------------|
| Ln distance | -0.197*** (-4.67) | -0.197*** (-4.72) | | -0.188*** (-3.69) | |
| Contiguous | 0.381** (3.19) | 0.384** (3.23) | | 0.284* (2.56) | |
| Common language | 1.031*** (8.97) | 1.030*** (8.97) | | 0.990*** (7.94) | |
| Border | -5.760*** (-42.84) | | | | |
| FTA | -0.202* (-2.20) | -0.227* (-2.49) | -0.078* (-2.46) | -0.280** (-3.26) | -0.0242 (-0.87) |
| Both EU | 0.877*** (10.64) | 0.901*** (10.88) | -0.000402 (-0.01) | 0.491** (3.01) | -0.343* (-2.34) |
| STRI | | | | -2.683** (-3.28) | -2.323* (-2.34) |
| <i>N</i> | 843 773 | 843 773 | 762 674 | 142 278 | 134 827 |
| pseudo <i>R</i> ² | 0.983 | 0.983 | 0.986 | 0.980 | 0.984 |
| Time-varying border | No | Yes | Yes | Yes | Yes |
| Pair fixed effects | No | No | Yes | 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 exporter-year, importer-year and sector fixed effects. The sectors included are communications services, construction, finance, other business services and transport. The data for the regressions exclude observations estimated using gravity.

Table A.7
Simulation results using bilateral counterfactual STRIs, total services, % change from baseline.

| Country | Scenario 1 | | Scenario 2 | | Scenario 3 | |
|---------|------------|-------------|------------|-------------|------------|-------------|
| | Exports | Real output | Exports | Real output | Exports | Real output |
| AUS | -0.001 | 0.000 | 3.380 | 0.020 | -0.001 | 0.000 |
| AUT | 1.061 | 0.025 | 2.730 | 0.144 | 0.529 | 0.012 |
| BEL | 1.119 | 0.020 | 2.422 | 0.093 | 0.587 | 0.010 |
| BRA | 0.003 | 0.000 | 3.648 | 0.019 | 0.002 | 0.000 |
| CAN | 0.003 | 0.000 | 2.627 | 0.021 | 0.002 | 0.000 |
| CHE | 0.020 | 0.000 | 7.012 | 0.048 | 0.015 | 0.000 |
| CHL | 0.003 | 0.000 | 3.185 | 0.051 | 0.002 | 0.000 |
| CHN | 0.001 | 0.000 | 4.228 | 0.007 | -0.002 | 0.000 |
| COL | 0.003 | 0.000 | 3.033 | 0.049 | 0.002 | 0.000 |
| CRI | 0.004 | 0.000 | 2.277 | 0.079 | 0.002 | 0.000 |
| CZE | 0.952 | 0.028 | 1.034 | 0.093 | 0.488 | 0.014 |
| DEU | 1.112 | 0.009 | 1.985 | 0.038 | 0.574 | 0.004 |
| DNK | 1.174 | 0.025 | 0.821 | 0.050 | 0.687 | 0.016 |
| ESP | 1.218 | 0.014 | 2.416 | 0.063 | 0.626 | 0.007 |
| EST | 1.225 | 0.100 | 2.407 | 0.364 | 0.674 | 0.056 |
| FIN | 1.273 | 0.031 | 0.709 | 0.044 | 0.765 | 0.020 |
| FRA | 1.237 | 0.012 | 4.528 | 0.086 | 0.581 | 0.005 |
| GBR | 0.016 | 0.000 | 3.541 | 0.019 | 0.010 | 0.000 |
| GRC | 1.385 | 0.044 | 1.683 | 0.109 | 0.832 | 0.028 |
| HUN | 1.327 | 0.050 | 2.830 | 0.205 | 0.716 | 0.027 |
| IDN | -0.002 | 0.000 | 3.353 | 0.018 | -0.002 | 0.000 |
| IND | 22.311 | 0.181 | 29.602 | 0.265 | 11.284 | 0.093 |
| IRL | 1.442 | 0.026 | 3.357 | 0.113 | 0.763 | 0.014 |
| ISL | -0.036 | -0.008 | -0.256 | 0.048 | -0.021 | -0.005 |
| ISR | 0.004 | 0.000 | 3.235 | 0.033 | 0.002 | 0.000 |
| ITA | 1.489 | 0.014 | 4.210 | 0.074 | 0.763 | 0.007 |
| JPN | -0.003 | 0.000 | 3.493 | 0.012 | -0.002 | 0.000 |
| KAZ | -0.007 | 0.000 | 3.068 | 0.047 | -0.005 | 0.000 |
| KOR | -0.005 | 0.000 | 3.260 | 0.016 | -0.003 | 0.000 |
| LTU | 0.993 | 0.071 | 1.252 | 0.219 | 0.543 | 0.039 |
| LUX | 1.109 | 0.034 | 3.613 | 0.220 | 0.523 | 0.014 |
| LVA | 1.020 | 0.081 | 0.860 | 0.178 | 0.568 | 0.046 |
| MEX | 0.002 | 0.000 | 2.669 | 0.020 | 0.001 | 0.000 |
| MYS | -0.002 | 0.000 | 3.286 | 0.037 | -0.002 | 0.000 |
| NLD | 1.148 | 0.014 | 1.594 | 0.048 | 0.610 | 0.007 |
| NOR | -0.009 | -0.002 | -0.410 | 0.011 | -0.006 | -0.001 |
| NZL | -0.001 | 0.000 | 2.937 | 0.040 | -0.001 | 0.000 |
| PER | 0.003 | 0.000 | 2.913 | 0.054 | 0.002 | 0.000 |
| POL | 1.357 | 0.030 | 4.867 | 0.198 | 0.645 | 0.013 |
| PRT | 1.220 | 0.032 | 3.630 | 0.193 | 0.588 | 0.014 |
| RUS | -0.005 | 0.000 | 4.018 | 0.027 | -0.004 | 0.000 |
| SGP | -0.005 | 0.000 | 2.550 | 0.020 | -0.004 | 0.000 |
| SVK | 1.121 | 0.054 | 3.799 | 0.354 | 0.517 | 0.022 |
| SVN | 1.142 | 0.079 | 2.666 | 0.359 | 0.602 | 0.041 |
| SWE | 1.309 | 0.022 | 0.752 | 0.033 | 0.783 | 0.014 |
| THA | -0.003 | 0.000 | 3.429 | 0.027 | -0.002 | 0.000 |
| TUR | 0.004 | 0.000 | 3.594 | 0.033 | 0.003 | 0.000 |
| USA | 0.003 | 0.000 | 2.782 | 0.005 | 0.002 | 0.000 |
| VNM | -0.010 | 0.000 | 3.156 | 0.045 | -0.007 | 0.000 |
| ZAF | 0.002 | 0.000 | 3.518 | 0.039 | 0.001 | 0.000 |

Notes: The table present full general equilibrium effects relative to baseline and benchmark country which is the US. The simulations are on total services trade and the average actual and counterfactual STRI for all sectors.

Table A.8
Simulation results using bilateral counterfactual STRI, financial services, % change from baseline.

| Country | Scenario 1 | | Scenario 2 | | Scenario 3 | |
|---------|------------|-------------|------------|-------------|------------|-------------|
| | Exports | Real output | Exports | Real output | Exports | Real output |
| AUS | -0.046 | 0.000 | 0.497 | 0.003 | -0.065 | 0.000 |
| AUT | 1.965 | 0.057 | 2.174 | 0.080 | 1.444 | 0.044 |
| BEL | 1.719 | 0.037 | 2.213 | 0.071 | 1.249 | 0.028 |
| BRA | -0.022 | 0.000 | 0.483 | 0.002 | -0.044 | 0.000 |
| CAN | -0.013 | 0.000 | 0.374 | 0.003 | -0.031 | 0.000 |
| CHE | 0.110 | 0.000 | 0.393 | 0.002 | 0.064 | 0.000 |

(continued on next page)

Table A.8 (continued).

| Country | Scenario 1 | | Scenario 2 | | Scenario 3 | |
|---------|------------|-------------|------------|-------------|------------|-------------|
| | Exports | Real output | Exports | Real output | Exports | Real output |
| CHL | -0.019 | -0.001 | 0.440 | 0.008 | -0.041 | -0.001 |
| CHN | -0.162 | 0.000 | 0.801 | 0.002 | -0.178 | 0.000 |
| COL | -0.016 | -0.001 | 0.431 | 0.008 | -0.038 | -0.001 |
| CRI | -0.004 | -0.001 | 0.333 | 0.014 | -0.024 | -0.002 |
| CZE | 1.866 | 0.088 | 1.566 | 0.077 | 1.371 | 0.067 |
| DEU | 1.864 | 0.020 | 2.062 | 0.030 | 1.352 | 0.015 |
| DNK | 2.277 | 0.066 | 2.010 | 0.061 | 1.703 | 0.052 |
| ESP | 2.449 | 0.040 | 2.144 | 0.035 | 1.800 | 0.030 |
| EST | 1.758 | 0.248 | 1.932 | 0.336 | 1.299 | 0.187 |
| FIN | 2.413 | 0.084 | 2.619 | 0.109 | 1.796 | 0.065 |
| FRA | 2.090 | 0.024 | 1.745 | 0.021 | 1.531 | 0.019 |
| GBR | 0.065 | 0.000 | 0.259 | -0.001 | 0.035 | 0.000 |
| GRC | 2.856 | 0.105 | 2.633 | 0.102 | 2.178 | 0.085 |
| HUN | 2.137 | 0.115 | 1.901 | 0.109 | 1.610 | 0.091 |
| IDN | -0.055 | 0.000 | 0.491 | 0.003 | -0.072 | 0.000 |
| IND | 53.751 | 0.342 | 62.264 | 0.407 | 40.236 | 0.244 |
| IRL | 1.354 | 0.044 | 1.122 | 0.035 | 0.995 | 0.035 |
| ISL | -0.110 | -0.042 | -0.044 | -0.023 | -0.099 | -0.032 |
| ISR | -0.016 | 0.000 | 0.516 | 0.006 | -0.043 | -0.001 |
| ITA | 2.851 | 0.028 | 2.583 | 0.026 | 2.142 | 0.022 |
| JPN | -0.056 | 0.000 | 0.533 | 0.003 | -0.074 | 0.000 |
| KAZ | -0.065 | -0.001 | 0.427 | 0.010 | -0.078 | -0.002 |
| KOR | -0.049 | 0.000 | 0.412 | 0.003 | -0.063 | -0.001 |
| LTU | 1.552 | 0.234 | 1.324 | 0.214 | 1.154 | 0.179 |
| LUX | 2.178 | 0.030 | 3.026 | 0.060 | 1.568 | 0.022 |
| LVA | 1.698 | 0.265 | 1.463 | 0.242 | 1.269 | 0.204 |
| MEX | -0.025 | 0.000 | 0.445 | 0.003 | -0.044 | 0.000 |
| MYS | -0.056 | 0.000 | 0.471 | 0.005 | -0.072 | -0.001 |
| NLD | 2.331 | 0.032 | 1.985 | 0.028 | 1.707 | 0.025 |
| NOR | -0.066 | -0.015 | -0.013 | -0.009 | -0.072 | -0.012 |
| NZL | -0.034 | 0.000 | 0.397 | 0.007 | -0.051 | -0.001 |
| PER | -0.014 | -0.001 | 0.395 | 0.009 | -0.035 | -0.001 |
| POL | 2.217 | 0.061 | 2.455 | 0.085 | 1.636 | 0.047 |
| PRT | 2.206 | 0.069 | 1.938 | 0.062 | 1.628 | 0.053 |
| RUS | -0.017 | -0.001 | 0.518 | 0.004 | -0.041 | -0.001 |
| SGP | -0.019 | 0.001 | 0.127 | -0.002 | -0.023 | 0.000 |
| SVK | 1.734 | 0.141 | 1.466 | 0.126 | 1.281 | 0.108 |
| SVN | 1.644 | 0.171 | 1.408 | 0.156 | 1.224 | 0.132 |
| SWE | 2.256 | 0.061 | 2.005 | 0.057 | 1.682 | 0.048 |
| THA | -0.071 | 0.000 | 0.575 | 0.003 | -0.090 | 0.000 |
| TUR | 0.002 | -0.001 | 0.521 | 0.008 | -0.030 | -0.001 |
| USA | -0.007 | 0.000 | 0.377 | 0.001 | -0.026 | 0.000 |
| VNM | -0.072 | -0.001 | 0.410 | 0.006 | -0.081 | -0.001 |
| ZAF | -0.028 | 0.000 | 0.473 | 0.005 | -0.050 | -0.001 |

Notes: The table present full general equilibrium effects for financial services relative to baseline and benchmark country which is the US. The STRIs are the actual and counterfactuals for financial services.

Table A.9

Simulation results using bilateral counterfactual STRI, communication services, % change from baseline.

| Country | Scenario 1 | | Scenario 2 | | Scenario 3 | |
|---------|------------|-------------|------------|-------------|------------|-------------|
| | Exports | Real output | Exports | Real output | Exports | Real output |
| AUS | -0.276 | 0.036 | -0.088 | 0.038 | -0.298 | 0.036 |
| AUT | 0.023 | 0.053 | 0.039 | 0.054 | -0.018 | 0.051 |
| BEL | 0.433 | 0.034 | 1.620 | 0.098 | 0.113 | 0.018 |
| BRA | -0.233 | 0.030 | -0.060 | 0.032 | -0.248 | 0.029 |
| CAN | -0.503 | 0.087 | -0.351 | 0.091 | -0.509 | 0.087 |
| CHE | -0.182 | 0.016 | 0.050 | 0.019 | -0.196 | 0.016 |
| CHL | -0.288 | 0.040 | -0.149 | 0.046 | -0.302 | 0.040 |
| CHN | -0.197 | 0.021 | 0.008 | 0.022 | -0.229 | 0.021 |
| COL | -0.556 | 0.104 | -0.444 | 0.108 | -0.546 | 0.104 |
| CRI | -0.059 | 0.009 | -0.055 | 0.009 | -0.061 | 0.009 |
| CZE | -0.201 | 0.005 | -1.125 | -0.088 | -0.099 | 0.016 |

(continued on next page)

Table A.9 (continued).

| Country | Scenario 1 | | Scenario 2 | | Scenario 3 | |
|---------|------------|-------------|------------|-------------|------------|-------------|
| | Exports | Real output | Exports | Real output | Exports | Real output |
| DEU | 0.121 | 0.011 | 0.147 | 0.011 | 0.065 | 0.010 |
| DNK | -0.371 | 0.112 | -1.518 | 0.046 | -0.222 | 0.121 |
| ESP | -0.126 | 0.035 | -0.116 | 0.035 | -0.175 | 0.033 |
| EST | 0.006 | 0.164 | 0.249 | 0.214 | -0.082 | 0.149 |
| FIN | 0.003 | 0.075 | 0.013 | 0.076 | -0.036 | 0.072 |
| FRA | 0.337 | 0.020 | 0.340 | 0.021 | 0.289 | 0.019 |
| GBR | -0.103 | 0.006 | 0.075 | 0.009 | -0.105 | 0.006 |
| GRC | -0.557 | 0.346 | -0.539 | 0.348 | -0.610 | 0.342 |
| HUN | 0.504 | 0.091 | 0.520 | 0.092 | 0.458 | 0.087 |
| IDN | -0.103 | 0.006 | 0.067 | 0.008 | -0.124 | 0.006 |
| IND | 1.672 | 0.364 | 2.297 | 0.401 | 0.952 | 0.323 |
| IRL | -0.453 | 0.104 | -0.427 | 0.112 | -0.464 | 0.105 |
| ISL | -0.323 | 0.046 | -0.287 | 0.053 | -0.318 | 0.048 |
| ISR | -0.299 | 0.046 | -0.205 | 0.049 | -0.312 | 0.045 |
| ITA | 0.519 | 0.018 | 0.538 | 0.018 | 0.463 | 0.017 |
| JPN | -0.166 | 0.015 | 0.051 | 0.016 | -0.190 | 0.015 |
| KAZ | -0.205 | 0.020 | -0.041 | 0.029 | -0.226 | 0.019 |
| KOR | -0.296 | 0.043 | -0.145 | 0.045 | -0.313 | 0.043 |
| LTU | -0.045 | 0.090 | 0.099 | 0.133 | -0.105 | 0.076 |
| LUX | -0.232 | 0.125 | 0.379 | 0.172 | -0.363 | 0.115 |
| LVA | -0.942 | 0.349 | -0.800 | 0.399 | -1.002 | 0.332 |
| MEX | -0.493 | 0.081 | -0.305 | 0.087 | -0.502 | 0.081 |
| MYS | -0.133 | 0.012 | 0.030 | 0.015 | -0.152 | 0.011 |
| NLD | 0.014 | 0.068 | 0.015 | 0.068 | -0.021 | 0.066 |
| NOR | -1.301 | 0.251 | -1.248 | 0.254 | -1.299 | 0.251 |
| NZL | -0.162 | 0.029 | -0.047 | 0.032 | -0.158 | 0.029 |
| PER | -0.943 | 0.180 | -0.821 | 0.186 | -0.954 | 0.179 |
| POL | -0.089 | 0.172 | -0.071 | 0.174 | -0.131 | 0.170 |
| PRT | -1.385 | 0.356 | -1.148 | 0.376 | -1.461 | 0.350 |
| RUS | -0.144 | 0.011 | 0.027 | 0.014 | -0.159 | 0.011 |
| SGP | -0.094 | 0.004 | 0.091 | 0.006 | -0.117 | 0.004 |
| SVK | -0.092 | 0.035 | -0.080 | 0.036 | -0.130 | 0.030 |
| SVN | 0.139 | 0.184 | 0.278 | 0.215 | 0.073 | 0.173 |
| SWE | 0.121 | 0.051 | 0.357 | 0.062 | 0.036 | 0.047 |
| THA | -0.146 | 0.011 | 0.040 | 0.015 | -0.169 | 0.010 |
| TUR | -0.256 | 0.039 | -0.044 | 0.044 | -0.239 | 0.039 |
| USA | -0.279 | 0.039 | -0.022 | 0.040 | -0.290 | 0.039 |
| VNM | -0.142 | 0.012 | 0.009 | 0.017 | -0.160 | 0.011 |
| ZAF | -0.215 | 0.023 | -0.013 | 0.027 | -0.236 | 0.023 |

Notes: The table present full general equilibrium effects for financial services relative to baseline and benchmark country which is the US. The STRIs are the actual and counterfactuals for communications services.

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