

TRADE IN TELECOMMUNICATIONS AND INTERNATIONAL TRADE AGREEMENTS

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Abstract

In light of recent technical and commercial developments in telecommunications, this paper discusses three related issues: First, to what extent is the GATS a suitable framework for liberalizing trade in telecommunications? Second, how does trade statistics capture globalization of telecommunications services? Third, how can the impact of trade liberalization in telecommunications be analysed? I argue that the sheer complexity and context specificity of best practice telecommunications regulations pose a challenge for including behind the border regulation in international trade agreements, including the GATS. Thus, international collaboration on developing and implementing state of the art pro-competitive and pro-growth regulation may be better placed with national regulators collaborating through specialized international bodies which have the necessary expertise. Preliminary empirical analysis suggests that while market access and national treatment stimulate trade and FDI in telecommunications, best practice regulation mainly improves domestic supply and indirectly supports trade both in telecommunications and services provided over electronic networks.

Bios

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Trade in telecommunications and international trade agreements

1 Introduction

The General Agreement on Trade in Services (GATS) was a pioneer in introducing legally binding competition policy provisions in trade agreements. The provisions are, however, limited to telecommunications. Thus, the Annex on Basic Telecommunications deals with behind the border regulation obliging members to ensure that foreign services providers can connect with local customers over electronic networks. In addition, WTO Members may include a Reference Paper on competition safeguards and regulated interconnection in their schedule of commitments.

Since the Annex on Basic Telecommunications came into force in 1998, the telecommunications sector has undergone a tremendous transformation from a largely state-dominated utilities-like network to becoming the core of the ICT revolution. Since the turn of the 21st century, mobile subscription rates have increased from 12 to 103 per 100 inhabitants globally, the share of the global population using the internet has increased from seven percent to almost half, while the fixed line subscription rate has declined from 16 to 13 per 100 inhabitants.¹ The decline in fixed line penetration rates largely reflects that developing countries' fixed line penetration rates were low when mobile telephony entered the market and quickly became the preferred access path.

Against the backdrop of the ICT revolution that has unfolded largely after the GATS came into force, this paper explores to what extent the GATS is still relevant for the telecommunications sector. In doing so, I compare and contrast the GATS provisions to chapter 13 in the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), the common regulatory framework on telecommunications in the European Union and applied regulation in 45 major economies. CPTPP is interesting because it represents a 21st century mega-deal, which includes a comprehensive chapter on telecommunications. The EU framework goes well beyond international trade agreements in harmonizing telecommunications regulation, and one could argue that it is outside the scope of an analysis of international trade and trade policy in telecommunications. However, the framework gives important insights on the dynamics and complexity of telecommunications regulation that should be borne in mind when negotiating regulation in telecommunications chapters in trade agreements.

The relevance of the GATS depend to a large degree on to what extent its provisions apply to current product and market conditions. The GATS schedules are based on a positive list of sectors that have been committed to trade liberalization. To help clarify which products and activities are included in the schedules, the WTO Secretariat developed a sector classification list, the W120, which is frequently used for defining the scope of commitments. The GATS, including the verified schedules, have status of international treaty which does not change frequently, while statistical

¹The numbers are from the World Development Indicators and compare 2000 to 2017, the latest year available.

agencies revise the classification of goods and services from time to time to capture changes in the range and nature of products available on the market. As a consequence, the definition and classification of telecommunications have become a contentious issue with legal implications.

The questions analysed in the paper are the following: Is the GATS framework still useful for negotiating future market openness in telecommunications? Should trade agreements focus on market access and national treatment and leave sector specific regulation to national regulators and international standard setting bodies? It is clear that commercializing and privatizing state-owned monopolies, which gained momentum in the late 1990s was essential for making the ICT revolution possible. It is also clear that a large number of countries committed these reforms in the GATS by scheduling telecommunications, including the telecommunications Reference Paper (Blouin 2000). Currently 108 countries have scheduled telecommunications in the GATS of which 82 have included the reference paper in their commitments.²

A preview of the findings are that, first, although pro-competitive regulation is needed to make market access a reality in the presence of suppliers with significant market power (SMP), there is a case for leaving the specifics of such regulation to regulatory bodies and specialized international institutions. This is because regulation of telecommunications is a highly technical endeavour and best practice regulation improves local supply independently of what other countries do. Second, best practice regulation evolves with technology, market structure and new insights, while trade agreements are usually not subject to frequent revisions. Third, market access provisions are related to higher import penetration of telecommunications services, while committing the Reference Paper is associated with more competitive telecommunications services, but has no discernible impact on imports.

The rest of the paper is organized as follows: Section 2 briefly describes developments in trade and market structure in the telecommunications sector. Section 3 discusses telecommunications in international trade agreements, comparing the GATS, the CPTPP and the EU common regulatory framework.³ Section 4 discusses how the regulatory principles in the reference paper and the CPTPP have been implemented in the OECD area as well as in major emerging markets using the OECD Services Trade Restrictiveness Indices (STRI) and database. The section also relates trade restrictiveness to trade and to performance in the telecommunications sector, while section 5 concludes.

2 Market structure and trade in telecommunications

At the time when the GATS was introduced, the telecommunications sector in most countries consisted of monopoly telecommunications operators. Their only business was to provide national and international voice calls and leased lines. Furthermore, transmissions were overwhelmingly analogue and mobile telephony was in its infancy offering voice services only (Cave, Genakos, and Valletti 2019).⁴ Major market developments since then include the digitization of telecommunications networks, the proliferation of high-speed and high-capacity fiber networks, successive

²See the WTO website for details.

³The EU regulatory framework applies to the European Economic Area, EEA, which comprises the European Union, Iceland, Lichtenstein and Norway.

⁴Both fixed and mobile telecommunications were measured in minutes. With information of price per minute and the number of minutes at hand, trade and local sales could be measured at current as well as constant prices in a straight forward manner. Major statistical agencies no longer provide data on minutes of international and long-distance telephone calls since transmission of signals are no longer billed by the minute.

generations of mobile networks and a shift from fixed to mobile services. OECD statistics show that average mobile broadband penetration rates across the OECD tripled during the decade from 2009 to end 2018 (from 31.5 to 109.7 per 100 inhabitants), while fixed broadband penetration rates increased from 22.6 to 30.9 subscriptions per 100 inhabitants during the same period. Furthermore, the average download and upload speed of broadband connections have increased steadily over the past decade, allowing more speed-sensitive content such as film and video conferencing to be transmitted over the internet and traded across borders.⁵

In recent years, bundling of services have become the dominant business model in the retail market. Thus, consumers buy a package of services (e.g. fixed line and mobile telephony and internet access together with TV subscriptions) from the same supplier at a flat monthly rate. Such triple play or quadruple play services are not only provided by telecommunications operators, but also ISPs and cable television operators. Consequently, products from different ISIC and CPC categories are paid for as a bundle in the retail market, which implies that revenue by sector and product is not recorded. Furthermore, the bundles that consumers purchase may be one side of two-sided or multi-sided markets where the other side (e.g. advertisers) subsidize the price of the bundle. Conversely, the services bundle may subsidize the price of hardware such as mobile telephones.

On the supply side, technological advances have led to changes in network design, most importantly the virtualization of networks and software-based networking. This brings new business models and relationships between telecommunications operators, ISPs, software providers and other communication services suppliers, in ways that are not yet picked up in e.g. input-output and use-supply statistics. As we shall see, such developments also need to be taken into account when assessing susceptibility to significant market power in the regulatory process.

Telecommunications are defined as the transmission of signals over electronic networks. An indication of real growth in the sector would therefore be how the volume of such transmissions evolves over time. Statistical agencies do not systematically collect data on electronic signals, but a number of consultancy reports suggest that the volume of data flows increases at an accelerating pace. McKinsey for instance, reports that the volume of international data flows has increased by a factor of 45 between 2005 and 2016.⁶ Growth in the volume of signals transmitted is not reflected in the revenues of telecommunications companies, however. To the contrary, as indicated in Figure 1, telecommunications revenue peaked around 2010 in the OECD area.

Declining revenues reflect both a change in the allocation of revenues between telecommunications operators and other firms in the communications value chain and plummeting prices. For instance, the US Bureau of Labour Statistics (BLS) reports that the price of wireless telecommunications has more than halved between 1997 and 2019 in the US, while the price of internet services has declined by more than a quarter during the same period. The price of fixed landline telephone services in contrast, increased by 20 percent during the same period.

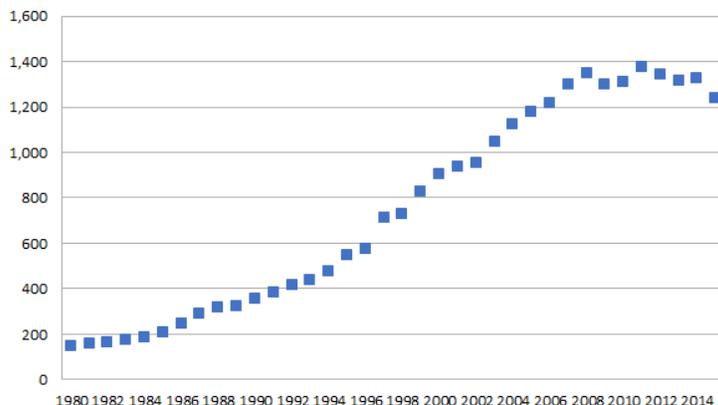
2.1 Trade in telecommunications

In the past, international transactions in telecommunications were governed by bilateral agreements between countries, often by state-owned telecommunications monopolies. In addition, the

⁵See for instance Akamai (n.d.)

⁶*GLOBALIZATION IN TRANSITION: THE FUTURE OF TRADE AND VALUE CHAINS* (n.d.) argues that international data flows are correlated with used cross-border bandwidth, available from Telegeography, a private firm.

Figure 1: Total revenue, telecommunications in OECD countries, USD bill



Source: OECD

ITU managed international transactions through a clearing system based on international accounting rates that involved a subsidy to developing countries with a significant imbalance between incoming and outgoing calls (Frieden 1990; Thuswaldner 2000).

Nowadays, telecommunications operators and ISPs in developed countries often engage in peer-ing, or so-called bill and keep contracts, which are settlement-free. In such cases, there are no financial transactions related to the wholesale flow of data and voice over telecommunications networks (Clark, Lehr, and Bauer 2016). International trade is defined as a transaction between a resident and a non-resident. Although it is not explicitly stated that the transaction has to be in financial terms, in practice trade statistics follow the money. Making consistent estimates of trade flows in the face of a plethora of contract types where transmission of signals and financial transactions are related in different ways is a challenge and it is not clear how this is dealt with by statistical agencies. Consistency across countries cannot be taken for granted.

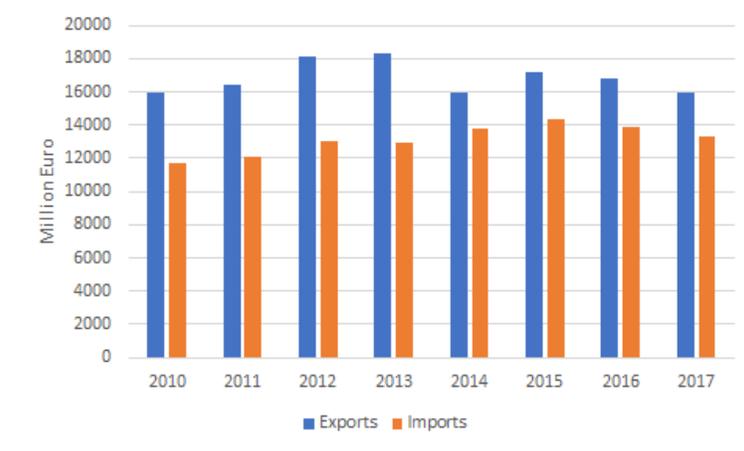
Among the major markets, the US and EU publish detailed data on trade in telecommunications services as well as information on foreign affiliate sales (FATS). I therefore focus on these two markets in the following. Figures 2 and 3 report trade and FATS data for EU while Figures 4 and 5 report the same metrics for the US. Information on inward FATS is only available for a few individual EU countries and not for EU as a whole, so EU data is limited to outward FATS.

We note that outward FATS is about six times larger than cross-border exports in EU and about four times larger in the US. In the US, inward FATS dwarf imports by a wide margin. Both the US and EU have recorded a peak in trade values around 2012-14 and a levelling off for FATS at about the same time. We also observe that both the EU and the US run a trade surplus in telecommunications, which has narrowed over time in the EU, but widened in the US. Finally there is a large gap between inward and outward FATS in the US.

2.2 Telecommunications and the four modes of supply

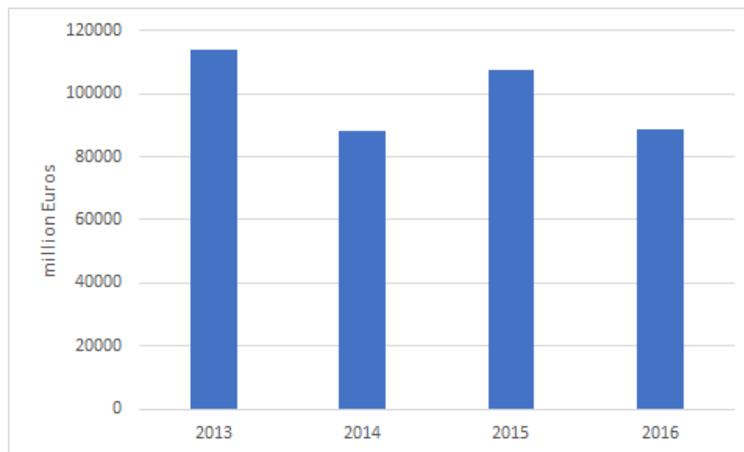
The four modes of supply as defined in the GATS are well-known and motivated by the fact that services do not pass through customs in a well-defined physical format. To meaningfully negotiate

Figure 2: EU trade in telecommunications services, Euro mill



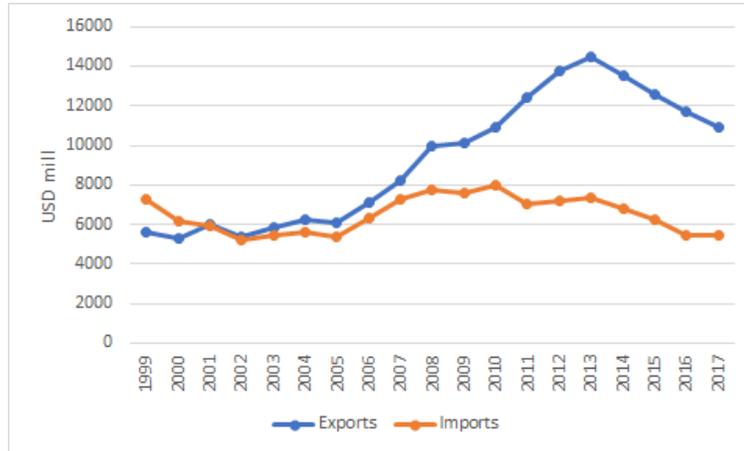
Source: Eurostat

Figure 3: EU outward foreign affiliate sales, telecommunications, Euro mill



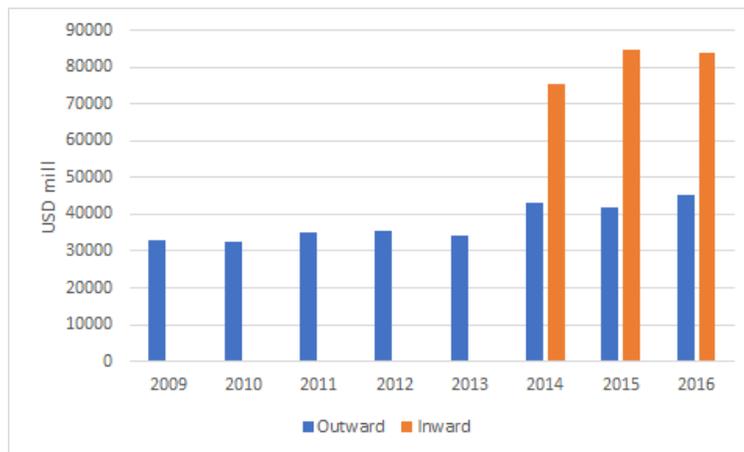
Source: Eurostat

Figure 4: US trade in telecommunications services, USD mill



Source: BEA

Figure 5: US foreign affiliate sales telecommunications services, USD mill



Source: BEA

rules on trade in services, the four modes of supply were defined based on studies on how services transactions actually take place. (Sampson and Snape 1985) The modes are cross-border supply (mode one), consumption abroad (mode two) commercial presence (mode three) and movement of natural persons (mode four). EBOPS trade statistics capture modes one, two and partly mode four. However, sales of foreign affiliates are not defined as trade, and are consequently not included in trade statistics.⁷ Eurostat and the WTO have developed a methodology and an experimental database on trade by sector and mode of supply. It uses available data on trade and FATS and then fills the gaps using different statistical and econometric techniques including predicting trade flows using the gravity model (Wettstein et al. n.d.). Telecommunications are aggregated with other information services, computer services and audiovisual services, which together constitute ISIC sector J. In this sector three quarters of trade was in mode three in 2005, while mode one accounted for about 20 percent. By 2017, the composition had shifted slightly, reducing mode three to about 70 percent while both mode one and four gained in relative importance.

The data experiment abstracts from the sector-specific issues related to telecommunications discussed above. Another hurdle appears when matching voice and data roaming to mode of supply. The literature has described roaming as an example of consumption abroad (mode two). However, if we follow the money and thus the transactions between a resident and a non-resident, the consumer pays the retail roaming charges to her mobile operator at home, which in turn pays the wholesale roaming charge to the foreign network on which she has roamed. In such cases, the foreign operator sells a service to the home operator, so that the latter can offer the consumer a seamless service across borders. From this point of view, roaming is closer to mode one. In cases where the consumer buys a simcard in the host country, in contrast, the transaction would fall under mode two. Within the European Union, regulation eliminated roaming charges in 2017. As a result roaming has soared, and related financial transactions have plummeted and roaming has disappeared from trade statistics. Capturing such developments in trade statistics would require new raw data which is outside the scope of the WTO/EU project.

New technology has led to changes in market structure where internet service providers (ISPs) and a host of content providers have developed their own infrastructure and compete head to head with telecommunications operators in transmitting signals by electromagnetic means. Furthermore, most major telecommunications operators are also ISPs. This creates problems for conducting impact analysis of the GATS on trade in telecommunications services. Changes in business models that disperse integrated economic activities and bundled products across several sets of specific commitments suggest that horizontal rules whenever feasible would better align trade agreements with business realities. Finally, although the GATS relies on the W120 in combination with the CPC, there may still be cases where the scope of the GATS is unclear.⁸

To summarize, recent years have witnessed structural changes both in the wholesale and the retail markets for telecommunications where new products and business models traverse traditional industry and product classification. Statistical agencies have updated sector and product classification to better capture such changes, but ISIC, CPC and EBOPS have not made strides to align statistics with trade agreements.⁹ Ideally, to analyze the impact of trade agreements one should

⁷Foreign affiliates are considered residents in their host country and sales from them in the host country are therefore transactions between residents. We note that sales of foreign affiliates often dwarf trade also for goods, but in line with balance of payment conventions, are not considered as trade.

⁸See for instance the Communication from the EC on classification of the Telecom Sector under the WTO-GATS Framework, TN/S/W/27 S/CSC/W/44, and (Delimatsis 2016)

⁹Although the Manual on Statistics of International Trade in Services (MSITS) does explain the four modes of supply.

gather information on the same markets and activities for which the provisions in trade agreements apply. The WTO/EU aims at realigning statistics to the GATS architecture, to make such analysis possible. However, although it is true that services are delivered through the four modes of supply, the same is arguably the case for goods and knowledge capturing products. The rationale for having a different architecture for trade agreements and trade statistics for goods and services is therefore unclear.

3 Telecommunications in international trade agreements

Most international trade agreements that cover trade in services have provisions on telecommunications that cover not only market access and national treatment, but also pro-competitive domestic regulation. This extension reflects the fact that trade liberalization would come to naught if an incumbent major supplier was allowed to deny entrants access to its network or foreclose the entry of competitors through exploiting its market power.

The GATS agreement represented a milestone in linking competition law to trade liberalization. Thus, the annex on basic telecommunications and the reference paper were among the first international instruments to introduce enforceable competition rules into a trade agreement. A number of FTAs have subsequently introduced telecommunications chapters that build on, extend and adapt the provisions in the annex and the reference paper to market structures and technology developments since the 1990s.

GATS commitments are made with reference to a specific sector and product classification, the W120. The definition of telecommunications therefore plays an important role in trade policy making and enforcement of regulation. International classifications distinguish between economic activities as recorded in for instance the national accounts, and the products that result from economic activities as recorded in e.g. trade statistics. Making a distinction between economic activity and products is not always easy for services, where the activity sometimes is the product, produced and consumed at the same time and in the same space.¹⁰ Also in this regard telecommunications are different as the output is separated from the provider and firms classified under other activities may also provide telecommunications.

Sector and product classification changes over time to capture technological developments, entry of new products and exit of existing products. For example, the fourth revision of the International Standard Industrial Classification (ISIC) in 2008 introduced an additional heading for communications services, capturing a host of new services in the digital economy. While earlier versions lumped telecommunications together with postal services as a subheading under transport and communication services, ISIC rev 4 categorizes telecommunications as a subheading under communication services. The new classification makes a clear distinction between creation, processing and storing, and transmission of digital content, where telecommunications are confined to transmission. The definition covers operating, maintaining or providing access to facilities for such transmissions. The most commonly used product classification for international trade in services is the Extended Balance of Payments Services Classification (EBOPS) 2010, which defines telecommunications as transmission of sound, images, data or other information, over electronic networks, including cable

¹⁰The four modes of supply reflect this feature of services as discussed in the next section. The W120 refers to activities rather than products, but offers a correspondence to the Central Product Classification (CPC).

television networks, but excludes processing of information and the value of the information transmitted. The activities listed in W120 remain the same, but the corresponding Central Product Classification (CPC) was last updated in 2015. It follows EBOPS in defining telecommunications (categories 841 and 842) narrowly as transmission of signals.

In the following I will compare the reference paper to the telecommunications chapter (13) in the CPTPP and to the regulatory framework for telecommunications in the European Union (EU). Important concepts in the analysis of telecommunications regulation are asymmetric regulation and major suppliers or suppliers with significant market power (SMP). Asymmetric regulation refers to regulatory obligations imposed on SMPs. As the purpose of regulation is precisely to foster entry into the market, entrants do not face the same obligations. SMPs are telecommunications operators with non-transitional and significant market power.

3.1 The GATS annex and reference paper

The GATS includes general obligations that applies to all WTO members and a set of specific commitments which are scheduled using a positive list approach. A positive list means that countries give market access and national treatment to all other WTO members in the committed sectors and modes of supply. To facilitate the request and offer process of negotiations and to clarify which activities are covered under each sector, the WTO Secretariat prepared a sector classification list, the W120, with concordance to the Central Product Classification (CPC). Although not mandatory, in practice commitments explicitly or implicitly relate to the W120. It distinguishes between basic and value added telecommunications services, where basic telecommunications mean end to end transmission of customers' information, and value added telecommunications include e.g. data storage and retrieval of customers' information in services such as on-line processing, on-line data storage and retrieval, electronic data interchange, e-mail and voice mail.

Returning briefly to the discussion of classification, basic telecommunications fall within the definition of telecommunications in ISIC, CPC and EBOPS. Some value added services, however, are no longer classified as telecommunications. Data processing and storage, for instance, fall under communication services (ISIC rev 4, 631 "Data processing, hosting and related activities; web portals"), while database services fall under Other information provision services in EBOPS.¹¹ If commitments were regularly updated to new versions of the CPC, this would probably not be a legal issue. However, as the discrepancy between the W120 and updates of CPC widens, political problems may arise about what countries intended to commit. To take an example. If a country has fully committed basic telecommunications and computer services, but not value added telecommunications, then the revision of the CPC would mean that they from that point in time are obliged to fully open some value added services.¹²

The WTO Annex on Basic Telecommunications obliges WTO members, whether or not they have scheduled telecommunications, to ensure that all service suppliers are accorded access to and use of public basic telecommunications on reasonable and non-discriminatory terms. This obligation not only relates to access for telecommunications operators from foreign countries, but to all services suppliers that wish to use telecommunications networks for transmitting services to their customers (Drake and Noam 1997). The telecommunications reference paper in contrast, applies to countries

¹¹"Hosting and information technology (IT) infrastructure provisioning services" under category 8315 in CPC includes several products that correspond to value added services in the W120.

¹²The dispute between China and the US on audiovisual services was partly about interpreting the classification of electronically provided audiovisual services.

that have scheduled telecommunications and included the paper in their schedule. It contains the following provisions:

- Competitive safeguards oblige the regulator to introduce measures that prevent SMPs from engaging in anti-competitive practices. Cross-subsidization, using information obtained from competitors strategically and withholding technical information are specifically mentioned.
- The regulator must require that SMPs, upon request, offer interconnection at any technically feasible point in the network at cost-oriented rates and otherwise non-discriminatory conditions. Interconnection negotiation procedures must be transparent and publicly available, and so must the interconnection agreements or alternatively a reference agreement. Finally, an independent dispute settlement body must be in place.
- Universal services, if any, must be administered in a transparent and non-discriminatory manner.
- Licensing criteria, where relevant, must be publicly available and the reason for denial of a license must be made known to the applicant upon request.
- An independent regulator must be established.
- Allocation of scarce resources such as spectrum, numbers and rights of way must be non-discriminatory, objective, timely and transparent.

The provisions mentioned under competitive safeguards are usually covered by the general competition law in most countries and covers all firms in any sector. Cross-subsidization is for instance typically captured by competition law provisions on predatory pricing. Using confidential information obtained from competitors is also covered by general competition law and legislation on protection of trade secrets.

The literature on regulation in telecommunications distinguishes between access and interconnection, although the terms are sometimes used interchangeably. When a distinction is made, interconnection means that two networks that operate at the same level of network hierarchy are linked, while access means that networks operating at different hierarchical levels connect and one network uses the other to originate or terminate signals. (Vogelsang 2003) The annex uses the term access while the reference paper uses the term interconnection, but neither offer a definition. If the aforementioned distinction applies, it appears that obligations to regulate access fall under the annex and are not subject to scheduling, while obligations to regulate interconnection apply if the reference paper is scheduled. The reference paper does not say whether or not interconnection obligations should be imposed in the form of asymmetric regulation. However, given that provisions squarely relate to SMPs, it appears that negotiators had asymmetric, ex ante regulation in mind.¹³

The obligation to establish an independent regulator was path-breaking at a time when incumbent state-owned suppliers had regulatory powers in many countries. Thus, independence in the reference paper meant independent from any telecommunications operators.¹⁴

¹³For further discussions on the reference paper and services classification see Peng (2016)

¹⁴In addition to market access and national treatment, the GATS also has an article on disciplines on domestic regulation (Article VI). The article envisages future negotiations on disciplines on licensing, licensing procedures and mutual recognition of qualifications. However, to date, such negotiations have not been concluded.

3.2 Chapter 13 in the CPTTP

Chapter 13 in the CPTTP captures and expands on the provisions in the GATS annex and reference paper. Articles 13.3 to 13.6 contain provisions that apply to all providers of public telecommunications and thus loosely correspond to the annex on basic telecommunications in their scope. Articles 13.7-13.15 relate to regulatory obligations imposed on SMPs, and thus covers the same area as the Reference Paper.

Starting with the general obligations that apply to all suppliers of public telecommunications, we note that the CPTTP does not make a distinction between access and interconnection. Thus, interconnection appears to apply to linking networks at the same level as well as different levels in the network hierarchy. The CPTTP includes a general obligation to ensure interconnection. New provisions in CPTTP are the obligation to provide number portability and a best endeavour clause to minimize impediments to mobile roaming. These include both an MFN clause on access to regulated roaming rates within the CPTTP area, if any, and minimizing impediments to using cheaper alternatives to roaming.¹⁵

The articles that relate to SMP obligations largely correspond to the GATS Reference Paper, although the CPTTP offers more specifics. For instance, regulators must not prohibit resale of public telecommunications services, and they also have a responsibility to ensure that SMPs offer for resale public telecommunications services in the retail market.¹⁶ To enforce SMP obligations, the CPTTP explains that a Party may engage in direct regulation, rely on market forces, or in principle engage in direct regulation but forbear from applying regulation to a particular service (Article 13.3). Direct regulation could reasonably be interpreted as asymmetric and ex ante.

The CPTTP defines an independent regulatory body not only as independent from any telecommunications operator, but also independent from government in cases where the government has ownership interest in a supplier of public telecommunications through the regulatory body. An example of such lack of independence would be if the incumbent is state-owned through the ministry of communications, which in turn serves as the regulatory body or the appellate body to the telecommunications regulator.¹⁷

The most important difference between the GATS and the CPTTP is that the GATS provides a positive list of commitments, i.e. only the sectors and the sub-sectors scheduled are subject to specific commitments and obligations, while the CPTTP takes a negative list approach, meaning that all services, modes of supply and provisions covered by the agreement, except scheduled reservations, are committed. Furthermore, the commitments do not rest on any particular sector classification. Finally, the CPTTP mandates that regulators impose interconnection obligations on all operators, while such obligations are limited to SMPs in the Reference Paper.

3.3 The EU regulatory framework

The EU regulatory framework is quite interesting due to its adaptability to changes in market conditions and technology and is therefore discussed at some length. Starting with definitions, EU distinguishes between "electronic communication services" and "information society services". The two services are governed by different directives and regulations, which define the services by their

¹⁵Of course mobile roaming was not much of an issue in 1998, when the annex went into force.

¹⁶As we will see below, the European Commission no longer sees a need to include resale among the regulatory tools used by national regulators in the EEA.

¹⁷The ITU defines independence of telecommunications regulators as independence from the operators, from other interested parties, and from other political actors for day-to-day matters.

functions and properties. Electronic communications services are defined as wholly or mainly conveying signals on electronic communications networks, and explicitly include telecommunications, while information society services refer to content i.e. a service "normally provided for remuneration at a distance, by electronic means and at the request of a recipient of services".

The EU common regulatory framework for electronic communication services was introduced by the Framework Directive of 2002.¹⁸ The objective of regulation is to foster competition, which means lowering the barriers to entry and preventing SMPs from abusing their market power. The ultimate objective is to establish end-to-end facilities based competition. The fundamental principle of EU regulation rests on ex ante asymmetric regulation, which is rolled back and replaced by ex post competition policy remedies when no longer needed.

Asymmetric regulation distinguishes between general provisions that apply to all firms operating in the market and specific obligations imposed on SMPs, which are identified through a prescribed process that involves both the Commission and national regulators. It begins with an in depth market analysis by the Commission, which identifies markets that are susceptible to SMPs. The starting point is to assess the strength of competition at the retail level, both the actual situation and a hypothetical situation were existing regulations to be removed. If there are competition issues that cannot be remedied by enforcement of general competition policy measures, the next step is to identify the related wholesale markets and determine whether an incumbent controls an essential facility in the related wholesale market. It is widely agreed that regulation should target the least replicable network elements. If this is not sufficient to prevent abuse of market power, the second to least replicable network element should also be regulated, and so on. The outcome of the analysis is a set of recommendations, the so-called SMP Guidelines.

National regulators undertake the next steps in the process. They analyze the local markets included in the SMP Guidelines every 3-5 years to assess the need for ex ante regulation, using a three-criteria test. These are: i) the presence of high and non-transitional barriers to entry, ii) the market structure does not tend towards effective competition within the relevant time horizon and iii) competition law alone is not sufficient to adequately address the identified market failure. Finally, the national regulator imposes specific obligations on the SMPs identified through the analysis, if any. The decision by the national regulator is reviewed by the Body of European Regulators for Electronic Communications (BEREC).

The 2003 SMP guidelines included 18 markets susceptible to significant market power that members should analyze and regulate if needed. Recognizing the dynamics of the telecommunications sector, the Commission completed a new market analysis in 2007. It concluded that ex ante regulation was no longer needed at the retail level and reduced the number of markets susceptible to SMPs to seven.

The third and most recent analysis followed in the early 2010s prompted by the roll-out of Long Term Evolution (LTE), which refers to high-speed wireless communications, the upgrading of cable infrastructure and deployment of fibre, new over the top (OTT) services and the transition from public switched telephone networks to IP-based systems, including voice over internet protocol (VoIP), and new access products such as virtual unbundled local access (VULA).¹⁹ The outcome was a further reduction of the number of markets susceptible to SMPs, bringing the number down

¹⁸Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services (Framework Directive).

¹⁹The Commission does not consider OTT services as alternatives to telecommunications services for the moment, but recognizes that this may change in the not so distant future. This, and the proliferation of 5G mobile networks will probably require an update of the SMP Guidelines.

to four.

The regulatory measures recommended for SMPs are a package of access and interconnection obligations at non-discriminatory, cost-oriented terms and conditions as well as transparency obligations. Typically, an SMP decision includes an obligation to offer non-discriminatory access to essential facilities at cost-based prices. A publicly available reference offer should spell out these conditions so that entrants and competitors can observe market conditions.²⁰ In addition, cost accounting and accounting separation are typically required so that the regulator can monitor the market and enforce regulation.

It is outside the scope of this paper to go into the details on which markets are regulated, why and when. We note, however, that the ultimate objective of EU regulation is to create end-to-end facilities-based competition subject to the general competition law and remedies. To obtain this objective, regulators may face a trade-off between static and dynamic efficiency. On the one hand access regulation contributes to static efficiency preventing SMPs from abusing their market power and facilitating the entry of new operators. On the other hand, mandating access at cost-oriented prices and non-discriminatory conditions may reduce the incentives for investing in new infrastructure both by incumbents and entrants. However, the empirical evidence on under which conditions access regulation strikes the right balance is mixed (Cave, Genakos, and Valletti 2019; Rajabiun and Middleton 2015). Some also argue that the market may well be more effective and efficient with less investment if infrastructure is shared and better utilized (Rajabiun and Middleton 2015). This issue has become more important with the introduction of 5G mobile networks, which requires heavy investment and first movers may gain market power. Finally, the EU regulatory framework amply illustrates how complex and context specific best practice regulation is. Thus, within the common regulatory framework EU members do their own analysis and impose their own national regulations.

3.4 Why definition matters

The GATS relies on a sector-classification list which is closely related to the positive list approach to commitments. As discussed, this may have rendered the agreement out of touch with business realities and created difficulties for impact analyses. CPTPP and EU define telecommunications services by their function and characteristics, which allows the scope of the agreements and regulations to evolve with technology and market structure. It does not imply, however, that everybody agrees on the definition. Two examples illustrate the point.

The first comes from the US where the regulator, the Federal Communications Commission (FCC) decided to reclassify broadband internet access services from information service to ISP in 2015 and then reversed the decision in 2018. The reclassification to ISP implied that internet access services became subject to regulatory obligations under Title II of the Communications Act, including ex ante access regulation. The reason given for reclassification back to information services was precisely to bring the services outside the scope of regulation, coining the decision the "Restoring Internet Freedom Order" (Webster 1950).

The second example is whether Skype is a telecommunication service or not. It was brought to court in Belgium in 2011 and from there to the European Court of Justice (ECJ), which released a preliminary ruling 5 June 2019. This judgment is so interesting in its reasoning and implications that I quote it in full:

²⁰Price regulation typically means a cap on wholesale access prices equal to the long-run incremental cost (LRIC).

"Article 2(c) of Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services (Framework Directive), as amended by Directive 2009/140/EC of the European Parliament and of the Council of 25 November 2009, must be interpreted as meaning that the provision, by a software publisher, of a feature offering a Voice over Internet Protocol (VoIP) service which allows the user to call a fixed or mobile number covered by a national numbering plan from a terminal via the public switched telephone network (PSTN) of a Member State constitutes an 'electronic communications service' within the meaning of that provision, provided that, first, the software publisher is remunerated for the provision of that service and, second, the provision of that service involves the conclusion of agreements between that software publisher and telecommunications service providers that are duly authorised to send and terminate calls to the PSTN."

The decision breaks down Skype services into its elements and map them to the definition of electronic communications service. The service in question, SkypeOut, ticks most of the boxes in the definition of electronic communication services and the court ruled that it is therefore subject to an obligation to notify the regulator about its activities.²¹ As we shall see in the next section, many countries require that public telecommunications operators must establish a local presence to be allowed to operate. If the ECJ's decision that Skype's services fall under telecommunications takes hold around the world, this would imply that the local presence requirement would apply to Skype and it would no longer be allowed to market and sell its service in countries where such a requirement exists without establishing there. Among the large markets where this would be an issue are all the BRICS as well as Chile, Korea, Mexico and Turkey.²² Both examples show that how a service is categorized determines whether or not it is subject to ex ante regulatory obligations. We also saw in the previous section that value added telecommunications services as classified under the W120 have moved to another, and less restricted category under the latest CPC update.

4 Applied regulation - the STRI

Comparing different regulatory options to assess their merits and unintended side-effects require comparable information on both regulation and trade. Furthermore, the trade and entry cost equivalent of the policy measures should ideally be quantified and matched with data on the affected activities. Since the trade policy commitments in the GATS are organized by sector and mode of supply, impact assessment would require information on trade by sector and mode of supply corresponding to the sector classification in the GATS. Such information does not exist.²³

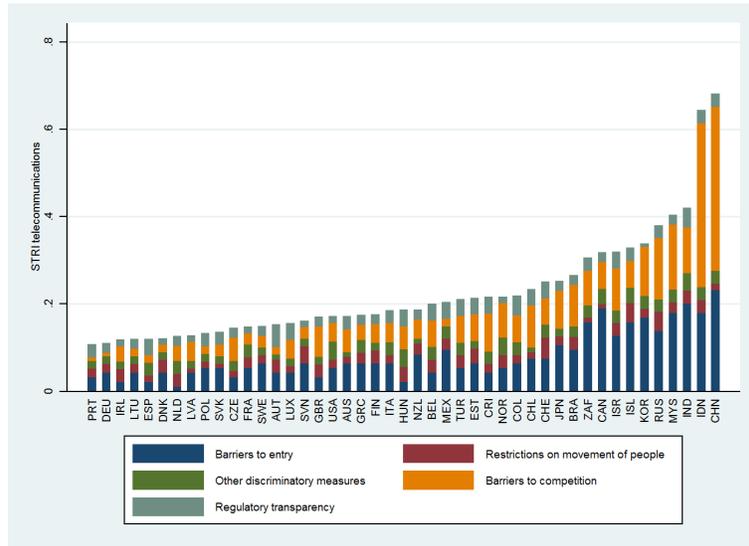
Applied trade restrictions specific to telecommunications are mainly found in two areas. First, a number of countries consider it a strategic sector and restrict foreign entry to ensure national control. Second, lack of adequate access and interconnection obligations may undermine market access. Access and interconnection regulation cannot easily be assigned to a particular mode of

²¹Skype refused to notify the Belgian government upon request, arguing that it is not a telecommunications company. This triggered the dispute in the first place. Also the French government has required that Skype register as a telecommunications operator since 2007.

²²Several EU countries have the same requirement, but here commercial presence within EU suffices.

²³As discussed in section 2, the WTO/EU pilot project on services trade statistics by mode of supply seeks to narrow this gap, although even these data do not have information on trade in telecommunications.

Figure 6: STRI score on telecommunications, 2018



Source: OECD

supply as it applies to international calls and data flows as well as roaming and services provided by foreign affiliates in the host country. Usually access and interconnection regulation is non-discriminatory and applies equally to foreign and locally owned operators. However, as we shall see, some countries allow for, and some even mandate discriminatory access or termination rates for international traffic.

In the following I analyze the impact of applied policy on trade and performance in the telecommunications sector using available data on trade and applied policy. Regulatory data come from the OECD database on services trade restrictions (STRI) in telecommunications. It records applied policies from domestic laws and regulations currently in force, including SMP decisions by national regulators. The STRI provides annual information for 45 countries from 2014 to 2018. The indices take values between zero and one, where a higher score indicates more restrictions and one represents a completely closed sector. The measures are organized under five policy areas as indicated in Figure 6. Barriers to entry cover market access restrictions in all modes of supply. Restrictions on movement of people capture restrictions to mode four and are usually horizontal, i.e. it applies to business travel and temporary entry irrespective of which sector the visitor calls on. Other discriminatory measures relate closely to national treatment. The policy area entitled barriers to competition captures access and interconnection obligations in addition to horizontal measures on state ownership, and redress in cases of abuse of market power. Finally, regulatory transparency captures administrative procedures related to obtaining a license, permission or visa where required, and public consultations during the legislation process. Figure 6 shows the scores for the 45 countries in 2018.²⁴

What is notable in this graph is the prominence of barriers to competition in the overall contribution to the score. The policy area contributes to about 40 percent of the overall restrictiveness index

²⁴The country codes reported on the horizontal axis are the ISO3 codes.

for telecommunication for all countries and all years, far more than for any other sector included in the STRI database. There is also significant variation across countries, where EU members tend to score at the low end while the large emerging economies have a high score. Barriers to entry also feature prominently. Among the 45 countries included, six still have foreign equity limitations, among them Canada, China and Korea. Other commonly found barriers to entry are residency or nationality requirements for board members, data localization requirements, and commercial presence requirements, the latter is found in 16 countries. Telecommunications used to be government monopolies in most countries. Today, the government controls one or more of the largest telecommunications operators in 20 of the 45 countries included in the STRI database. Control is exercised either through majority ownership, a blocking minority ownership, or special voting rights, i.e. a so-called golden share. This is recorded under barriers to competition together with access and interconnection obligations. Interconnection is mandated for both fixed and mobile services in all countries. Furthermore, all countries in the database impose access obligation to passive network elements and only two do not have the same obligation for active network elements in the fixed line markets.²⁵ Four countries do not require that SMPs make a reference offer public in the fixed line segment. All the OECD countries included in the STRI database mandate number portability both in fixed and mobile telephony, while six non-OECD countries do not have such a requirement for fixed line and only one country does not mandate number portability in mobile telephony.

Telephone termination rates are considered a monopoly since the connection to the consumer is operated by one supplier only.²⁶ Therefore, there is consensus among regulators that termination rates should be regulated as a competitive safeguard. There is one possible exception to this, which is when the receiver pays. Arguably in this case, the receiver controls access, and regulation may not be needed. All countries in the database regulate fixed line termination rates.

Interestingly, as many as 10 countries included in the STRI database, among them several EEA countries, allow operators to discriminate between local and foreign operators when it comes to termination or interconnection charges. A few countries have higher regulated wholesale prices for foreign suppliers, i.e. for terminating international calls. Others limit the scope of regulation to access and interconnection between domestic firms and sometimes foreign firms located in FTA partner countries. In such cases local SMPs are free to charge higher rates for international calls and other cross-border data traffic.

According to a ruling by the WTO dispute settlement body, discriminatory termination rates may be in breach of GATS commitments when the Reference Paper has been committed. The US brought a case against Mexico in which one of the complaints was that Mexico failed to ensure that its major telecommunications supplier provided interconnection of US cross-border suppliers on non-discriminatory terms and conditions at cost-oriented rates. The dispute settlement body ruled in favor of the US on this point.²⁷

Finally, 15 countries in the STRI database do not have an independent regulator. The criteria for independence in the STRI scoring system come close to the ITU definition. A country gets a clean score if the regulator is independent from any operator, has a mandate to enforce regulation on SMPs, and cannot be instructed or overruled by the ministry in its day to day operations within its mandate.

²⁵Passive network elements are non-electronic elements such as poles, masts, ducts or copper.

²⁶Termination rates are charges that a telecommunication operator charges another operator for terminating a call on its network.

²⁷See Panel Report, Mexico – Measures Affecting Telecommunications Services, WT/DS204/R, adopted 1 June 2004. See also Fox (2006)

We noted that the CPTTP has best endeavour provisions on roaming rates. No countries in the STRI database has imposed caps on roaming rates on an MFN basis, although the EU has eliminated roaming rates for the internal market.

Given the widespread adoption of provisions entailed in the Reference Paper and chapter 13 in the CPTTP, it may be surprising that barriers to competition still contribute as much as 40 percent to the overall restrictiveness in the sector. This stems from the best practice notion that a set of complementary obligations are needed to prevent SMPs from abusing their market power. According to the literature and best practice regulation, simply imposing access and interconnection obligations on SMPs is not effective unless accompanied by wholesale access price regulation and transparency obligations, including a reference offer, cost accounting and accounting separation. The STRI scoring methodology captures this by giving countries a clean score only if the whole package of regulation is in place.²⁸

4.1 STRI, trade and performance in telecommunications services

One would expect that trade restrictions are associated with less trade. Furthermore, open and well-regulated telecommunications markets are likely to perform better in terms of coverage, quality and prices. Finally, since telecommunications constitute the network over which digitized services are traded, one would expect that trade restrictions in the telecommunications sector have a negative spillover effect to trade in digitized services as well. This section explores these hypotheses.

Starting with the relationship between performance in the telecommunications sector and the score on the STRI, Figures 7 and 8 depict the correlation between the STRI for telecommunications and broadband density and secure server density respectively. In both cases I control for GDP per capita.²⁹

Both performance indicators show a strong negative correlation with services trade restrictions as captured by the STRI. The regression results indicate that a 10 basis points higher STRI score is associated with a 12 percent lower broadband penetration rate (R square 0.74) and 33 percent lower secure server density (R square 0.53). I also explored the relationship between performance and the two most important policy areas, barriers to entry and barriers to competition. The results suggest that barriers to competition have a stronger effect on broadband penetration rates than barriers to entry, while the two have approximately the same correlation with secure server density. It is important to bear in mind that correlation does not mean causality. It is quite possible that there is a two-way causality between regulation and performance. Given the methodological challenges in establishing causality, this is left to future research.³⁰ Comparable information on prices and speed is not readily available and the relation between regulation and this dimension of performance could therefore not be analyzed.

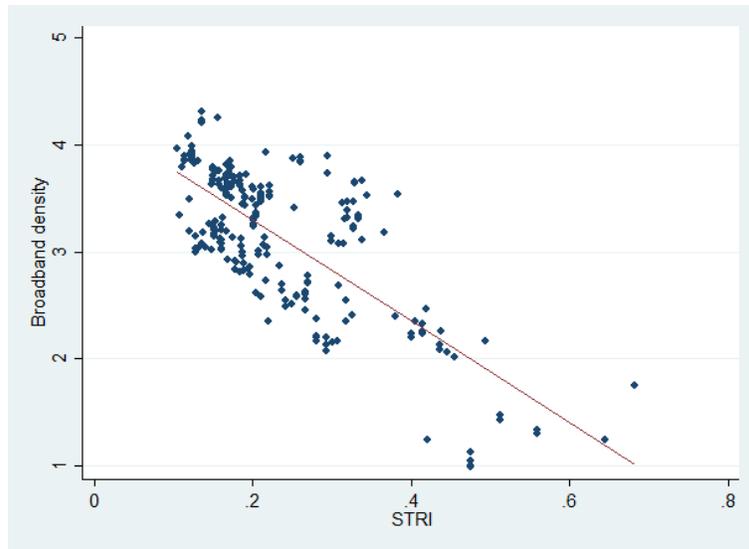
Turning to the relationship between trade restrictiveness and trade in telecommunications services, I apply standard gravity regressions. Trade in telecommunications services is regressed on the core gravity variables (log of income, log of distance and dummies reflecting social, political and geographical distance). The additional variable of interest is trade costs in telecommunications, represented by the STRI. In addition, I introduced a dummy taking the value of unity if the country

²⁸The STRI scoring methodology also includes a switch that makes lack of regulation a barrier to competition in the presence of an SMP, but not in its absence.(Grosso et al. 2015)

²⁹Data on broadband, secure server density and GDP per capita are from the World Bank Development Indicators. The log of broadband density and log of secure server density respectively are regressed on ln GDP per capita and the STRI using OLS with robust standard errors.

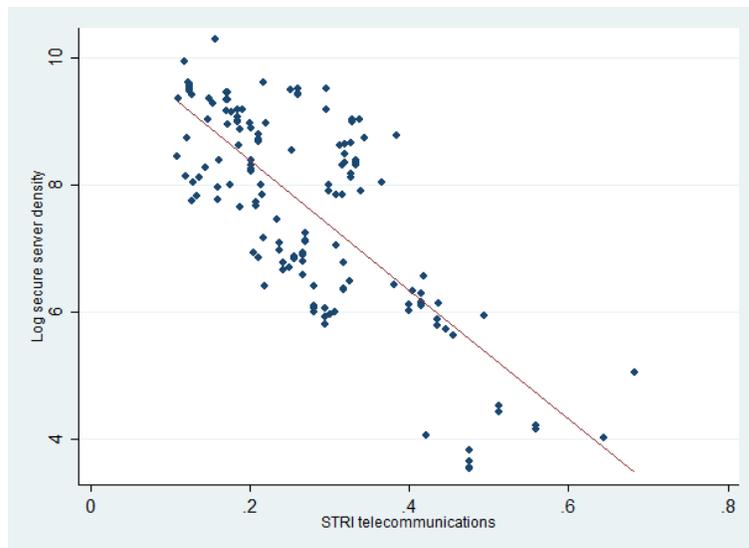
³⁰Establishing causality requires an identification strategy using instrument variables, which are difficult to find.

Figure 7: STRI and broadband subscriptions per 100 inhabitants, 2014-2017



Source: own estimate

Figure 8: STRI and secure servers per million inhabitants, 2014-2017



Source: own estimate

has included the reference paper in its GATS schedule and zero otherwise. The regressions are run using the Poisson pseudo maximum likelihood (PPML) estimator which has become standard in the literature.³¹ Standard errors are clustered on country pairs.

I use OECD data on bilateral trade in telecommunications services, which covers 43 reporting countries while all countries are included as partner countries.³² The standard gravity variables on geographic, cultural and institutional distance are from CEPII while information on GDP is from the World Development Indicators from the World Bank. Information on GATS schedules is from the WTO/World Bank I-tip database. Digitized services are found in most sectors, but business services are widely covered in the data and cross-border trade in such services are increasingly in a digital format. I therefore explore the relationship between the STRI in telecommunications and trade in business services to assess the role of telecommunications as the underlying transport means to other sectors.

International regulatory collaboration aims at developing and sharing best practice regulation. When successful, regulatory convergence ensues easing regulatory compliance costs for companies with international activities. Conversely, having to conform to different regulations in different markets adds substantially to trade cost, even if the level of restrictiveness of the regulation is similar across countries. The STRI toolkit includes a measure of regulatory heterogeneity, which compares country pairs, sector by sector, measure by measure and scores each measure zero if the two countries have the same regulation and one otherwise (H. K. Nordås 2016). Regulatory heterogeneity in telecommunications are entered in the regressions to capture the trade costs related to compliance with different regulation. Tables 1 and 2 report the results for trade in telecommunications and business services respectively.

We first note that the signs and the magnitude of the core gravity coefficients are similar to previous studies.³³ Furthermore, a high score on the telecommunications STRI is as expected negatively associated with imports of telecommunications services as well as business services, although the statistical significance of the latter is relatively weak. The coefficient implies that a 10 basis point increase in the STRI for telecommunications is associated with 18 percent less imports of telecommunications services at the mean. Regulatory heterogeneity is also negatively associated with trade in telecommunications services, albeit weakly, suggesting that harmonization of telecommunications regulation would stimulate trade.

Columns (2) and (3) break the STRI down on policy areas and introduce barriers to entry and barriers to competition separately. The results are quite interesting. While the overall STRI, as expected, has a negative impact on imports, barriers to entry affect exports of telecommunications services with statistical significance at conventional levels, but not imports. We recall that that the STRI measures trade and investment restrictions, which should primarily affect imports and inward FDI.

A possible explanation could be that barriers to entry indeed have a negative impact on inward FDI. A closer look at the restrictions recorded in the STRI database under barriers to entry reveals that the largest contribution are foreign equity caps, investment screening and a number of limitations on board members as well as data localization requirements. As is well known from the

³¹The regressions are run using country and time fixed effects. The STRI is country-specific which implies that it is collinear with country-year fixed effects, which could therefore not be used. The reference paper dummy is however country-specific and time invariant. To identify its impact on trade, I introduced country-year fixed effects in that regression, depicted in column (4) in Table 1.

³²Non-OECD reporting countries included in trade data are Colombia, Costa Rica and Russia, all of which are included in the STRI database.

³³See for instance (H. Nordås and Rouzet 2017).

Table 1: Gravity regressions, exports of telecommunications services

Variables	(1)	(2)	(3)	(4)
ln distance	-0.694*** (-6.89)	-0.695*** (-6.89)	-0.631*** (-5.57)	-0.602*** (-5.79)
Contiguous	-0.055 (-0.25)	0.056 (-0.25)	-0.004 (-0.02)	0.063 (0.31)
Common language	0.521** (3.24)	0.520** (3.23)	0.548*** (3.34)	0.572*** (3.58)
Common colony	1.712** (3.13)	1.713** (3.13)	1.733** (3.16)	1.741** (3.15)
Same country	0.350 (1.34)	0.347 (1.33)	0.330 (1.28)	0.242 (0.92)
ln GDP exporter	-0.900* (-1.98)	-1.020* (-2.33)	-1.007* (-2.35)	
ln GDP importer	1.471*** (3.34)	1.442** (3.10)	1.420** (3.14)	
Exporter STRI	-2.629 (-1.25)			
Importer STRI	-1.830** (-2.77)			
STRI heterogeneity	-2.663* (-2.05)	-2.621* (-1.99)	-2.013 (-1.59)	-1.418 (-1.44)
Exporter ref. paper				4.147*** (13.31)
Importer ref. paper				-0.421 (-0.63)
Exporter entry barriers		-7.791*** (-2.83)	-8.071** (-2.93)	
Importer entry barriers		-1.456 (-0.45)	-1.437 (-0.45)	
Exporter barriers to competition		-0.804 (-0.30)	-0.672 (-0.26)	
Importer barriers to competition		-1.413 (-0.82)	-1.363 (-0.80)	
Both EEA			0.408 (1.61)	0.329 (1.37)
Pseudo R square	0.829	0.829	0.830	0.844
N	2662	2662	2662	2703

PPML regressions with country and year fixed effects for regressions (1) - (3). Regression (4) includes exporter-year and importer-year fixed effects. Standard errors clustered on country pairs are reported in parentheses. ***, ** and * signify statistical significance at a 1, 5 and 10 percent level respectively.

Table 2: Gravity regressions, exports of business services

Variables	(1)	(2)	(3)
ln distance	-0.374*** (-6.16)	-0.374*** (-6.17)	-0.300*** (-4.14)
Contiguous	0.255* (2.02)	0.255* (2.02)	0.284* (2.07)
Common language	0.376* (2.23)	0.376* (2.24)	0.405* (2.44)
Common colony	3.915*** (14.43)	3.915*** (14.44)	4.001*** (14.07)
Same country	0.203 (1.29)	0.202 (1.29)	0.203 (1.30)
ln GDP exporter	0.684* (2.45)	0.625* (2.17)	0.629* (2.17)
ln GDP importer	0.197 (1.55)	0.201 (1.50)	0.187 (1.42)
Exporter STRI	0.528 (0.61)		
Importer STRI	-1.093* (-2.24)		
Exporter entry barriers		-2.594 (-1.37)	-2.814 (-1.48)
Importer entry barriers		0.591 (0.27)	0.291 (0.13)
Exporter barriers to competition		0.135 (0.15)	0.169 (0.19)
Importer barriers to competition		-1.163* (-2.00)	-1.043 (-1.69)
STRI heterogeneity	0.933 (1.03)	0.941 (1.04)	1.294 (1.44)
Both EEA			0.512* (2.50)
Pseudo R square	0.920	0.920	0.921
N	3732	3732	3732

PPML regressions with country and year fixed effects. Standard errors clustered on country pairs are reported in parentheses. ***, ** and * signify statistical significance at a 1, 5 and 10 percent level respectively.

literature, foreign-owned companies tend to export more than local firms. Hence, the negative impact on exports could work through a combination of less inflows of FDI and foreign affiliates' higher propensity to export. We recall from section 2 that mode three accounts for almost three quarters of trade in the broader communication sector, underscoring the importance of entry through FDI. Unfortunately, information on FDI in telecommunications is patchy and available for only a few countries, so at the moment it was not possible to explore this hypothesis.

Another interesting finding is that barriers to competition do not seem to have a statistically significant impact on imports or exports of telecommunications services, but is negatively associated with imports of business services, which depend on fast, reliable and cost-effective telecommunications. The lack of significant impact on imports is confirmed when using the reference paper as a measure of barriers to competition. However, having committed the reference paper in the 1990s strongly predicts exports of telecommunications services almost 20 years later.³⁴

It is also surprising that the dummy that takes value unity if both countries to a trade transaction are a member of the EEA and zero otherwise is not significant in the regressions, given the internal market and the common regulatory framework. It is possible that the impact is picked up by the regulatory heterogeneity variable, which turns insignificant when introducing the EEA dummy.

More work is needed to test the robustness of these results and to establish causalities. As noted in section 2, developments in prices, contractual relations and market structure have made it difficult to measure trade in telecommunications service in a consistent way across countries and over time, although country fixed effects should pick up systematic differences in measurement across countries.

Should the results hold up to further scrutiny, an interesting story emerges. First, as expected, services trade restrictions have a negative impact on imports of telecommunications services as well as other business services. However, breaking down the index on policy areas, it appears that market access limitations first and foremost impede inward foreign direct investment in telecommunications, which in turn has a negative impact on exports of telecommunications services. Policies aiming at lowering barriers to competition on the other hand, do not seem to have a statistically significant impact on import of telecommunications services. However, the policies seem to serve their purpose, i.e. to foster competition and thereby entry of new suppliers and higher density of modern telecommunications services at home to the benefit of consumers and business customers alike. In short, it appears that restrictions on market access and national treatment impede foreign investment in telecommunications, while barriers to competition mainly affect domestic supply.

5 Concluding remarks

This paper has analyzed the provisions in the Reference Paper on telecommunications in the GATS and compared it to the telecommunications chapter in the CPTPP and the common regulatory framework in the European Union. It is first noted that the reference paper is unique in bringing legally binding provisions on competition policy into an international trade agreement. Taking such an unprecedented step reflects the nature of the sector as a network with high barriers to entry and strong network effects; features that may render market access and national treatment obligations futile. In addition the importance of the sector as "the underlying transport means for other economic activities" as the WTO annex puts it, made open and well-regulated telecommunications services a priority.

³⁴A regression with country-year fixed effects and the reference paper for business services did not converge.

Telecommunications are characterized by rapid technical changes. New services that are complementary to or substitutes for existing services enter the market at frequent intervals, while other services are phased out over time. For example, telex, telegraph and facsimile services are included in the W120 and GATS commitments, but are not much in use these days. Furthermore, value added services as defined in the W120 are no longer considered telecommunications in recent industrial and product classifications. That said, the reverse is not true. The services classified as telecommunications in ISIC and CPC are also included in the W120. The GATS commitments may thus apply to a broader set of services than what is currently classified as telecommunications.

The EU regulatory framework as well as the CPTPP defines telecommunications according to their functions and characteristics. Both define telecommunications as transmission of signals and both draw a line between transmission of signals which falls under the definition, and the processing of signals and digital content, which do not. This way of defining the sector makes it easier to verify that decisions in border cases are consistent with the intention of the regulatory provisions. The example of whether or not Skype is a telecommunications service illustrates the point. The US reclassification of broadband internet access services also illustrates the importance of definitions for how a service is regulated, although in this case the service was reclassified with the purpose of removing it from the scope of ex ante regulation.³⁵

The GATS schedules apply a positive list for making commitments, which may have motivated anchoring it to a specific sector classification. Thus, when commitments to liberalize only apply to scheduled sectors, it is important to know exactly which activities are covered. The CPTPP, in contrast, uses a negative list, meaning that all sectors unless explicitly exempted are covered. There is no conceptual difference between a positive and a negative list as far as the depth of commitments are concerned. Nevertheless, the negative list is likely to be short and confined to a few sensitive products that can readily be defined without reference to a commonly agreed classification list. Furthermore, with a negative list new services are more likely to be automatically committed.³⁶

Turning to best practice regulation, the paper has shown that one size does not fit all. Best practice regulation evolves with technology and also depends on the market structure in each country. I have discussed the EU regulatory framework at some length. It is flexible and adaptable to new technology as well as new types of entrants. It is also forward-looking with the ultimate objective of creating the conditions for end-to-end facilities based competition. When and if successful, there will no longer be need for ex ante regulation of telecommunications and the sector will be folded into the general competition policy framework. So far the number of markets subject to ex ante SMP regulation has been reduced from 18 to four.

Chapter 13 in the CPTPP is flexible in a different way. Like the first EU SMP Guidelines, it includes a large number of activities that "shall" be subject to SMP regulation and obligations. However, while the EU framework has dropped ex ante regulation of the retail markets and also some wholesale markets, CPTPP maintains the activities that must be regulated but opens for regulatory forbearance. Should the signatories find that regulation is not necessary or that the costs outweigh the benefits, they may forbear direct regulation. Among measures mentioned under articles 13.7-13.14 in the CPTPP no longer under SMP regulation in the EU are resale of public telecommunication services and leased circuits. The CPTPP approach is flexible in the sense that it is consistent with deregulation. However, it does not encourage deregulation even when market

³⁵This may work when using a national classification list, but creates problems when using international standard classifications.

³⁶This is one of the reasons why a negative list is considered more risky when countries are not ready to fully open their markets.

conditions turn a regulatory provision from reining in SMPs' ability to abuse their market power to becoming a constraint on all suppliers and hence the diffusion of new technology and business models.

The telecommunications Reference Paper, in contrast, has no such dynamic perspectives whatsoever, and seems to rely on interconnection regulation in perpetuity.

The discussion of the common EU regulatory framework illustrate the complexity and resource-intensiveness of regulation, particularly when it comes to creating a regulatory framework that applies to a large number of countries with different market structures and levels of income. It requires frequent in depth market analyses, which in turn draw on technical insights and the research frontier on the economics of regulation. Developing a regulatory framework is thus highly technical, dynamic and context-specific. Including regulation beyond best endeavor general principles into international trade agreements runs the danger of making domestic reforms a bargaining chip that could become hostage to lack of progress in unrelated areas. Clearly, keeping up with best-practice regulation and deregulation in telecommunications is not a concession to trading partners, but in each country's best interest. Furthermore, competition policy mainly affect the the quantity and quality of domestic supply and its effect does not rely on trading partners making the same regulatory reforms.

Tentative conclusions are: i) trade agreements should focus on market access and national treatment. A telecommunications chapter could include best endeavour regulatory principles addressing access and interconnection and also reiterate non-discriminatory access conditions. ii) The technical details and standards are better dealt with in international fora for collaboration among regulatory bodies. Indeed, it should be borne in mind that the ITU, through standard setting and allocation of spectrum and satellite orbits has helped enabling seamless networks servicing all countries in the world since 1865. iii) Regulatory reforms should not be seen as a concession to trading partners. It is noted that regulatory reforms both in the EU and other countries covered by the STRI were undertaken unilaterally, and greatly improved performance in the telecommunications sector. iii) Finally, more work needs to be done on harmonizing the way financial flows between residents and non-residents related to transmission of electronic signals are recorded in trade statistics.

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