Trade Facilitation in Services

Concepts and Empirical Importance

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Abstract

This paper examines the concept of trade facilitation in services from the perspective of the recent literature on the determinants of services trade. The aim is to conceptualize trade facilitation in this area as a dimension of international integration beyond the baseline restrictiveness of policy, as captured by indicators of discriminatory market access. The analysis focuses on the role of governance structures, institutions, and transparency in shaping the environment for trading in services internationally. In addition to examining these factors, the paper provides some novel empirical estimates. Using a gravity model, the analysis finds that the ad valorem equivalents of common measures of institutional quality, governance, and transparency are larger relative to measures of sheer policy restrictiveness, frequently a significant multiple. The paper also shows that the ad valorem equivalents of data restrictions are of similar magnitude to policy restrictions in services. The conclusion is that framing discussions of trade facilitation in services around the concept of reducing trade costs—specifically those stemming from areas where improvement is needed in governance, institutions, and transparency—could potentially bring significant benefits in increased integration of the global services economy.

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Trade Facilitation in Services: Concepts and Empirical Importance

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1. Introduction

Even though services account for around 55-75 percent of total output and employment in many countries in the world, their contribution to trade is far less.¹ These numbers form a sharp contrast with respect to trade in goods. A great deal of explaining this gap relates to the fact that trading services is still costly. Due to the non-storability of services and the requirement for either the service supplier or consumer to move in order to make a transaction, trade costs in services have historically been much higher than in goods. Moreover, Figure 1 shows that over the past 10 years little evidence exists that points to a substantial decline of trade costs in services, despite advances being made in transportation and ICT technologies.

Many services that were unimaginable to be traded a decade ago are now able to be supplied across borders in one way or another (Gervais and Jensen, 2013). While technological progress, advanced transport networks and the amplified use of international supply chains have led to more services being traded, a big reason why services still suffer from low tradability is because of costly regulatory policies and procedures. In many parts of the world, market access restrictions in services are still high and, given that services markets are rippled with regulatory procedures as a result of structural and historical factors, non-discriminatory policies beyond market access have also remained substantial. Burdensome regulatory rules and procedures therefore form an important factor in explaining the high trade costs from which services suffer even though some policy reforms have made services more tradable in recent years.

This paper focuses on the latter aspect of trade costs in services. More specifically, the paper looks at how regulatory policies are implemented and administered, which for the most part (but not always) does not discriminate between domestic and foreign service suppliers, and can help reduce trade costs in services. As stated in Hoekman (2017), trade facilitating measures in services relate to costs that stem from (a) (asymmetric) information on the rules and requirements that apply to the delivery of the services; (b) the associated certification / conformity assessment process of the service, and (c) the uncertainty / variability in the administration (governance) of (a) and (b), such as related to procedures. What needs to be made clear in this context is that measures that fall into the area of facilitating trade in services (TFiS) are largely non-discriminatory in nature, but not always.

In short, regulatory policies that relate to facilitating trade in services center around how regulatory and administrative procedures have been implemented and conducted in countries’ jurisdictions. If compliance to regulatory rules and procedures is considered costly by service suppliers because of inadequate information, non-transparency, uncertainty and unclear documentation, this category of trade cost potentially forms a significant share of the overall trade cost in services. In some instances, TFiS measures can also entail discriminatory barriers such as visa measures which are inherently applied in a discriminatory manner. However, depending on how visa requirements are implemented, this policy area may therefore fall under the scope of TFiS. This paper conceptualizes and discusses the various aspects of TFiS-related measures in detail to provide clarity on what is covered by the TFiS agenda.

To date, domestic regulatory policies going beyond up-front market access barriers to facilitate trade in services are largely unknown. Contrary to the case in goods where over the years a clear trade

¹ This lower share of services in trade compared to output and employment in services remains even when taking account of the measurement issues that plague services trade data particularly in developing countries.
facilitation agenda has been developed, the question of what qualifies as a potential measure that facilitates trade in services remains unidentified. The core element of the concept of trade facilitation in services revolves around the administration and transparency of regulations. Regulatory measures dealing with facilitating trade in services would make it easier for foreign suppliers to access the domestic market for any given levels of (discriminatory) policy restrictiveness. As a result, one important component of a potential TFiS agenda is not to liberalize services markets by undertaking regulatory reform as such, but to improve the implementation and administration of policies that broadly relate to reducing information costs for foreign as well as domestic service providers so as to make it easier for them to access domestic markets.

Reducing trade costs by way of regulatory reform and implementing sound regulatory procedures forms an important factor in the economy. Previous research has shown that reform in services markets not only improves productivity performance of services markets themselves (van der Marel, 2012), but also further downstream in the economy, namely for those that use services as inputs (Beverelli et al., 2017; Arnold et al., 2015; 2011). If the costs of using services are higher than they would be in a competitive market environment where regulatory policies are conducive to an effective supply of the service, they will form a non-revenue generating (for the government) tax on the economy. The focus of this paper is to determine how and what type of regulatory policies dealing with the ineffective rules and administrative procedures for both domestic but in particular for foreign service supplies can contribute to lower trade costs, thereby facilitating trade in services and ultimately contributing to greater levels of per capita gains.

This paper is the first one to take a functional approach to the concept of TFiS and attempts to provide a policy-relevant definition of the concept. It does so by discussing TFiS theoretically and by taking the concept of TFiS to trade data in order to analyze how the various aspects of TFiS form an important costs factor for trading services. Only in this way can a more focused discussion take place on developing the potentially useful idea of facilitating trade in services within the global trading community and to determine on which measures to focus when practically applying a policy-relevant agenda. The paper is organized as follows. The next session sets out a discussion on the concept of TFiS by setting out what it actually contains. Section 3 provides an empirical analysis of the potential determinants of TFiS as per the discussion in the preceding section, while Section 4 places the outcomes in broader context. The last section concludes.

2. Conceptualizing TFiS: What is it? 2

Broadly, measures that fall within the area of trade facilitation in services relate to notions such as “transparency”, “regulatory practices”, “regulatory cooperation”, “regulatory coherence”, and “good

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2 A first attempt to conceptualize TFiS and to determine what measures fall under the concept of TFiS, with members of the epistemic community on trade in services, was made during a conference in March 2017. This conference was held by the World Bank in collaboration with the Government of India. This section draws on some of background materials and discussions presented during this event.
regulatory practices”. These are concepts that are often heard when discussing any potential measures related to TFiS.

A first important understanding of these ideas is that TFiS measures are thought of as being pragmatic in nature. They focus on how regulatory policies in services are implemented in a practical and applied manner. That is, some of the keywords above talk about cooperation, coherence and practices, which point out to the way in which governments have set up their regulatory framework within which rules apply effectively, rather than the type of distortion of the measure itself. The existence of the regulatory policy is not the focal point, but instead TFiS measures concentrate on how the measure is implemented in the country that is most effective, preferably in line with other countries to further reduce the cost of trading. By way of example, negotiating visa requirements for the temporary movement of natural services suppliers is unlikely to have the goal of letting them completely disappear (as opposed to say quotas), but the aim would rather be how to formulate them so that service suppliers are least affected by any unnecessary cost burden.

Moreover, several other understandings seem to fall under the concept of TFiS specifically, namely “effective market access”, “meaningful market access”, “administration of measures”, “enhancing predictability”, “enhancing certainty”. Although these ideas vary substantially across each other in terms of definitional coverage, one shared commonality is that they tend to focus on how practical the domestic regulatory procedures are, or in other words, how regulations should be dealt with by the services provider when entering the market. To give an example, even if the conditions to fulfill an application procedure for applying for a professional license might be clear, if the procedure is lengthy and subjectively set by the regulators across time, the regulatory condition “adds on” to the regulatory barrier as such so that it becomes uncertain for the service supplier what to expect. This uncertainty could deter trade from happening in the first place. In that regard, even though some regulatory barriers themselves might not even be all that burdensome, the way in which they are applied could make it difficult for service providers to adhere.

To a large extent, such regulatory conditions are related to how transparent the regulatory framework is set up for service providers, although not solely. Transparency about the way in which regulatory policies are developed, regardless of how burdensome they are, reduces the uncertainty service providers are faced with when entering a market. Transparent regulatory procedures would therefore facilitate access to the domestic market for domestic and foreign service suppliers at any given level of burdensome or discriminatory policy restrictiveness. Therefore, if the conditions of implementation and administrative process under which the regulatory policy applies are unclear and not easily understood by service suppliers, this lack of information of the regulatory policy itself forms an extra cost for market entry and operations because uncertainty exists.

However, an important point to bear in mind is that these concepts are not just about transparency alone, but about meaningful transparency. Just providing transparency of the rules and procedures is not enough even if they are set up in a simple way. Ideally, additional rules and procedures are implemented in a way that avoids any vagueness or ill-defined concepts so that little room exists for regulators to interfere or to have any other leverage over the process once the regulatory barrier applies to service firms. That can be done in two ways. One is by actively explaining the content of the rules and procedures to service providers so that the latter obtain meaningful clarity and are not just faced with a static representation of the rules and procedures. This could also be done by way of providing reasonings
for decisions, disclosing information on the procedures leading to decisions and forwarding regulatory plans in the making. Another way is to let businesses participate in the development of the rules and procedures, effectively influencing the outcomes through consultation meetings. That latter comes close to the concepts of effective transparency and effective market access.

In addition, reducing the scope of regulators to interfere with the regulatory process in a costly way or minimizing any other arbitrary regulatory leverage may also relate to the institutional quality in which regulators in services operate. Indeed, the empirical literature shows that the institutional strength and soundness of national governance structures are real determinants in improving services performance (Beverelli et al. 2018 and van der Marel, 2016). With respect to TFiS, this issue boils down to the institutional governance structure in which national services regulators operate as well as their institutional capacity (see also below). Regulators would need to be accountable for their decisions, be independent from any external political influence, but also have the regulatory capacity in terms of sharing a clear mandate, expertise (i.e. skills) and resources to propose, handle and evaluate regulatory policies that facilitate trade in services. All these elements focus on the governance framework in which regulators operate. A stronger institutional setting for the regulatory framework reduces the possibility of opaque and discretionary administration of laws and regulations.3

Taken together, therefore, measures that would fall under the scope of a potential TFiS framework would be (a) regulatory in nature while focusing on the processes and procedures of the regulatory policy aside the possibility that the policy itself may constitute a barrier, (b) related to how these regulatory processes and procedures may minimize costs related to the (asymmetric) information of the regulatory policy, and (c) go beyond the mere fact of transparency by effectively operationalizing it and by allowing stakeholders to obtain meaningful outcomes, which includes optimizing governance structures of the regulators that set the policy.

As a final remark, these concepts of TFiS measures are broad and relatively generic in nature as opposed to the regulatory policies themselves that may form a barrier. Regulatory policies such as market access and national treatment measures are often set at the sector level and are therefore sector specific. They do not always apply economywide. As such, a final important understanding of potential TFiS measures is that for our categorization of policies, an emphasis should be put on how policies are administered across all sectors, i.e. national-wide covering all services sectors instead of being related to a specific sector (although admittedly there is a fine line between the two).4

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3 Interestingly, Molinuevo and Sáez (2014) provide a checklist of good regulatory practices that contains many of the concepts and ideas that were discussed among experts, which can be found in Annex 1. In addition, the APEC-OECD Integrated checklist on Regulatory Reform also puts down some aspects that are relevant for how to develop regulations that facilitate trade in services and goods. Furthermore, Molinuevo and Sáez (2014) also set out in further detail what covers for regulatory mandate, capacity and resources of regulators related to their governance.

4 This discussion also involved the concepts of regulatory harmonization and Authorized Economic Operators (AEO), which are two items that are interesting in themselves, but merely serve as a means to overcome the burden of restrictive TFiS measures which are the focus of this project.
Modal aspects of TFiS categories of measures

Despite being economywide in nature, TFiS measures may nonetheless be specific to the channels through which services are traded. Services trade takes place through various so-called modes of supply (i.e. Mode 1 to 4) with each having its own regulatory setting. Modal-specific measures potentially relevant for the TFiS framework are often non-discriminatory in nature and target in many cases the business operation of the services supplier or the technology by which services are traded.5

For Mode 1, three issues are emerging as significant TFiS measures to trade, namely the cross-border flow of data, the importance of the open and interoperable systems and standards, and regulations surrounding cloud computing. Measures applied in these three areas would therefore directly impact the cross-border trade in services of which the vast majority is executed over the internet. Measures related to the cross-border flow of data would vary from outright localization requirements of data to be held within a jurisdiction to burdensome conditions put on the data that are transferred abroad. According to Ferracane and van der Marel (2018), these measures have a significant trade-reducing impact for services. Interestingly, these measures do not directly affect the service to be traded, but rather the technology (i.e. data and the internet) with which the service is traded.

Standards with respect to Mode 1 could be wide-varying and could form a potential barrier to trade even though there are legitimate reasons to uphold the policy for the purpose of quality control. However, standards also form a policy area in which much scope exists for regulatory cooperation between countries, and which is therefore relevant for a potential TFiS agenda. The purpose of negotiating standards would therefore be to formulate standard-related procedures in such way that they become least distortive and secure the exclusion of arbitrary changes in standards by regulators while achieving the non-economic objective of the services. Standards related to Mode 1 could include encryption standards that deviate from the international norm with respect to digital / data services. They could also relate to specific standards set for professional services. Existing regulations specific to cloud computing with a potential negative impact on services trade often revolve around how data are secured nationally to guarantee the privacy of the subject.

Mode 2 mainly covers services activities such as education, tourism and medical health consumed by the buying party going abroad. Potential TFiS measures therefore include entry formalities such as visa fees and procedures, insurance coverage when the consumer of the services is going abroad, advertising regulations for medical tourism and the certification / accreditation of hospitals and other service providers. In all instances, they may deter trade in a way so that the mobility of the consumer going abroad, or the consumption of the service abroad is obstructed. Note that in some cases these measures can be applied in a discriminatory manner (such as visa fees and procedures). In addition, if advertising and the associated marketing services are only permitted to locally-licensed service suppliers for

5 The four modes are Mode 1, which is cross-border trade in services, i.e. services supplied from the territory of one Member into the territory of another, e.g. software services through e-mail to another country; Mode 2, which is consumption abroad, i.e. services supplied in the territory of one Member to the consumers of another, e.g. education services in another country; Mode 3, which is commercial presence, i.e. services supplied through type of business or professional establishment of one Member in the territory of another; and finally Mode 4, which is the presence of natural persons, i.e. services supplied by nationals of one Member in the territory of another.
attracting medical tourism the regulation entails discrimination between the domestic and foreign medical service providers, although the regulations applies to the operations of the firm.

For **Mode 3**, there is an extensive list of measures that could potentially be classified as a TFiS measure. Moreover, there is an ongoing discussion at the WTO level on “investment facilitation” which has attracted significant attention.\(^6\) Besides the more generic items as provided above such as transparency, the predictability of rules and the efficient administrative procedures, the issue of **dispute prevention and resolution** as well as the quality of **investor-related services** are often mentioned as potential TFiS measures. Furthermore, other common subjects such as the **responsiveness of regulators**, and the **access to governments and regulators** queries and solving issues are also items that have been discussed in the context of facilitating services trade. These latter two concepts overlap with the topics discussed in the previous section on how regulators can actively inform and respond to service providers about the regulation in question and whether the regulatory process is well-organized and open for consultation with the private sector.

Under **Mode 4**, which covers the temporary movement of a natural person being the service provider, an important issue that appears to be of concern is the **contained discretion of regulators** in addition to the predictability and certainty of the regulatory procedures. In addition, TFiS measures in this mode also cover **visa fees**, **visa processing time and complexity** and **social security payments** (see Singhal, 2019). The role of the regulations has been discussed in the previous section and centers a lot around their quality and control. Indeed, the contained discretion of regulators covers in large part to the institutional strength of the regulatory body that sets the procedures and rules. One additional element in this respect, which is also applicable across all modes of supply, is how regulatory procedures are mapped so that deficiencies can be prevented in the preparation, adoption, and application of regulations (Molinuevo and Sáez, 2014). If the procedures for regulatory adoption and implementation are secured, it enhances the likelihood that policy makers improve the quality of the regulation and avoid any arbitrary modification of the administrative practice afterwards.

### Regulatory Heterogeneity

As given in the definition by Hoekman (2017), TFiS measures would also cover the **variability** in the administration of rules and requirements related to the delivery of the services as well as the processes for which a certification or conformity assessment is needed. In other words, the sheer heterogeneity of regulatory frameworks in services markets across countries also affects international trade costs, and therefore trade in services (see OECD, 2017).

Regulatory policies vary across countries for any given sector. They vary at two levels, namely at the level of market access and national treatment, i.e. when regulatory policies form an up-front restriction to trade in services, and at the level of domestic regulations. The heterogeneity of regulations is a problem for firms as the idiosyncratic nature of each country’s regulatory framework forms a set of fixed costs each time the company enters a different export market. As Figure 2 illustrates, these fixed costs that the firm needs to incur increase the average productive costs curve of the firm since it is prevented from reaching economies of scale and scope. Nordås (2016) shows that the costs associated with regulatory

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\(^6\) See Echandi and Sauve (2013) for a review of investment facilitation in services trade.
heterogeneity can be a significant impediment of services exports and that this impact is larger the lower the level of trade restricting regulation.

Once the up-front trade barriers of market access and national treatment have been eliminated, services and services providers / consumers should be able to move across the border under any mode of supply. In practice however, providing market access to the services or service provider / consumer comes along with the requirement to comply with domestic regulations, which in many cases may also diverge from one country to another. Even though the presence of the domestic regulations as such is not put into question as they often serve to achieve a legitimate (non-economic) policy objective, they can be significantly different between the country of origin and destination. This is a trade problem insofar this regulatory heterogeneity affects trade opportunities in services because of creating high costs that in fact could be easily removed. In other words, regulatory heterogeneity of regulations forms a trade cost burden in the event they unnecessarily limit trade because regulatory procedures are different.

By focusing on non-discriminatory policies only, Table 1 may clarify some of the issues related to the regulatory heterogeneity between countries and its alternative options. In the figure, both the vertical and horizontal axes measure whether any form of collaboration between the regulatory frameworks takes place or not between respectively the exporting and importing country – the latter being the exporting market. This regulatory collaboration can take shape in the form of “regulatory coherence”, “regulatory cooperation”, or eventually full “regulatory harmonization”. For the purpose of explanation, it does not matter for now how this regulatory collaboration takes place.

In the upper-left box of the table, no regulatory collaboration takes place at all. That means that maximum regulatory heterogeneity exists between the two countries. Services firms need to fulfill all the regulations required and adhere to the regulatory procedures due to a legitimate policy objective that is unrelated to trade or because of a clear up-front barrier to services when entering the market and / or to perform business operations. In this case, a firm needs to incur fixed costs as illustrated by the red in line in Figure 2. The opposite is true in the lower-right box when countries agree to collaborate and potentially harmonize their regulatory policies and procedures or come to an agreement to at least make their regulations coherent. This option can be achieved for instance by establishing a mutual recognition agreement (MRA) in which case both parties accept each other’s differing standards regime against a minimum commonly accepted set of core standards to which each of the two countries’ firms need to adhere. In this case, economies of scale are reached as demonstrated by the dotted blue line in Figure 2 because no fixed costs need to be incurred.

Note that when countries chose to cooperate or fully harmonize, a legitimate non-economic policy objective in each country may still exist, but it does not form a barrier to trade anymore as the two regulatory procedures have now been accepted or have become the same. Also note that now the burdensome barrier to services related to market access or national treatment (such as the right of establishment or local presence requirement) which may have been there before is also removed or has at least been substantially reduced. Clearly, the exporting country has an interest in moving from the upper-left box to the bottom-right box but has little margin to do anything unilaterally as the successful outcome of any regulatory collaboration depends on the partner country in question.

Intermediate scenarios are also possible. For instance, instead of making regulations coherent or harmonized, the regulators of each country may choose to collaborate in some softer form as illustrated in the lower-left box in Table 1. For instance, regulators may opt for exchanging information, update
each other of regulatory changes, and signify to each other when important changes in the regulatory system are likely to occur. This option however surely has a limited impact in terms of reducing international trade costs and will always require an engagement between the exporting and importing country. On the other hand, trade in services is also facilitated when the exporting country decides to unilaterally remove self-inflicted trade costs generated by burdensome regulatory procedures, obscure regulatory rules or by institutionally weak regulators as previously discussed. While cooperation is desirable, it is not necessary, and the trade facilitation agenda can be a complementary option for the country.

In sum, what can be said about trade costs in services is that they are generally made up of three components, which can be reduced by either the exporting or importing country or both, namely through (1) reducing or eliminating formal (explicit) barriers to trade as captured by market access and national treatment restrictions, which in fact can be discriminatory or non-discriminatory; (2) by taking actions to lower the costs for firms of complying with whatever regulatory processes and procedures that apply to providing services across borders, which also includes the quality of national regulators; and finally (3) through the regulatory collaboration of countries to attenuate the prevalence of regulatory heterogeneity across countries for given sectors or services activities. The latter two aspects only are related to the TFiS agenda whereas the former aspect is excluded from it.7

3. Empirical Analysis

The empirical section has two objectives. It will first review the empirical counterparts of the potential measures appropriate for TFiS as discussed above. Second, it will use the most relevant measures in the econometric assessment to estimate the extent to which each of the empirical indicators that capture the specific TFiS measure forms a significant trade cost determinant for trade in services.

3.1 Empirical Counterparts of TFiS Measures

Several existing data sources record relevant variables for our discussion, which together provide sufficient coverage for testing the significance of potential TFiS measures. The variables are a mix of country-broad and sector-specific measures – all recorded in publicly available international databases and freely accessible. In addition, the previous section also emphasized that various mode-specific measures are important for the concept of TFiS. This section therefore also takes into account the categorization of variables specific for all the four modes separately to the extent possible and will discuss them when applicable.

Country-broad measures

7 Note furthermore that what is excluded in addition when discussing potential TFiS measures are all infrastructure-related measures relevant for services trade such as human capital, skills and digital networks. The literature on trade facilitation in goods also makes this distinction between a “narrow” and “broader” set of constraints related to trade facilitation. As the reader might be aware, this paper focuses on a narrow set of TFiS measures.
Given that regulatory governance has been identified in the literature as a key enabling factor for services trade (Saez et al., 2015), which also comes out in our previous section, we first discuss this policy area. All variables discussed are country-wide and cover all sectors in the economy.

A first relevant source that records measures at country-wide level is on the quality and good regulatory practices from the World Bank’s Regulatory Governance database. This database records measures of transparency, civic participation, and government accountability across the life cycle of regulations of the entire economy. Given that the majority of most countries’ economies is comprised of services, this seems an important indicator. The explanatory note of this database uses concepts that come back under the key-words reported in the previous section such as meaningful transparency, effective market access and good regulatory practices. As well, the database explores how policy makers interact with stakeholders when shaping regulations affecting business communities, an element that was found of importance as described above in terms of operationalizing transparency with businesses.

The Regulatory Governance index includes the following main components on which the scores are based, namely (1) Transparency of rulemaking; (2) Public consultation in rulemaking; (3) Impact assessment; (4) Ex post review; (5) Accessing laws and regulations; and (6) Challenging regulations. All six categories seem important as all items deal with transparency that goes beyond the mere fact of transparency itself and that of effectively operationalizing it, such as allowing for public consultation in the rule making by requesting comments from the public, evaluating regulations by impact assessments, providing ex post reviews and conducting a regular review of the regulation.8

A second useful database is the World Bank’s Doing Business database. This well-known database provides objective measures of business regulations in 12 areas. Some of the areas record regulations of a specific sector such as construction (which in our case seems less relevant as measures need to remain economy-wide), but most of them are country-broad regulations targeting the entire economy of setting up a business. For our categorization of TFIS measures based on the discussion in the previous section, only three areas would be relevant, namely (a) Protecting minority investors; (b) Enforcing contracts; and possibly (c) Resolving insolvency.9 In large part, all three areas are related to investment measures and they can therefore be considered as mode-specific with respect to trade in services through Mode 3. In fact, the three sub-indexes measure businesses’ access to government institutions to solve investor and other contractual issues.

In particular the sub-components of the indicators of Protecting minority investors (i.e. a) and Enforcing contracts (i.e. b) coincide with the issues that are important for TFIS. They range from resolving issues of dispute, the use of good practices, dispute prevention and resolution, and investor-related services. Regarding this latter point, to some extent the area of Resolving insolvency (i.e. c) can also be considered as relevant here. This category measures the cost and outcome of insolvency proceedings involving domestic entities as well as the strength of the legal framework applicable to judicial liquidation and

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8 In a recently conducted survey by the World Bank among foreign direct investors, 86 percent find the legal and regulatory environment important or critically important for their investment decisions (World Bank, 2018).

9 Note that other areas of the Doing Business database are more sector-specific in nature such as “Dealing with construction permits”, “Getting credit” (i.e. banking services), “Registering property” (i.e. government services), and “Getting electricity”. Other country-broad areas are “Starting a business”, “Paying taxes”, and “Trading across borders”, which are either relevant for trade in goods or setting up a business and not necessarily to trade although some measures under “Starting a business” are also covered under the OECD STRI (see below).
reorganization proceedings. Half of this index measure is based on the implemented regulatory framework within which firms operate and therefore seems relevant for TFiS. Moreover, the general issue of “resolving [investment-related] issues” relevant for Mode 3 has also been identified as relevant by experts.

A third relevant database for potential TFiS measures is the World Bank’s Governance Indicators database. This database does not measure the quality and effectiveness of any regulatory proceedings themselves, but rather measures the quality and effectiveness of the institutions or the institutional framework as such. In that regard, the institutional dimension of this database sets it apart from the Regulatory Governance database as discussed above. To the extent that potential TFiS measures are related to the importance of the institutional strength and soundness of national regulatory bodies, two areas of this database seems of particular importance, which are (a) Regulatory quality and (b) Government effectiveness.

Regulatory quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Government effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies. Compared to the previous two databases, all the elements are broad in nature and, admittedly, their definitions seem close to the regulatory governance issues described above. However, one should note that the two indicators really measure the capacity of the government to effectively formulate and implement sound policies (see Kaufmann et al., 2010), not so much the process or implementation of the regulations as measured with the Regulatory Governance database. The two indicators are therefore closer to measuring items such as whether regulators are independent from any external political influence, have a clear mandate, expertise (i.e. skills) and resources to operate.

Several other country-wide sources exist which deal with regulatory governance and transparency in some way or another. However, each of them appears to be somewhat remote with regards to the purpose of categorizing regulatory TFiS measures per our previous discussion above. They are (1) the Transparency International index; (2) World Justice Project that covers areas such as regulatory enforcement, open government and civic participation; (3) Polity IV database and index that measures a country’s democratic institutions; and (4) measures of the Freedom House index that covers more political items rather than regulatory proceedings. They are not taken up in our empirical section.

**Modal-specific measures**

The more modal-specific concepts for TFiS measures that emerged as relevant relate mostly to Modes 1, 3 and 4. Empirical indicators for the latter mode are generally harder to find than empirical indicators of TFiS measures related Modes and 1 and 3. Potential TFiS measures relevant for Mode 1 centered around the issue of cross-border flows of data and the various policies that government have recently implemented to restrict the mobility of data between countries. There are two regulatory databases that

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10 Various empirical studies have also used measures from the World Bank’s Governance Indicators database to assess the quality of domestic institutions and regulators and their impact on (services) trade and productivity in services. See for instance Beverelli et al. (2017), van der Marel (2016) and Iooty et al. (2016).
trace and track the implementation of data localization and associated measures. One is ECIPE’s Digital Trade Restrictiveness Index (DTRI) (see Ferracane et al., 2018) and the other one is OECD’s Digital Services Restrictiveness Index (DGSTRI) (see Ferencz, 2019). They are therefore both relevant to measure the extent to which regulations in the area of data flows form a potential restriction for trade in services.

In particular, ECIPE’s DTRI covers specifically for various regulatory measures related to data. The regulation measures are split into two parts. The first part covers measures that impact the free mobility of data across countries; the second part deals with the domestic regulatory policies related to the domestic use of data inside a jurisdiction as provided in Ferracane et al. (2018), which also provides explanation of the full list of measures that fall inside the scope of the two parts, including how each measure has been weighted against each other. In addition, the DTRI includes several measures containing categories of restrictions related to cloud computing and digital standards as discussed in the conceptual part above. Ferracane et al. (2018) also provides a list of standards-related policy measures to internet technologies which therefore could have an impact on trade in services performed over the internet. However, it remains unclear to what extent these regulatory measures classify as a TFiS measure.

The OECD’s DGSTRI, which is specifically developed for measuring barriers in digital services trade as opposed to measures affecting all areas of digital trade (including internet technologies) as done by ECIPE’s DTRI, also covers measures on the cross-border mobility as well as standards on payment securities. Measures related to the cross-border mobility of data in the OECD’s DGSTRI are, however, recorded under a broader category of measures that also include regulations related to telecommunications and digital infrastructure, as well as restrictions on the use of communication services. The policies explicitly dealing with data flows are therefore harder to discern. Moreover, the index does not cover the domestic use of data as done by ECIPE’s DTRI.

Other measures relevant for the TFiS conceptualization of measures relate to the ones specifically mentioned regarding Mode 2 and Mode 3 (see above). However, available databases that contain relevant measures on these points such as visa procedures and insurance coverage are scarce and often non-existing yet. Nonetheless, there are two databases that express some cost dimension of visas, which are the Henley Passport Index and the Passport Index by Arton Capital. Given that these two indexes are broad-brushed and do not necessarily take stock of the level of visa fees (although they do cover when visa fees are exempted for their ranking), or the length and complexity of visa procedures, it is hard to exactly differentiate which components of these indexes qualify for a TFiS measure.

**Sector-specific measures**

The main databases that document sector-specific measures in services that would fall under TFiS are both the World Bank’s and the OECD’s Services Trade Restrictiveness Index (STRI). Both sources record restrictions in specific services sectors of which the OECD’s covers for a wider range of services and categories of measures. More importantly, the OECD’s STRI also incorporates various supplementary

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11 The World Bank STRIs have a greater focus on discriminatory policies than the OECD and cover a wider set of developing countries. However, the OECD includes more categories of measures that are non-discriminatory in nature and related to the business operations and / or domestic regulations, such as competition and transparency.
measures that relate to non-market access and non-discriminatory measures that are of particular interest for our TFiS categorization, namely measures related to (a) regulatory transparency and to some extent (b) barriers to competition.\textsuperscript{12}

In the category of Regulatory transparency, the OECD provides several measures of which many of them are in turn country-wide measures, although re-scheduled under each services sector for which it has relevance. Some of the measures are nonetheless sector-specific, for instance in the case of audio-visuals (whether IPR are effectively enforced) or construction permits (whether they are costly or not). In fact, most policy restrictions under Regulatory transparency are taken from the World Bank’s Doing Business database (see above) but do not necessarily overlap with the three areas as previously discussed, except for one or two indicators measured under the area of “Resolving insolvency”; other measures under Regulatory transparency relate to the areas of “Starting a business” and “Dealing with construction permit”.

In addition, for many sections the Regulatory transparency category also includes two other measures that are close to the ones as measured in the World Bank’s Regulatory Governance data set, which are: (a) whether regulations are published or otherwise communicated to the public prior to entry into force, and (b) whether there is a public comment procedure open to interested persons, including foreign suppliers. Besides, several measures under Regulatory transparency also deal with visas, namely the cost, number of days, and number of procedures it takes to obtain a visa. As such, these latter policy measures coincide with the TFiS concepts that are related to Mode 4 in our conceptual discussion above.

Regardless of the category of Barriers to competition, the OECD STRI provides a whole list of measures under each services sector but not all of them are of interest for the TFiS framework. Although many of them are non-discriminatory in nature, some of them have a discriminatory component and therefore seem less relevant. The relevant measures vary from whether government can overrule decisions by the regulators, whether decisions of the regulators can be repealed, whether there is a review of the regulation, whether there are fee settings and / or advertising restrictions (although not in health as discussed during the expert meeting but rather in professional services). Some of these policy measures are also addressed by the World Bank’s Regulatory Governance database as previously discussed.

To that end, all the sources mentioned above do attain to this requirement, including the ones that are outlined under the sector-specific sources such as the OECD’s STRI in the majority of the cases.\textsuperscript{13}

\textsuperscript{12} The STRI does not explicitly incorporate trade facilitation as a separate category of measure within the regulatory database or, by extension, the index. Part of the reason is that the rationale of the STRI is, for the most part, to collect data on formal laws and regulations only, as they are what governments typically negotiate in settings like the WTO, or for the purposes of regional trade agreements.

\textsuperscript{13} Having said that, the category of “barrier to competition” in the STRI contains some discriminatory measures and so would fall outside the scope of any TFiS coverage. For instance, for a typical sector, discriminatory measures in this category are: “When appeal procedures are available in domestic regulatory systems, they are open to affected or interested foreign parties as well”; “Foreign firms have redress when business practices are perceived to restrict competition in a given market”; and “Advertising and marketing: only locally-licensed architects are permitted to advertise and market these services”. For some services, these three measures are comprised of half of the total number of measures included. Measures on regulatory transparency are always non-discriminatory.
Regulatory heterogeneity

As discussed, regulatory heterogeneity forms a significant part of the total costs in services trade. Regulatory heterogeneity covers the variability in the administration regarding the rules and requirements that apply to the delivery of the services and the regulatory processes to adhere to between countries. To date, the most sophisticated empirical counterpart for measuring regulatory heterogeneity is the OECD’s Regulatory Heterogeneity index in services based on the OECD STRI (see Nordås, 2016). Given that the in this index, the entire OECD index is used, it includes both the up-front or explicit barrier to trade related to market access and national treatment as well as to the extent that STRI covers it the issue of regulatory transparency and barriers competition in services (see above).

The OECD’s STRI is specific to each country pair and indicates whether the countries have a similar regulatory frameworks in services or not. For each country pair and each sector, the indices reflect the (weighted) share of measures for which the two countries have different regulations. Note that in this respect, all categories of the OECD STRI are taken into account and not just specifically the areas of Regulatory transparency and / or Barriers to competition only. However, the OECD does have information on the level of regulatory heterogeneity for each of the five STRI components separately. Finally, the OECD developed two indicators of regulatory heterogeneity. One is computed on the basis of the qualitative answers as found in the database, the other one the basis of the actual index scoring.

3.2 Determinants of TFiS: Empirical Models and Results

In this section, we develop an empirical approach to help identify the relative importance of different factors as potential drivers of TFiS, by focusing on the determinants of cross-border services trade as indicators of the sources of trade costs that arise in a cross-border setting. The empirical counterparts of the core dimensions of TFiS developed in the previous section serve as a basis for the analysis, but some compromise is necessary. These are that data are only available for a relatively small sample of countries, and that many of the indicators have strong correlations among themselves, which make it difficult to obtain precise estimates if all variables are included separately in regressions. We therefore use dimensionality reduction techniques, such as taking simple or weighted averages of individual indicators to group them into a smaller set of relevant factors, using principal component analysis to determine the weights where applicable.

The most commonly used setup for empirical international trade analysis is the gravity model. Current best practice in the literature is Anderson et al. (2018), where the authors develop a simple method for both estimating parameters econometrically and conducting counterfactual simulations, all perfectly consistently with the constraints imposed by standard trade theory. Their starting point is the familiar structural gravity model derived from CES preferences across countries for national varieties differentiated by origin (the Armington assumption). The model takes the following form:

\[ X_{ij} = \left( \frac{t_{ij}}{\Pi_i \Pi_j} \right)^{1-\sigma} Y_i E_j \]
Where: $X$ is exports in value terms from country $i$ to country $j$; $E$ is expenditure in country $j$; $Y$ is production in country $i$; $t$ captures bilateral trade costs; $\sigma$ is the elasticity of substitution across varieties; $P$ is inward multilateral resistance, which captures the dependence of bilateral shipments into $j$ on trade costs across all inward routes; $\Pi$ is outward multilateral resistance, which captures the dependence of bilateral shipments out of $i$ on trade costs across all outward routes; $p$ is the exporter’s supply price of country $i$; and $\gamma$ is a positive distribution parameter of the CES function. Full details of the model’s solution and characteristics are provided by Anderson et al. (2018), and Yotov et al. (2017). We do not repeat them here, but direct interested readers to those papers for further details.

Most commonly, the model represented by (1) through (4) is estimated by fixed effects, which collapses it into the following empirical setup:

$$X_{ij} = \exp(T_{ij}\beta + \pi_i + \chi_j)e_{ij}$$

where: $T$ is a vector of observables capturing different elements of trade costs; $\pi$ is a set of exporter fixed effects; $\chi$ is a set of importer fixed effects; and $e$ is a standard error term. For simplicity, we are assuming that the model is estimated using data for a single year, which is in fact the case here due to limitations on data availability.

If the above model is estimated by PPML with fixed effects as recommended by Santos Silva and Tenreyro (2006), then Fally (2015) shows that the estimated fixed effects correspond exactly to the terms required by the structural model. In other words, if (5) is estimated correctly, then it follows that:

$$\Pi_i^{1-\sigma} = E_0Y_i \exp(-\pi_i)$$

$$P_j^{1-\sigma} = \frac{E_j}{E_0} \exp(-\pi_i)$$

Where: $X$ is exports in value terms from country $i$ to country $j$; $E$ is expenditure in country $j$; $Y$ is production in country $i$; $t$ captures bilateral trade costs; $\sigma$ is the elasticity of substitution across varieties; $P$ is inward multilateral resistance, which captures the dependence of bilateral shipments into $j$ on trade costs across all inward routes; $\Pi$ is outward multilateral resistance, which captures the dependence of bilateral shipments out of $i$ on trade costs across all outward routes; $p$ is the exporter’s supply price of country $i$; and $\gamma$ is a positive distribution parameter of the CES function. Full details of the model’s solution and characteristics are provided by Anderson et al. (2018), and Yotov et al. (2017). We do not repeat them here, but direct interested readers to those papers for further details.
Where: $E_0$ corresponds to the expenditure of the country corresponding to the omitted fixed effect (typically an importer fixed effect) in the empirical model, and the normalization of the corresponding price terms in the structural model.

For the above approach to work in a consistent way, it is important for the dependent variable, bilateral trade, to include all directions of trade. That is, it also has to include self-trade, production that is both produced and consumed in a given country, so that the estimated fixed effects in fact relate to the output and expenditure terms implied by theory. As a result, we use services trade data sourced from the OECD-WTO Trade in Value Added (TiVA) data set. To be clear, we do not use that data set’s estimates of value added components of trade, but instead simply take data on exports and production in gross shipments terms. The advantage of this source is that it contains harmonized trade and production data, so it is a simple matter to calculate self-trade: it is production less total world exports. Using the most recent version of the TiVA data set, we start with services trade and production data for 63 exporters and importers annually for the period 2005-2015.

In order to identify the impact of potential TFiS measures, it is important to control for the up-front policy restrictiveness in the sense of the set of measures that govern market access and national treatment in services markets. We use the OECD’s Services Trade Restrictiveness Index (STRI) for the importer to do this. Ideally, we would split out the sections of the STRI that deal with transparency and those that deal with market access in a pure sense; however, the two components of the index are strongly correlated, and it is not possible to obtain meaningful estimates when they are included separately. We therefore use the overall STRI. For the regressions using aggregate services trade data, we use PCA to produce a weighted average of STRIs across all sectors. We then also use selected sectoral STRIs where they correspond closely to sectoral definitions in the TiVA trade data.

The original STRI produced by the OECD only captured MFN policies in services (Geloso Grosso et al, 2015). Subsequently, however, the organization has produced measures of preferential policies for countries within the European Economic Area (EEA), essentially EU members, but not for other countries. We therefore merge these two data points into one STRI policy data index to take account of the special rules that govern services trade within the EEA, but include an RTA dummy as well (see below) to take account of the fact that coverage of preferential policies is not complete.

An important caveat for the data set assembled as described above is that it mainly includes developed countries and a small number of mostly large developing countries. Consistent trade and policy data are not available more broadly, due to consistent difficulties in reporting services trade data disaggregated by sector and partner country in many developing countries, as well as the continuing lack of a global database on services trade restrictiveness. We therefore use the broadest sample possible, but in interpreting results, this limitation in terms of sample breadth should be kept in mind.

**TFIS measures**

We can then move to consider the various indicators relevant to TFiS, as per the discussion in the previous section. To measure regulatory heterogeneity, we use the OECD’s index of regulatory heterogeneity, based on differences in answers to the regulatory questionnaire used to produce the STRI (see Nordås, 2016). As for the STRI itself, as explained above, we use PCA to produce a weighted average of sectoral measures in aggregate regressions, otherwise we use sectoral data where there is a close
correspondence between the policy data and the trade data. To measure policies that inhibit the free flow of data across borders, we use ECIPE’s Digital Trade Restrictiveness Index (DTRI) as developed by Ferracane et al. (2018). Specifically, we use the component of that database that captures restrictions on cross-border data flows in the importing country.

Moving towards more general measures of governance, we first take in the World Bank’s Regulatory Governance data. Specifically, we use the overall regulatory governance score based on the various components identified by the World Bank, again for the importing country. We also use data from the Doing Business project, specifically their index measures of the ease of doing business in three areas: investor protection, contract enforcement, and resolution of insolvency, all for the importing country. Again, we cannot enter the measures individually in the regressions as they are strongly correlated. We therefore take a simple average to produce a single measure of the business environment, as we believe it is relevant to TFIs. Finally, we use the regulatory quality and government effectiveness indices from the World Bank’s Worldwide Governance Indicators, all for the importing country. For similar reasons as those previously mentioned, we take a simple average of the two indices and use the result as an aggregate indicator of governance as we believe it might be relevant to TFIs.

The final element of the gravity model data set is a set of controls for geographical and historical linkages between countries, all of which come from the CEPII distance data set. Specifically, we include the logarithm of bilateral distance, along with dummies for country pairs that were ever in a colonial relationship, those that had a common colonizer, and those that have a common language as measured on an ethnographic basis. Finally, we include a dummy for membership of the same regional trade agreement (RTA), taken from De Sousa (2012).

In the discussion above, it is important to note that many of the variables of interest—all except the STRI and the regulatory heterogeneity indicator—vary at the country level; they do not vary at the bilateral level. Without modification, it would therefore be impossible to identify them separately from the importer fixed effects in the gravity model. But given that the gravity model includes intra-national trade data, it is possible to introduce bilateral variation by interacting the country-specific policy variables with a dummy for international trade observations, as per the approach in Anderson et al. (2018). The final element of the data set is therefore a dummy variable equal to unity for international observations, and zero for intra-national observations.

Applying the estimation technique discussed above to these data can provide indications as to which factors are the most important in terms of promoting bilateral services trade, after controlling for the restrictiveness of market access conditions. However, parameter estimates are not easily comparable across measures, due to differences in scale from one indicator to another. We therefore convert statistically significant estimates to ad valorem tariff equivalents (AVEs), by making use of the relationship in the theoretical model between individual factors and overall bilateral trade costs. In other words, we convert meaningful (i.e. statistically significant) results into their trade cost equivalents, compared with a baseline of maximum possible performance, to give an indication at the country level of the impediments to services trade posed by different factors.

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14 We have also run our preferred regression specification with Doing Business data on ease of paying taxes, as an additional factor that could plausibly affect cross-border trade in services. However, results are qualitatively unchanged. We therefore report the simpler version with fewer sub-variables here.
To make the conversion, we follow Benz (2017) but adapt his method slightly as per Shepherd et al. (2019). In this framework, the AVE in percentage terms is calculated as follows, using the STRI as an example (where beta is its estimated coefficient from the regression model):

\[ AVE = 100 \times \left( \frac{\exp(-STRI) \times \beta}{1 - \sigma} - 1 \right) \]

Given the elasticity parameter is not observed, we follow the OECD in setting it equal to 3. Final values of the AVEs are sensitive to this choice, but the ordering of countries and factors is not. This calculation can be repeated for each component of the trade costs equation that has a statistically significant coefficient in the preferred model, so that results can then easily be compared across factors. Variable definitions and sources for the gravity data set, based on aggregate services flows, are in Table 2. Summary statistics follow in Tables 3a and Table 3b.

We first run the regression using data on aggregate (total) trade, using the approach set out above. Results are in Table 4. We approach the problem by successively adding variables, starting with a simple gravity model without policy variables in column 1, then adding each explanatory variable individually. Results in column 1 are typical for gravity models using trade in services data, with all explanatory variables having signs, magnitudes, and statistical significance in line with what is seen in the literature. It is worth noting that R2 is reported net of fixed effects, which is why it is lower than is typical for gravity models. In column 2, we add the first policy variable, namely the STRI, which controls for market access conditions and to some extent regulatory transparency as discussed in the previous section. As expected, it has a negative and 1% statistically significant coefficient, which means that more restrictive policies (i.e. a higher index score) are associated with a reduction in bilateral trade.

In columns 3 through 7, we add the variables that are relevant from a TFiS perspective. The first is regulatory heterogeneity, which does not have a statistically significant coefficient. The reason is that it is strongly correlated with the STRI, in particular given that we have included preferential data for EU countries in this model. The next column adds the DTRI, and it has a negative and 1% statistically significant coefficient, which is in line with expectations. The model therefore suggests that higher restrictions on cross border data flows, as one element of a broader transparency agenda (particularly for Mode 1) tend to reduce bilateral trade. The next two columns introduce data on regulatory governance and the business environment respectively, but their coefficients are not statistically significant. The reason is that they are correlated with the STRI. However, the last variable to be introduced, which captures the general governance environment, has a 1% statistically significant positive coefficient. In other words, better governance (i.e. a higher score) is strongly associated with increased bilateral trade.

Moving from column 2 to column 7, the coefficient on the STRI remains negative and statistically significant at the 10% level or better in all cases. However, the magnitude decreases consistently as the TFiS indicators are added. In other words, part of the effect of policy that is found in standard models of services trade is arguably not due to pure restrictiveness, but to the broader set of regulatory, governance, and transparency issues that we have identified under the TFiS discussion in the previous
section. Our preferred results are in column 7, where the STRI, DTRI, and WGI variables all have statistically significant coefficients. While their signs indicate that they all have the expected impact on bilateral trade, it is important to be able to compare them in terms of quantitative importance. To do that, we convert them to AVEs for each country pair (since the STRI varies bilaterally due to EU preferential data), then take the simple average at the country level.

Results are in Table 5. The first three columns report AVEs. The fourth shows the total effect of measures related to TFiS (the sum of columns two and three) as a percentage of the AVE related to policy restrictiveness (column 1). Focusing on the last column, we can see that for all countries in the sample, the trade cost impact of measures related to TFiS is much higher than that due to straightforward policy restrictiveness. The difference is at least 1.5 times and is frequently much higher. The evidence therefore strongly suggests that policies that do not affect traditional market access, but which nonetheless increase transparency and improve regulatory governance in a non-discriminatory fashion, would have great potential to reduce trade costs in services and thereby boost bilateral trade. Figure 3 shows that in particular many middle-income countries would benefit from improving institutional governance as proxied by the WGI given that their AVE in this area is comparatively big.

The final part of the empirical exercise consists of re-estimating the model from Table 4 column 7 using sectoral data. This exercise is necessarily approximate, as the sectoral definitions used to construct the STRI are different from the definitions used to record and harmonize the trade and production data. We can therefore only identify four sectors where there is a close enough correspondence to make the analysis meaningful: finance (using the commercial banking STRI), computer services (using the computer services STRI), transport (using the maritime transport STRI), and telecom (using the telecom STRI).

Results are in Table 6. There is substantial variation across sectors, including some counterintuitive coefficients that are statistically significant. The STRI, as an indicator of market access restrictions, has a particularly large effect in financial services and telecom, but no significant effect in the other two sectors. In terms of the TFiS indicators, regulatory heterogeneity has a counterintuitive coefficient in all regressions, but the DTRI, regulatory governance, and the WGI indicator all have statistically significant coefficients with the expected signs in three of the four regressions, although the particular sectors vary. Doing Business has counterintuitive coefficients in three of the four cases, although it gives the expected results in transport.

The net result of the regressions in Table 6 is that there is substantial evidence of cross-sectoral heterogeneity in the impact of TFiS measures relative to market access measures captured by the STRI. In general, zooming down to the sectoral level seems to be associated with stronger impacts across the board, but there is substantial variation in signs, significance, and magnitudes across sectors. As always with sectoral services trade data, which are often poorly measured, it is difficult to draw strong conclusions. We therefore summarize the results by emphasizing that the impact of TFiS measures could differ substantially across sectors, so from a policy perspective it will be important to identify interventions that have the largest effects not only at the aggregate level, but on particular sectors.
4. Discussion

The empirical results found in the previous section merit some further discussion. As a general observation and as visible in Figure 3, a large part of total trade costs in services appears to be driven by the non-discriminatory aspect of trade policy which form part of the TFIS agenda. True, even though the categories of Regulatory transparency and Barriers of competition as part of the OECD STRI cannot be distinguished from discriminatory Market Access measures, the fact that two additional TFIS measures provide clear significance in the empirical estimations points out that many so-called non-discriminatory behind-the-border measures determine trade costs in services and therefore facilitate trade in services. This result confirms empirical findings in previous works that also assess trade cost policies in relation to services trade (e.g. Miroudot and Shepherd, 2014; Nordås and Rouzet, 2015).

However, our findings suggest not only that behind-the-border measures are important, but that the bulk of that these non-discriminatory trade costs factors must be found in the governance structure of a country. Our results show that the strongest cost variable explaining services trade is captured by the two World Bank governance indicators, and not so much behind-the-border measures covered by the World Bank’s Doing Business and Regulatory Governance indicators. The two governance indicators typically measure a country’s institutional capacity regarding policy frameworks and as such, when viewed from the perspective of services, are in our view more related to the regulatory institutional capacity of a country. Hence, to the extent that key words such as effective and meaningful market access, transparency and regulatory certainty matter for TFIS, our results show that they mainly appear to matter with respect to the institutional strength of governments and regulators dealing with behind-the-border policies in services.

Moreover, the institutional regulatory governance in services matters comparatively more for countries with lower levels of development when put in comparison with their market access policies. In other words, at any given the level of market access restrictions in services, the institutional component of the regulatory framework in which governments and regulators operate is becoming more important for services trade in less developed countries. This can be seen in Figure 4 in which on the horizontal axis the relative importance of the AVEs for the WGI variable is taken as a ratio over the AVEs for the STRI (left-hand panels) and the DTRI (right-hand panels). For each set of panels an economic performance indicator is plotted on the vertical axis. The panels clearly illustrate a negative relationship in the sense that reform in institutional governance in services become relatively more meaningful for countries with lower levels of GDP per capita, services productivity and services trade.

Another new finding is that compared to previous literature the policies with regards to data are in addition found to be important cost factors that facilitate services trade. The AVEs show that these behind the border measures can be as large as up-front market access regulations as mostly captured by the OECD STRI (Figure 4). Previous work has largely omitted this type of domestic regulatory policy. However, it should be noted that the empirical part of our analysis uses cross-border trade in services performed over the internet. When using services trade flows through foreign affiliates (i.e. Mode 3) instead, results might be different. That said, Andrenelli et al. (2018) show that some services are increasingly traded through Mode 1 as opposed to Mode 3 such as Publishing, Distribution and Financial services. These services are typically measured as very software-intense as shown by Ferracane and van der Marel (2018), being significantly impacted by data policies.
The fact that we have used cross-border trade in services in the empirical analysis does not necessarily mean that the policy variables that remain insignificant are unimportant. Admittedly, net of any potential trade complementarities between Mode 1 and Mode 3, the categories covered by our Doing Business indicator mainly affect foreign investors (i.e. Protection minority investors and Resolving insolvency) that operate and trade through foreign affiliates. To some extent this is also true for the various policy measures covered by the Regulatory Governance index such as consultation meetings, the possibility of accessing laws and regulations and the right to appeal by firms.

To sum up, to the extent that potential TFiS measures are (a) regulatory and non-discriminatory in nature targeting the operations of the services firm, and (b) go beyond the mere fact of transparency by effectively operationalizing, our results show that transparency measures (as covered by the OECD STRI category of Regulatory transparency), regulatory measures related to the cross-border movement of data and institutional regulatory capacity are important determinants for a TFiS agenda.

5. Conclusion

Trade costs in services are caused by a host of factors, not in the least place by market access and national treatment policies. However, an increasing body of research shows that a battery of non-discriminatory policies in services affect trade in services, which are domestic regulatory in nature. These policies often touch upon the regulatory sovereignty of a country and not seldom relate to a market failure in services markets. For example, in many countries the perceived regulatory need to localize data in large part originates from the concern of the privacy of the individual. Similarly, burdensome certification procedures in some countries need to be seen in light of the quality guarantee that governments want to secure. However, in many cases domestic regulatory policies can be unnecessarily strict, preventing trade from happening not because of any discriminatory preference, but because they generally impede services trade.

This paper shows that besides market access policies, three types of other domestic regulatory policies hamper the facilitation of services trade, namely transparency measures (as covered by the OECD STRI category of Regulatory transparency), regulatory measures related to the cross-border movement of data, and the institutional regulatory capacity of governments and regulators. In particular the latter category of regulatory measures has a large impact on trade and therefore forms a major determinant for the total trade costs countries encounter when accessing markets abroad. Moreover, this category of trade costs related to institutional governance becomes more important for countries with lower levels of economic development in services. In part this reflect lower income countries' levels of institutional capacity, which therefore may explain the implementation of high market access barriers in the first place. However, our analysis also reveals that irrespective of any level of discriminatory barrier, reforms of the institutional setup of regulators are likely to have high pay-offs especially for lower income countries.

Future research in this area can take several directions. First, in our view it is not entirely clear why other transparency measures that relate to specific regulatory procedures do not have a significant bearing on trade in services – and therefore do not form a meaningful factor for trade costs in services. One potential reason is that effective procedures (i.e. “effective market access” or “meaningful transparency”) are implemented precisely by countries as a result of their strong institutional governance structures. Another reason could be that they relate more to Mode 3 trade, and not Mode 1
as used here. Further research also needs to clarify what are the best practices when it comes to the institutional governance regulating services markets. Molinuevo and Sáez (2014) and the check-list in Annex 1 take one step in that direction, but future work would have to operationalize the different steps, in particularly for less developed countries.
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Figure 1: Average trade costs for services and manufactured goods, percent ad valorem equivalent, 2005-2015.

Source: Authors based on OECD-WTO TiVA data on gross exports and production, using the methodology in Miroudot et al. (2013); export values of zero are set equal to one dollar to enable calculation of trade costs across all country pairs.
Figure 2: Impact of regulatory heterogeneity on firm-level average costs

Source: Kox and Lejour (2005)
| Destination (import) country | Coherence / cooperation / harmonization |
|------------------------------|----------------------------------------|
|                              | No                                     | Yes                                     |
|                              | Regulatory heterogeneity - may         | Reduced regulatory heterogeneity -      |
|                              | have legitimate policy objective other | unilateral decision to adjust to        |
|                              | than restricting trade - barrier       | facilitate trade in services            |
|                              | to trade - fixed costs incurred        | - collaboration not necessarily needed  |
|                              | Reduced regulatory heterogeneity by    |                                           |
|                              | exchange of information - collaboration |                                           |
|                              | by regulators                          |                                           |
|                              |                                           | Regulatory "homogeneity" - may           |
|                              |                                           | have legitimate policy objective other   |
|                              |                                           | than restricting trade - no barrier      |
|                              |                                           | to trade - economies of scale           |

Source: Authors’
**Table 2: Variable definitions and sources.**

| Variable   | Definition                                                                 | Source       |
|------------|---------------------------------------------------------------------------|--------------|
| Colony     | Dummy variable equal to unity for country pairs that were once in a colonial relationship. | CEPII        |
| Common Colonizer | Dummy variable equal to unity for country pairs that were colonized by the same power. | CEPII        |
| Common Language | Dummy variable equal to unity for country pairs with a common language (ethnographic definition). | CEPII        |
| DB*Intl    | Doing Business indices on resolving insolvency, contract enforcement, and investor protection (simple average), interacted with International dummy. | World Bank   |
| DTRI*Intl  | Digital Trade Restrictiveness Index (cross border) interacted with International dummy. | ECIPE        |
| Exports    | Bilateral exports in value terms.                                          | OECD-WTO     |
| Intl       | Dummy variable equal to unity for international observations.             | Authors      |
| ln(Dist)   | Logarithm of bilateral distance.                                           | CEPII        |
| RegGov*Intl| Regulatory governance indicator interacted with International dummy.      | World Bank   |
| RegHet*Intl| Regulatory heterogeneity index based on answers to STRI regulatory questionnaire. | OECD         |
| RTA        | Dummy equal to unity for country pairs in the same regional trade agreement. | De Sousa (2012) |
| STRI*Intl  | Services Trade Restrictiveness Index interacted with the International dummy. | OECD         |
| WGI*Intl   | Simple average of the regulatory quality and government effectiveness indicators, interacted with the International dummy. | World Bank   |
**Table 3a: Summary statistics (aggregate data).**

| Variable              | Observations | Mean  | Std. Dev. | Min   | Max   |
|-----------------------|--------------|-------|-----------|-------|-------|
| Colony                | 3,969        | 0.026 | 0.160     | 0.000 | 1.000 |
| Common Colonizer      | 3,969        | 0.019 | 0.137     | 0.000 | 1.000 |
| Common Language       | 3,969        | 0.084 | 0.278     | 0.000 | 1.000 |
| DB*Intl               | 3,969        | 62.309| 12.619    | 0.000 | 79.910|
| DTRI*Intl             | 3,717        | 0.161 | 0.104     | 0.000 | 0.500 |
| Exports               | 3,969        | 0.013 | 0.268     | 0.000 | 14.550|
| Intl                  | 3,969        | 0.984 | 0.125     | 0.000 | 1.000 |
| ln(Distance)          | 3,969        | 1.519 | 1.115     | -5.008| 2.986 |
| RegGov*Intl           | 3,969        | 3.937 | 1.185     | 0.000 | 5.000 |
| RegHet*Intl           | 2,043        | 0.000 | 3.351     | -8.256| 8.972 |
| RTA                   | 3,969        | 0.478 | 0.500     | 0.000 | 1.000 |
| STRI*Intl             | 2,772        | 0.224 | 0.116     | 0.000 | 0.478 |
| WGI*Intl              | 3,969        | 0.875 | 0.747     | -0.612| 2.249 |
Table 3b: Correlation matrix (aggregate data).

|                  | Colony | Common Colonizer | Common Language | DB *Intl | DTRI *Intl | Exports | Intl | ln(Distance) | RegGov *Intl | RegHet *Intl | RTA | STRI *Intl | WGI *Intl |
|------------------|--------|------------------|-----------------|---------|-----------|---------|------|--------------|--------------|--------------|-----|-----------|-----------|
| Colony           | 1.00   |                  |                 |         |           |         |      |              |              |              |     |           |           |
| Common Colonizer | -0.01  | 1.00             |                 |         |           |         |      |              |              |              |     |           |           |
| Common Language  | 0.28   | 0.03             | 1.00            |         |           |         |      |              |              |              |     |           |           |
| DB *Intl         | 0.05   | -0.02            | 0.08            | 1.00    |           |         |      |              |              |              |     |           |           |
| DTRI *Intl       | 0.02   | -0.01            | -0.01           | 0.22    | 1.00      |         |      |              |              |              |     |           |           |
| Exports          | -0.01  | 0.00             | -0.01           | -0.30   | -0.09     | 1.00    |      |              |              |              |     |           |           |
| Intl             | 0.03   | 0.01             | 0.04            | 0.77    | 0.23      | -0.39   | 1.00 |              |              |              |     |           |           |
| ln(Distance)     | -0.07  | -0.08            | 0.04            | 0.25    | 0.04      | -0.10   | 0.37 | 1.00         |              |              |     |           |           |
| RegGov *Intl     | 0.06   | -0.03            | 0.05            | 0.64    | -0.07     | -0.25   | 0.65 | 0.15         | 1.00         |              |     |           |           |
| RegHet *Intl     | -0.04  | -0.06            | -0.03           | -0.08   | 0.16      | 0.00    | 0.00 | 0.53         | -0.12        | 1.00         |     |           |           |
| RTA              | -0.03  | 0.02             | -0.03           | -0.05   | -0.17     | 0.02    | -0.08| -0.56        | 0.03         | -0.50        | 1.00|           |           |
| STRI *Intl       | -0.01  | -0.01            | 0.08            | 0.06    | 0.34      | -0.11   | 0.27 | 0.56         | 0.01         | 0.65         | -0.44| 1.00      |           |
| WGI *Intl        | 0.03   | -0.01            | 0.06            | 0.56    | -0.20     | -0.09   | 0.23 | -0.08        | 0.43         | -0.34        | 0.19| -0.42     | 1.00      |
Table 4: Aggregate gravity model regression results.

|          | (1)       | (2)       | (3)       | (4)       | (5)       | (6)       | (7)       |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|          | $X_{ij}$  | $X_{ij}$  | $X_{ij}$  | $X_{ij}$  | $X_{ij}$  | $X_{ij}$  | $X_{ij}$  |
| RTA      | 0.315 *** | 0.041     | 0.007     | 0.038     | 0.062     | 0.075     | 0.042     |
|          | (0.087)   | (0.093)   | (0.113)   | (0.109)   | (0.117)   | (0.111)   | (0.121)   |
| ln(Distance) | -0.450 *** | -0.516 *** | -0.513 *** | -0.565 *** | -0.558 *** | -0.553 *** | -0.605 *** |
|          | (0.036)   | (0.037)   | (0.038)   | (0.042)   | (0.042)   | (0.043)   | (0.048)   |
| Colony   | 0.360 **  | 0.224     | 0.181     | 0.184     | 0.182     | 0.158     | 0.189     |
|          | (0.145)   | (0.151)   | (0.165)   | (0.161)   | (0.162)   | (0.164)   | (0.164)   |
| Common Colonizer | 0.764 *** | 0.415 *** | 0.498 **  | 0.446 *   | 0.484 **  | 0.575 **  | 0.495 **  |
|          | (0.215)   | (0.136)   | (0.254)   | (0.233)   | (0.234)   | (0.231)   | (0.249)   |
| Common Language | 0.590 *** | 0.562 *** | 0.573 *** | 0.470 *** | 0.457 *** | 0.434 *** | 0.368 **  |
|          | (0.106)   | (0.124)   | (0.146)   | (0.137)   | (0.136)   | (0.140)   | (0.145)   |
| Intl     | -4.543 ***| -3.845 ***| -3.858 ***| -3.506 ***| -3.911 ***| -4.773 ***| -3.248 ***|
|          | (0.096)   | (0.085)   | (0.124)   | (0.180)   | (0.512)   | (0.730)   | (0.980)   |
| STRI*Intl | -2.762 ***| -2.771 ***| -2.096 ***| -2.047 ***| -1.902 ***| -1.208 *  | (0.377)   |
|          | (0.578)   | (0.578)   | (0.578)   | (0.587)   | (0.645)   | (0.657)   | (0.657)   |
| RegHet*Intl | -0.001    | -0.001    | 0.001     | 0.002     | 0.030     |           |           |
|          | (0.021)   | (0.020)   | (0.020)   | (0.020)   | (0.021)   | (0.021)   | (0.021)   |
| DTRI*Intl | -1.871 ***| -1.664 ***| -1.712 ***| -1.647 ***|           |           |           |
|          | (0.612)   | (0.516)   | (0.503)   | (0.551)   | (0.516)   | (0.503)   | (0.551)   |
| RegGov*Intl | 0.079     | 0.025     | -0.056    |           |           |           |           |
|          | (0.109)   | (0.122)   | (0.128)   | (0.128)   | (0.122)   | (0.128)   | (0.128)   |
| DB*Intl  | 0.016     | -0.013    |           |           |           |           |           |
|          | (0.012)   | (0.016)   | (0.016)   | (0.016)   | (0.016)   | (0.016)   | (0.016)   |
| WGI*Intl |           |           |           | 0.687 *** |           |           |           |
|          |           |           |           | (0.163)   |           |           |           |

Note: Dependent variable is Exports in all cases. Estimation is by PPML with fixed effects by importer and exporter. Robust standard errors corrected for clustering by country pairs are reported in parentheses. Statistical significance is indicated as follows: * (10%), ** (5%), and *** (1%).
Table 5: Percentage ad valorem equivalents, based on Table 4 column 7, in descending order of the tariff equivalent of poor trade facilitation.

| Country               | STRI | DTRI | WGI | Total TFiS = DTRI + WGI |
|-----------------------|------|------|-----|-------------------------|
| Russian Federation    | 17.6 | 31.6 | 92.5| 124.1                   |
| China                 | 17.9 | 31.6 | 74.8| 106.4                   |
| Indonesia             | 19.8 | 18.7 | 86.8| 105.5                   |
| India                 | 21.2 | 14.7 | 83.4| 98.1                    |
| Turkey                | 13.9 | 22.9 | 67.5| 90.3                    |
| Brazil                | 13.7 | 0.0  | 85.0| 85.0                    |
| Colombia              | 11.3 | 7.1  | 68.7| 75.8                    |
| Greece                | 7.8  | 10.9 | 64.2| 75.1                    |
| South Africa          | 10.7 | 7.1  | 66.6| 73.7                    |
| Mexico                | 15.0 | 7.1  | 66.1| 73.2                    |
| Italy                 | 7.6  | 10.8 | 54.9| 65.7                    |
| Hungary               | 7.3  | 7.1  | 53.4| 60.5                    |
| Costa Rica            | 12.0 | 0.0  | 59.8| 59.8                    |
| Poland                | 7.9  | 14.7 | 44.2| 59.0                    |
| Slovenia              | 6.8  | 7.1  | 47.6| 54.7                    |
| Slovak Republic       | 7.2  | 7.1  | 47.1| 54.2                    |
| Republic of Korea     | 11.8 | 14.7 | 38.9| 53.7                    |
| Spain                 | 6.9  | 7.1  | 41.3| 48.4                    |
| Czech Republic        | 6.2  | 7.1  | 38.6| 45.7                    |
| Portugal              | 6.4  | 7.1  | 38.1| 45.2                    |
| Latvia                | 4.1  | 7.1  | 38.1| 45.2                    |
| Canada                | 9.4  | 22.9 | 19.0| 41.9                    |
| Lithuania             | 5.6  | 7.1  | 33.7| 40.8                    |
| Belgium               | 8.5  | 10.9 | 29.7| 40.6                    |
| France                | 6.8  | 7.1  | 32.1| 39.2                    |
| Israel                | 14.5 | 7.1  | 30.7| 37.8                    |
| Estonia               | 6.5  | 7.1  | 29.6| 36.7                    |
| Iceland               | 17.8 | 7.1  | 29.1| 36.2                    |
| Austria               | 8.2  | 7.1  | 27.4| 34.5                    |
| Chile                 | 8.3  | 0.0  | 34.2| 34.2                    |
| Germany               | 5.6  | 14.7 | 19.3| 34.0                    |
| United States         | 9.8  | 3.5  | 29.8| 33.3                    |
| Denmark               | 4.9  | 14.7 | 17.6| 32.3                    |
| Australia             | 7.8  | 10.9 | 20.7| 31.6                    |
| United Kingdom        | 5.8  | 10.9 | 17.5| 28.4                    |
| Ireland               | 5.3  | 7.1  | 20.8| 27.9                    |
| Country       | Column 1 | Column 2 | Column 3 | Column 4 |
|--------------|----------|----------|----------|----------|
| Sweden       | 6.8      | 10.9     | 17.0     | 27.8     |
| Netherlands  | 5.1      | 10.9     | 16.9     | 27.8     |
| Finland      | 7.2      | 10.9     | 16.7     | 27.6     |
| Luxembourg   | 7.2      | 7.1      | 20.3     | 27.4     |
| Norway       | 12.3     | 7.1      | 19.1     | 26.2     |
| Japan        | 8.7      | 0.0      | 25.7     | 25.7     |
| Switzerland  | 13.3     | 7.1      | 15.5     | 22.6     |
| New Zealand  | 8.0      | 7.1      | 14.6     | 21.8     |

Note: Total TFIS column shows ad valorem equivalent trade costs linked to TFIS variables. The STRI column is presented for comparison only.
Figure 3: Percentage ad Valorem Equivalents, sorted by size
|                      | Finance      | Computer     | Transport    | Telecom      |
|----------------------|--------------|--------------|--------------|--------------|
|                      | $X_{ij}$     | $X_{ij}$     | $X_{ij}$     | $X_{ij}$     |
| RTA                  | -0.654 ***   | -0.053       | 0.419 ***    | 0.100        |
|                      | (0.242)      | (0.182)      | (0.092)      | (0.095)      |
| Ln(Distance)         | -0.529 ***   | -0.585 ***   | -0.538 ***   | -0.575 ***   |
|                      | (0.084)      | (0.051)      | (0.052)      | (0.075)      |
| Colony               | 0.176        | -0.233       | 0.337 **     | 0.355 **     |
|                      | (0.336)      | (0.266)      | (0.170)      | (0.172)      |
| Common Colonizer     | 0.807 *      | 1.031 ***    | 0.950 ***    | 0.310        |
|                      | (0.461)      | (0.367)      | (0.236)      | (0.326)      |
| Common Language      | 0.716 ***    | 0.533 *      | 0.142        | 0.406 ***    |
|                      | (0.261)      | (0.291)      | (0.163)      | (0.135)      |
| Intl                 | 0.334        | 0.393        | -9.198 ***   | -2.881 ***   |
|                      | (2.194)      | (1.062)      | (0.891)      | (1.093)      |
| STRI*Intl            | -6.545 ***   | -1.213       | -0.315       | -6.788 ***   |
|                      | (1.623)      | (1.149)      | (0.697)      | (0.844)      |
| RegHet*Intl          | 3.260 **     | 1.242        | 1.391 *      |              |
|                      | (1.596)      | (1.179)      | (0.758)      |              |
| DTRI*Intl            | -7.518 ***   | -3.245 ***   | -2.067 ***   | 1.506 **     |
|                      | (1.461)      | (1.119)      | (0.588)      | (0.685)      |
| RegGov*Intl          | 0.669 **     | 0.434 ***    | -0.357 **    | 0.397 ***    |
|                      | (0.278)      | (0.151)      | (0.145)      | (0.134)      |
| DB*Intl              | -0.152 ***   | -0.110 ***   | 0.104 ***    | -0.053 ***   |
|                      | (0.024)      | (0.014)      | (0.019)      | (0.015)      |
| WGI*Intl             | 2.761 ***    | 1.352 ***    | -0.157       | 0.473 **     |
|                      | (0.308)      | (0.166)      | (0.200)      | (0.191)      |
| Observations         | 1980         | 1980         | 1482         | 2772         |
| R2                   | 0.016        | 0.035        | 0.090        | 0.035        |

Note: Dependent variable is Exports in all cases. Estimation is by PPML with fixed effects by importer and by exporter. Robust standard errors corrected for clustering by country pairs are reported in parentheses. Statistical significance is indicated as follows: * (10%), ** (5%), and *** (1%).
**Figure 4**: Relative Importance of AVEs and Economic Performance Indicators

Source: Authors’ calculations; WDI; OECD; ECIPE.
Annex

Annex 1: 8 Principle of Good Regulation

As described in the text, Molineovo and Sáez (2014) describe the 8 general principles that should guide the regulatory process by regulators. They are based on he works by the Council of Australian Governments and were endorsed by the government in 1998 (see Coghlan, 2003). They are:

1. Regulation must yield a net benefit to the community, not just to a particular group or sector.
2. Regulation must be set to the minimum level necessary to achieve the objectives and to avoid unnecessary restrictions. It should be targeted at the problem.
3. Regulation should be integrated and consistent with other laws, agreements, and international obligations. Any restrictions on competition should be retained only if they provide a net benefit to the community and government objectives cannot be achieved by other means.
4. Regulation should not be unduly prescriptive; preferably, it should be specified in relation to performance or outcomes. It should be flexible enough to allow businesses some freedom to find the best way to comply and to allow the regulation to adapt to changed circumstances.
5. Regulation should be accessible, transparent, and accountable. The public should be able to readily find out what regulations they must comply with, and the regulations must be reasonably easy to understand and fairly and consistently administered and enforced.
6. Regulation must be clear, concise, and communicated effectively.
7. Regulation should be mindful of the compliance burden imposed, proportionate to the problem being addressed, and set at a level that lessens compliance costs while still achieving the set objective.
8. Regulation must be enforceable and embody the minimum incentives needed for reasonable compliance. Adequate resources must be provided for monitoring and to ensure reasonable compliance.