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# Services trade and domestic regulation

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## Working Party of the Trade Committee

# SERVICES TRADE AND DOMESTIC REGULATION

**OECD Trade Policy Working Paper No. 49**

**by Henk Kox (CPB Netherlands Bureau for Economic Policy Analysis, The Hague)**
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**Abstract**

This paper argues that regulatory measures affect the fixed cost of entering a market as well as the variable costs of servicing that market. Moreover, differences in regulation among countries often imply that firms have to incur entry costs in every new market. Indicators of regulatory intensity and heterogeneity are introduced in a gravity model and their impact on market entry and subsequent trade flows estimated for total services, business services and financial services. It is found that regulatory heterogeneity has a relatively large negative impact on both market entry and subsequent trade flows. Further, regulatory barriers have a negative effect on the local services sectors' export performance. Finally it is found that regulations that aims at correcting market failure can have a positive impact on trade. It is concluded that services trade liberalization and regulatory reforms are complementary in creating competitive services markets.

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The study is available on the OECD website in English and French: http://www.oecd.org/tad

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# SERVICES TRADE AND DOMESTIC REGULATION

## EXECUTIVE SUMMARY

The regulatory measures mentioned in GATS Article VI.4, qualification requirements, qualification procedures, licensing requirements, licensing procedures and technical standards are mainly related to upfront costs of entering a market. This paper first explains that entry barriers limit the number of firms that can break even in a particular market. The higher the entry barrier relative to the size of the market, the smaller the number of firms that can break even after having incurred the entry cost. In the face of such entry costs, trade liberalisation, defined as a reduction in variable trade costs, would lead to more trade, but also to global market concentration as the average firm size becomes larger. Competition need not be affected, however, since the total number of firms in each country, local plus foreign, will in most cases increase. Nevertheless, trade liberalisation in the face of significant entry barriers would allow only the most productive small and medium size enterprises' (SMEs) to enter foreign markets. If this is an unwanted side-effect of liberalisation, it can be mitigated by regulatory reforms aiming at reducing entry barriers.

Regulation of services sectors aims at correcting market failures such as asymmetric information, moral hazard, and market power due to economies of scale, to mention the most important. When such regulation successfully remedies market failure, it can lower entry barriers and improve welfare. Furthermore, when regulation is harmonised between trading partners, or mutual recognition agreed, it facilitates the integration of services markets. However, not all regulatory measures successfully correct market failures and complying with regulation is not costless. The empirical part of this study has made an attempt to measure what the costs and benefits of regulations are in the context of international trade in services.

In so doing it has used indicators that reflect the restrictiveness of regulation in areas relevant to GATS Article VI.4 and assessed their impact on foreign market entry for services at an aggregate level as well as for other business services and financial services. The former include the professional services for which qualification requirements are most widely applied while in financial services standards are central features of the regulatory regime. It is found that aggregate measures of product market regulation as measured by the OECD regulatory indices and the CPB heterogeneity indices are negatively related to both market entry and subsequent trade values. The effect is larger for other business services than for services on average. It is, however more difficult to establish robust relationships between the more detailed indicators of regulatory measures and trade.

For financial services a set of regulatory indices developed by the World Bank was used. A very interesting finding is that regulation aiming at ensuring appropriate standards appear to *reduce* both fixed and variable costs of servicing foreign markets in financial services for cross-border trade and FDI. Regulation that seeks to restrict the types of services banks can engage in, in contrast, is negatively related

to financial services sector trade. Both for other business services and financial services we find that home market regulation is strongly related to domestic firms' export performance.

From these findings the following policy lessons can be drawn:

- Well-designed domestic regulation in services characterised by imperfect competition, can reduce trade cost. Such regulation would be more beneficial when it is subject to international harmonisation or international standards.

- Well-regulated domestic markets can enhance the competitiveness of local service suppliers in foreign markets.

- In contrast, excessive domestic regulation not only restricts foreign suppliers from entering the market, it can be even more effective in restricting domestic suppliers from entering foreign markets.

- Regulatory barriers tend to deter SMEs from engaging in international trade more than it affects large multinational companies.

- Small countries are more affected by own and trading partner regulation than larger countries. Harmonising regulation with large trading partners could reduce trade costs for domestic firms in small countries, provided that such harmonisation would not imply costly reforms that offset the gains.

- Declining variable costs to trade in services due to trade liberalisation and improvements in communication technology stimulate trade in services and increase the average size of firms. Regulatory reforms in contrast contribute to reducing the average size of trading services firms.

- Disciplines on domestic regulation under the GATS could reduce entry barriers even if they addressed transparency and simplification of regulatory procedures only, but the benefits might be more widespread if disciplines also included regulatory principles as well as considering the adoption of international standards where applicable.

# I. INTRODUCTION

1. Article VI.4 of the GATS states that "With the view to ensuring that measures relating to qualification requirements and procedures, technical standards and licensing requirements do not constitute unnecessary barriers to trade in services, the Council for Trade in Services shall, through appropriate bodies it may establish, develop any necessary disciplines." Article VI is found in section II of the GATS. Section II deals with general obligations and disciplines and applies to all sectors, whether or not specific commitments are made. Nevertheless, the first sentence of Article VI states that "In sectors where specific commitments are undertaken, each Member shall ensure that all measures of general application affecting trade in services are administered in a reasonable, objective and impartial manner." Four paragraphs in Article VI are specifically stated to apply only to sectors where commitments are made, while this is not the case for Article VI.4. The WTO Secretariat suggests that the absence of such a limitation in Article VI.4 was intentional (WTO, 1999), while this view is not necessarily shared by Members. Thus, in the minutes from meeting in the Working Party on Domestic Regulation it appears to be an understanding that disciplines on domestic regulation would only apply to committed sectors (WTO, 2006).

2. Since services are intangible and often require that the service provider and the consumer interact directly, services are more affected by regulation than is merchandise trade. This is because services trade in many cases not only involves the movement of the service, but also its provider. Furthermore many professional services are so-called experience goods where the quality of the service cannot easily be observed by the consumer before after the service is consumed. And even then it can take considerable time before substandard quality is revealed. Medical and dental services, architectural and engineering services and accounting are cases in point. For instance, health problems due to negligence or malpractice in health and dental services may occur long after the service has been consumed, weaknesses in buildings and other construction work due to flaws in design can become apparent long after the building has been built and so on. Due to these market imperfections stemming from asymmetric information, regulation is certainly justified. This study therefore does not argue that regulation should be eliminated. Rather it aims at documenting how regulation – often unintentionally - restricts international trade in services and how legitimate regulations can be made less trade restrictive.

3. The study argues that compliance with the regulatory measures mentioned in Article VI.4 of the GATS involves an up-front cost prior to entering a foreign market, but it does not necessarily affect the cost of servicing the market once entry is made. Compliance with qualification requirements, for instance, could imply taking an exam that documents that the services supplier has the required qualification. Course work may also be required prior to the exam. Licence requirements are of a similar nature. A license needs to be acquired and a license fee paid before trade can commence, but the license fee is often unrelated to subsequent export values.

4. The impact on trade of regulatory measures that constitute a barrier to entry calls for a different approach to trade policy analysis than the traditional study of tariffs and tariff equivalent trade costs.[1] While tariffs increase the market price of imports and/or lower the unit price that the exporter receives, a fixed trade cost need not affect the price of the good or the service much. But a fixed cost has an impact on

[1] A common way of modelling trade costs is the so-called iceberg costs where a certain percentage of the value of the traded good "melts away" during transit (Samuelson, 1952).

the export value necessary for the exporting firm to break even. The higher the volume, the lower is the cost per unit. Therefore, fixed trade costs affect the average size of exporting firms and by implication the number of firms that the market can accommodate. The higher the entry barrier, the larger the export volume needs to be. This means, perhaps paradoxically, that the higher the entry barriers to foreign services suppliers, the larger the market share the foreign suppliers need to capture, assuming that the entry barrier is not prohibitive.

5. Fixed trade costs or entry barriers have attracted little attention in the literature. This study suggests a methodology for analysing fixed costs in services trade and provides a first attempt to estimate the impact of such costs for the OECD area. Only one study has been published so far on this topic and it studies intra-EU services trade only (Kox and Lejour, 2005). The current study therefore contributes to new insight into an area that is under-researched but highly relevant as domestic regulation is on the negotiation table in the now suspended Doha round in the WTO. The study could also provide useful insights during the implementation of the Services Directive in the European Union and inform the debate related to regulatory issues in regional trade agreements.

6. In the following we will define "trade liberalisation" as trade policies that reduce variable trade costs or remove trade barriers that have a similar effect as quotas in merchandise trade. A quota can in principle be zero; i.e. imports can be banned, and can be converted to tariff-equivalent trade costs.[2] "Regulatory reforms" are defined as policies that reduce the fixed cost of entering a foreign market. These can be related to qualification requirements, licences or standards. They may well be the same for local and foreign services providers, but could still be more burdensome for foreign providers. It would for instance be more burdensome for foreign services providers if a qualification requirement was in the form of a diploma or certificate from a local education institution rather than specifying the skills required. A regulatory principle from technical standards for goods is that standards should be functional rather than specific, a principle that could be applied to services as well. [3]

7. The study is organised as follows: Section 2 explains the concept of fixed trade costs and how it affects trade flows and market structure. Section 3 contains two sub-sections. The first presents data on trade in services, while the second presents and discusses the regulatory indices used in the empirical analysis. Section 4 presents empirical results where the indicators presented in Section 3 are used to estimate the relation between domestic regulation on the one hand and international trade flows as well as market entry on the other hand. It should be noted upfront that the regulatory measures applied in the empirical analysis do not fully match the regulatory measures covered by Article VI.4 in the GATS. Further, the classification of services in the OECD database follows the Fifth Edition of the IMF Balance of Payment Manual, and does not fully correspond to the W120, which is the most commonly used classification in the GATS schedules. Finally, the services trade database defines trade as services transactions between residents and non-residents and covers GATS modes 1, 2 and 4, but not mode 3. Section 5 presents empirical results for the financial sector where we have used a different set of regulatory indicators developed specifically for financial services by the World Bank. Section 6 summarises, discusses policy implications and indicates direction for further research.

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2 Quotas can easily be converted to tariff equivalents in the event of competitive markets, but this is not the case when suppliers have significant market power.

3 It is for instance better to specify standards e.g. for valves used in the petroleum industry in terms of ability to function under prescribed temperature and pressure conditions rather than specifying dimensions and alloys.

## 2. REGULATORY BARRIERS TO TRADE IN SERVICES: CONCEPTS AND EVIDENCE

### Concepts

8. The production and consumption of services often cannot be separated in space and time, making it difficult to standardise a service product. The quality of the product in many cases is a priori uncertain for the consumer. For a simple service product such as a haircut, this uncertainty problem is generally manageable. The information problem for the individual service buyer is, however, more serious in the case of more complex professional and medical services that require the input of specialist knowledge. To repair such structural asymmetries governments may find it appropriate to regulate services where information asymmetry is relevant. Domestic regulation of services markets may also be motivated by externalities like public safety, health, or the integrity of the financial system. Though such regulations often are not necessarily meant to protect the domestic market, they often cause fixed cost for foreign services firms that enter the market. Box 1 gives a number of examples.

**Box 1. Examples of national regulations for services providers that affect fixed costs**

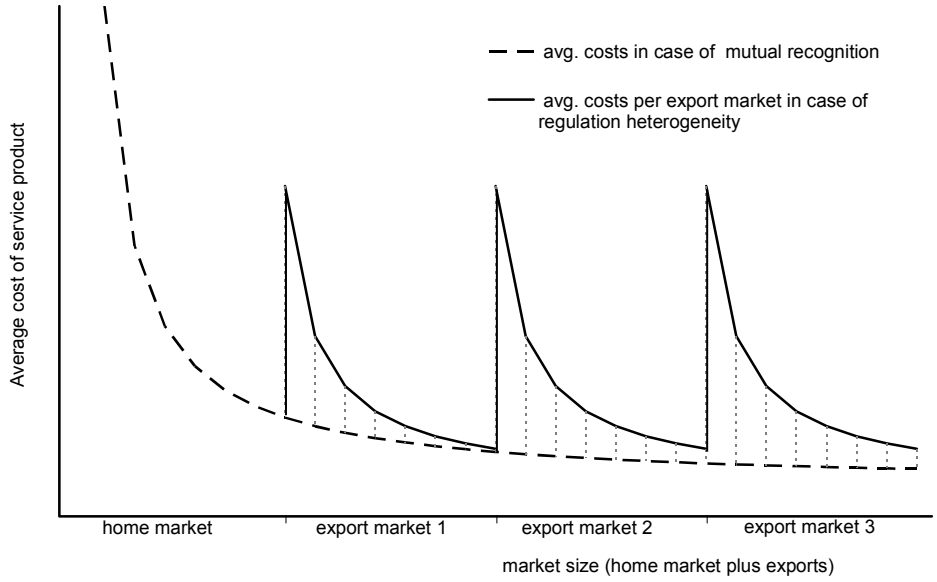
- Firm start-up licenses and associated authorisation requirements.
- Service-providing personnel must have locally recognised professional qualifications (may necessitate re-qualification).
- Obligatory membership of local professional association.
- Owners or managers of service-providing firm must have local residence or nationality.
- Requirement that firms have a specific legal form.
- Requirement that service providers have nationally recognised liability insurance or professional indemnity insurance.
- All service activities in export destination country fully subject to regular administrative and tax procedures.
- Limitations on inter-professional co-operation or on the variety of services provided by one firm (may require unbundling).
- Temporary service personnel from origin country subject to rules of the social security system of the destination country.
- Impediments for material inputs, suppliers and personnel from origin country (necessitates search for new local suppliers).

9. The fact that a national service market *is* regulated is not in itself an important barrier to international services trade. This can be shown by a little thought experiment. Suppose that all countries have the same type of regulation, for instance, a qualification requirement for providers producing a particular service product. Since qualification costs are mainly fixed costs, it would cost an exporting firm

a one-off effort to comply with the qualification criteria. Once having incurred these costs in its home country, the firm could reap economies of scale by expanding into export markets.

10. However, such a harmonised system of regulation for service markets hardly exists. Countries often have little confidence in the quality of each other's legal regimes and are reluctant to adapt their own regimes where necessary to facilitate cross-border activities. The result is that each national authority uses its own system of quality safeguards to protect services buyers. Due to the fact that these fixed qualification requirements are specific for each national market, the costs cannot be spread out over production that is destined for other OECD markets. This makes it difficult to exploit economies of scale. Figure 1 pictures these effects for a service provider who enters a number of export markets. The presence of national qualification requirements gives rise to country-specific fixed costs for the service exporter. Implicitly, the shaded area in Figure 1 shows – from the perspective of the exporting firm – the cost savings of a system that allows firms to achieve more economies of scale in dealing with regulation requirements. Qualification requirements and associated costs for legal and other market entry assistance are mostly independent of firm size. Hence, the market-entry deterring effect will be strongest for small and medium-sized enterprises (SME). They form the large majority of service providers (in terms of numbers).

**Figure 1. Cost effect of regulatory heterogeneity**




11. It has been well documented that only a fraction of existing firms in a particular industry exports, those that do tend to be more productive and larger than the industry average, while each exporting firm typically exports to a limited number of countries (Bernard and Jensen, 1997, 1999; Bernard et al. 2003). If there were no extra costs of entering foreign markets, there is no reason why firms should not sell their output in all markets where customers could be found, and the observed trade patterns consequently strongly suggests the existence of entry barriers and fixed trade costs.

12. In a survey held among a large number of business service firms in the EU, 44% of the firms mentioned costs as a "very important" barrier to setting up a local operation in other countries (CSES, 2001). Those firms that were able to estimate the size of the setup costs estimated the latter to be of the order of 6 months sales proceeds. As a conclusion of an EU-wide survey on intra-EU trade barriers the

European Commission (2002) states: "*Evidence collected from SMEs and SME-supporting organisations suggests that many SMEs back off after initial inquiries about administrative requirements and procedures because they feel they do not have the necessary resources to deal with the current complexity. Such agencies report that micro enterprises in particular were easily dissuaded from engaging in cross-border activities"*. Not only service providers are hampered by the heterogeneity in regulatory regimes. Regulation heterogeneity suppresses foreign competition and the influx of foreign services providers with new products and innovative working methods. It implicitly restricts the choice possibilities for domestic firms that want to purchase business services.

13. Even though firm heterogeneity is a feature of the business environment that most observers are aware of, trade policy analysis has until recently abstracted from this fact. It is thought that simplifying the analysis by using the notion of a representative firm has facilitated tractable analyses that by and large produce reasonable results and insights. However, as variable trade costs have declined due to trade liberalisation and improved transport and communication technology, fixed trade costs and their impact on trade flows and market structure have caught more attention. An early contribution to the literature was Venables (1994) who showed that trade liberalisation in the presence of fixed trade costs would lead to market concentration in the liberalising sector. New firms would enter the export market, existing exporters would increase their export volumes while some firms would close down and the average firm size would increase as a result. Nevertheless, even if the global number of firms in the liberalising industry declines, the number of firms servicing a particular country (local + foreign firms) need not decline. Moreover, in small countries competition is usually enhanced because the number of foreign entrants exceeds the number of local firms that exits the market. Subsequent research has shown that unless the fixed costs are very large relative to the market size, small countries will experience the largest increase in the number of suppliers (Nordås, 2003).

**Box 2. Fixed and sunk costs**

Fixed costs are independent of production volume. Examples are R&D expenditure and the costs related to obtaining a business license. These costs are incurred whether or not the product or the business is successful. If this type of cost cannot be recovered in the market, it is also a sunk cost. If for example qualification requirements are country-specific and related certificates not transferable to other countries, the cost of acquiring it will be sunk. Other types of fixed costs – often labelled quasi-fixed costs – are independent of sales and production volumes within a certain range of production, or for a give period. Examples of such fixed costs are office rents and rental costs of capital. These costs recur and are independent of production up to a capacity ceiling. The difference between sunk fixed costs and quasi-fixed costs is that the former constitute an entry barrier, but should not affect the pricing decision of firms post entry, while quasi-fixed costs do affect firms' pricing decisions and in addition can constitute an entry barrier.

14. The latest contributions to the literature have aimed at describing and explaining the dynamic interaction between fixed, sunk and variable trade costs and market structure, following a seminal paper by Melitz (2003), who introduced heterogeneous firms and fixed and variable costs in trade models. An important insight from this work is that firms will self-select into export markets and the most productive firms within the sector will become exporters. As variable trade costs come down, existing exporters will expand their export sales, the most productive among the firms servicing the local market only will become exporters and expand their total output, while the least productive firms servicing the domestic economy only will close down. This reallocation of resources between firms *within* the liberalising sector will increase the average productivity in the sector. It will also lower the average productivity of exporting firms, since firms that are lower on the productivity ranking in their home country are able to enter foreign markets.

15. The models based on firm heterogeneity can also be used for analysing the impact of regulatory reform on trade. Lowering entry costs, for instance through harmonisation of technical standards, would encourage new firms to enter export markets. The theory predicts that this would be the only channel

through which reforms would affect trade since existing exporters have presumably already recovered their entry costs. Regulatory reform could therefore moderate the market concentration effect of trade liberalisation. Negotiations under the GATS on specific commitments and on disciplines on domestic regulation complement each other and could result in more trade without an undesirable market concentration effect.

16. Regulatory barriers are not the only source of fixed trade costs in services. There are also natural barriers for instance related to differences in language, culture and institutions. Obviously, information needs to be translated to the local language and cultural context of the importing country. Since services are generally more information-intensive than goods, one would expect that language constitutes a higher barrier to trade in services than to trade in goods. Institutional features can also be important. An obvious example is legal services where the legal framework and the institutional framework in which it is embedded differ between countries. Such barriers are a given and they are not (nor should they be) subject to trade negotiations. Nevertheless, when evaluating the impact of trade liberalisation and regulatory reform, geographical, cultural and institutional factors must be taken into account. In particular it should be acknowledged that one cannot assume that markets will be fully integrated in the presence of natural barriers to trade.

**Evidence**

17. The only existing empirical analysis that studies the impact of domestic regulation on services trade treating regulatory barriers as fixed costs (to our knowledge) is a study by Kox and Lejour (2004; 2005) which analyses intra-EU trade in commercial services. As a proxy for regulation-based fixed market entry costs, the study develops an index of bilateral regulatory heterogeneity. Regulatory *differences* are seen as an entry barrier for the reasons explained in the thought experiment above. The indices for regulatory *heterogeneity* are found to have a strong negative and significant impact on bilateral trade flows. The study also controls for the relative intensity of regulation in origin and destination country. It finds that the impact of the regulatory level is asymmetric. A high level of regulation in the exporting country has a negative impact on bilateral services trade, while the regulation level in the importing country has no significant impact on bilateral services trade. The study applies these results for assessing the potential trade impacts of the proposed EU Services Directive.

18. Copenhagen Economics (2005) study the impact of government regulation on intra-EU trade. They develop indicators based on surveys where questions are designed on the basis of the OECD regulation indices. The impact of the proposed EU Services Directive on the indicators is next estimated. The authors recognise that markets remain fragmented due to natural barriers to trade as well as due to remaining regulatory barriers. The study first estimates the rent-creating and cost-creating effects caused by the level of domestic regulation and subsequently uses these effects as tariff equivalents in their model simulations.

19. The treatment of all trade barriers as tariff equivalents is also the weakness of a number of empirical studies analysing the impact of Doha round liberalisation using general equilibrium modelling. These studies abstract from fixed services trade costs and also the fact that regulatory heterogeneity has a trade restricting effect (e.g. Dee and Hanslow, 2000; Dee, 2005). General equilibrium analyses typically estimate the tariff equivalent of trade barriers in services, calibrate the benchmark solution with these tariffs and then model trade liberalisation as the elimination of the tariffs – creating a single world market price for the liberalised service. As argued above, this is unrealistic in the presence of natural barriers to trade in services.

20. Among the indicators used in quantitative estimates of services trade liberalisation are a set of indicators developed by the OECD for OECD countries (Boylaud et al., 2000; Jean and Nicoletti, 2002;

Golub, 2003), indicators developed by the OECD for non-OECD countries (TD/TC/WP(2005)36), Dihel (2005) and work by the Australian Productivity Commission (APC). In addition the IMF and the World Bank produce indicators of financial sector regulation and the ITU of telecommunications regulation.[4] Unfortunately, although the indicators are intended to measure similar effects, they are not always consistent with each other. For instance Golub (2003) found that the correlation between his own indicators on regulation affecting foreign direct investment and corresponding indicators from the APC ranked between 0.1 for business services to 0.58 for telecommunications services.[5] Thus, measuring trade restrictiveness in services is fraught with difficulties and leaves considerable space for subjective judgement and interpretation. Results should therefore be seen as indicating the direction and order of magnitudes of relations between regulation and trade flows rather than precise estimates of causal relations.

21. While the analysis in the present study applies the best data available and explores standard methodologies as well as recent improvements in these, results should and will be interpreted with caution. The study builds on the Kox and Lejour framework and extends it in three dimensions. First, it has a wider country coverage including all OECD countries. Furthermore, the estimates of natural barriers to trade include 29 reporting and 68 partner countries, although there are gaps in the data that prevents a balanced panel analysis.[6] Second, the study is extended by analysing not only positive trade flows, but also what determines market entry.[7] Third, the study includes regulatory indices from Barth et al. (2006) to analyse the impact on regulatory measures on trade in financial services. These indicators are detailed, they measure regulation in the financial sector directly and they cover the regulatory measures most relevant to GATS Article VI.4 and the text on domestic regulation included in the Financial Services Annex to GATS.

22. To summarise this section, trade liberalisation in the face of fixed costs raises productivity in the exporting sector and increases market concentration globally. Nevertheless, the total number of suppliers (domestic + foreign) *in each country* is likely to increase unless either entry barriers are high or the country is very large. The global market concentration effect of trade liberalisation can be mitigated by regulatory reform such as harmonisation of domestic regulation or mutual recognition. Furthermore, harmonisation in its own right would increase the diversity of services suppliers. Numerous studies have shown that consumer welfare increases with product variety, and that productivity in downstream firms improves with access to a broader range of intermediate inputs, including services. Regulatory reforms could therefore improve welfare and productivity.

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4 The financial sector regulatory measures are compiled and published by Barth et al. (2006).

5 A correlation coefficient close to one would indicate that the measures are consistent with each other and measure the same thing. Differences in scores are due to differences in methodology and do not imply that one is superior to the other. It simply means that there is no exact measure of regulatory restrictions that are applicable to all countries and all sectors.

6 A balanced panel contains observations on all variables in all years included in the panel.

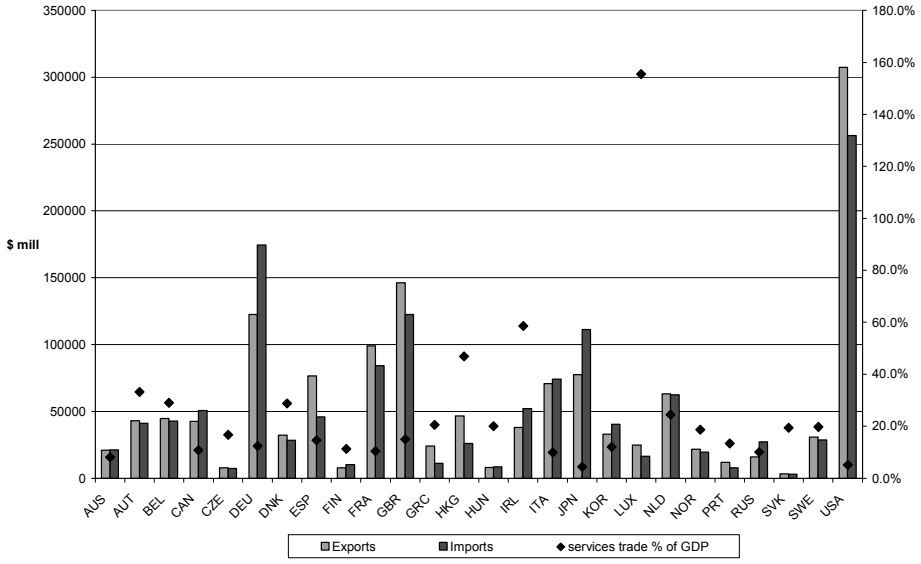
7 This was not a relevant issue studying intra-EU trade only, since there are very few empty cells in the intra-EU trade matrix.

## 3. TRADE IN SERVICES AND REGULATORY MEASURES

### Trade in services

23. The analysis is based on the OECD database on bilateral services trade flows. It includes 29 reporting countries (the OECD members except Iceland, Poland and Switzerland) plus Hong Kong and Russia. However, of these 29 reporters, Mexico, New Zealand and Turkey do not report bilateral trade figures. Most countries and regions in the world are included as partners, but of these only 68 had comprehensive coverage by sector and reporting country.[8] Total services exports, imports and services trade share of GDP are reported in Figure 2. The data includes trade flows as defined in the IMF balance of payment manual (BPM5).

**Figure 2. Services trade, 2003**




*Source*: OECD

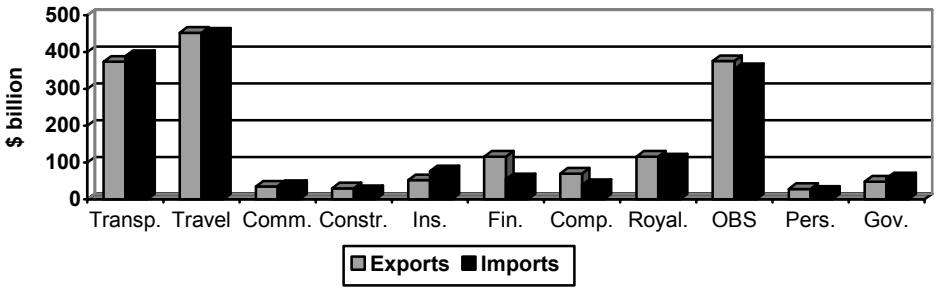
24. The largest net exporters in absolute terms are the U.S. and the U.K., while Germany and Japan are the largest net importers. The countries to which services trade was most important relative to GDP in 2003 are Luxembourg (155%), Ireland (59%) and Hong Kong (47%). As for merchandise trade, small countries tend to have higher trade shares to GDP than large countries. Luxembourg is the outlier and its economy is highly specialised in services, especially international banking.[9] Turning to the relative

8 Exports to some of the countries are reported by only one OECD member. For instance Canada is the only country reporting services exports to a number of small Latin American countries while Australia is the only country reporting exports to small Pacific countries such as Fiji. This probably further illustrates the relevance of distance in services trade, but since the other reporters have no information on trade with these countries, no firm conclusions can be drawn.

9 Trade to GDP ratios larger than 100% are not uncommon in small open economies. The reason is that while GDP only includes value added, trade values reflect the gross output crossing borders (i.e. including intermediate inputs). Furthermore, small countries export a large share of what is being produced and import a large share of what is being consumed.

importance of the services sectors in world trade, Figure 3 presents data on exports and imports by sector of the OECD countries in 2004.

**Figure 3. Trade in services by sector, total OECD, 2004**




*Source*: OECD (2006)

25. The OECD as a whole runs a small trade surplus in services with total exports amounting to $1709.6 billion and imports $1624.9 billions in 2004. Imports and exports have grown at the same pace over the past five years at 8.4% as the annual average (OECD, 2006). Other business services (OBS) refer to category 268 in the BPM5 and contain legal services, accounting, architecture and engineering. Travel, transport and other business services are by far the largest sectors in terms of trade value, while financial services is the services sector where the OECD countries have the largest relative trade surplus. Financial services, insurance, transport and other business services are also the services sectors for which domestic regulation is usually the most developed and most intensive. The empirical analysis in Section 4 below therefore focuses on financial services, other business services and total services trade.

26. Annex Tables A1 and A2 depict bilateral trade in other business services and financial services, the two services sectors that are selected for further empirical analysis. Only 20 out of 30 OECD countries report exports of other business services by destination, while 18 countries report on financial services. And even for these countries there are a number of gaps in the data. About half of total exports from the EU 15 went to other EU countries in other business services and about 55% in financial services.

**Domestic regulation**

27. Product-market regulation of countries may differ in many dimensions such as the sectoral coverage, the regulatory instruments, the responsible agencies, the legal status, the area of regulation, exemptions, transparency, and treatment of foreign companies. As a consequence, cost impacts for individual companies may be quite different. In empirical trade models all these aspects must be simplified and quantified in meaningful quantitative indicators. The present paper distinguishes and compares two approaches in this regard. The first approach quantifies a country's relative regulation intensity compared to other countries, and another approach stresses the (bilateral) degree of heterogeneity in product-market regulation.

28. The OECD Economics Department developed a detailed database with indicators of product-market regulations for member states. The database is mainly formed by official government responses to the OECD Regulatory Indicators Questionnaire. The first version of the database referred to the reference year 1998 and consisted of some 1600 items of product-market regulation for each country. A later version for 2003 reduced the number of items to some 805 (Conway et al., 2005). The OECD International Regulation database also contains some detailed information on regulation items in a few specific service sectors (retail trade, telecommunication, transport, energy distribution, professional services), but on the

whole the information concerning the product regulation in the OECD member states is of a more general nature. Table 1 provides an overview and summary of the data points.

**Table 1. Number of basic data points in the OECD regulatory indicators questionnaire 2003.**

| Section | Data points | Short description |
|---|---|---|
| **Section 1: General policies**<br>1.1 Firm ownership, control and legal status<br>1.2 Antitrust exclusion and exemptions<br>1.3 Market access, market dominance and vertical separation of network sectors | **223**<br>129<br>6<br>88 | Section 1 focuses on public ownership, market access and competition issues, market structure and vertical relationships in utilities and other network industries. |
| **Section 2: Regulatory and administrative procedures**<br>2.1 Regulation<br>2.2 The treatment of foreign parties | **44**<br>32<br>12 | Section 2 focuses on regulatory processes and capacities in the public administration. |
| **Section 3: Administrative requirements for business start-ups** | **129** | Section 3 focuses on the administrative requirements that entrepreneurs must satisfy in order to start a business. |
| **Section 4: Regulation of professional services**<br>4.1 Exclusive and shared exclusive tasks<br>4.2 Entry requirements<br>4.3 Treatment of foreign professionals<br>4.4 Regulations on market behaviour | **227**<br>83<br>36<br>32<br>76 | Section 4 focuses on regulations that may have an impact on the accounting, legal services, engineering and architectural professions. |
| **Section 5: Regulation in transport industries**<br>5.1 Road freight<br>5.2 Railways<br>5.3 Air travel (non freight) | **131**<br>25<br>74<br>32 | Section 5 focuses on regulations affecting access, business conduct and industry and market structure in three transport sectors: road freight, railways and passenger air travel. |
| **Section 6: Regulation in the retail distribution industry**<br>6.1 Regulatory environment<br>6.2 Industry behaviour<br>6.3 Prices | **51**<br>31<br>13<br>7 | Section 6 focuses on regulations affecting access and business conduct in the retail sector |
| **Total** | 805 | |

*Source*: Conway et al. (2005).

29. The basic data are used to calculate composite indicators or 'summary indicators'. A few steps are taken for doing this. The country answer for each item is coded and ordered in a scale ranging from 0 to 6.[10] The next step is to aggregate the items to summary indicators. The summary indicators are obtained by means of factor analysis, in which each component of the regulatory framework is weighted according to its contribution to the overall variance in the data. The methodology is described in Nicoletti, Scarpetta and Boylaud (2000). In this way summary indicators for the relative strictness of regulations by country, by policy area, and to some extent also by economic sector are constructed. Five sub-domains of product-market regulation for which summary indicators have been developed are: *barriers to competition*; *administrative barriers for start-ups; regulatory and administrative opacity; explicit barriers to trade and investment;* and *state control.* Details for the sub-domain indicators can be found in Conway et al. (2005).[11]

30. The regulation-intensity indicators give important information on the possible trade-hampering impact of national regulations. If there are two countries A and B with regulation-intensity indicators of,

[10] The indicator ranges from 0 for the least restrictive to 6 for the most restrictive regulation level, based on a pre-defined ranking. The restrictiveness ranking adds a subjective element to the indicator.

[11] The aggregate product market regulation index used in the regressions contains information from all sections in Table 1. The lower level indicators (see Figure 4 below) also contain information from several sections in Table 1. There is in other words no one-to-one relationship between the data points summarised in Table 1 and the sub-domains of product market regulation.

respectively, 4.5 and 2.5 we may safely assume that foreign service exporters are more likely to face regulation-based trade barriers in country A than in country B. Empirical research by Nicoletti, Golub et al. (2003) indeed confirms this expectation. However, these regulation-intensity indicators describe only one element of the trade-barrier impact of domestic regulations. Suppose two countries have a regulation-intensity indicator of say 2.5. This regulation intensity is calculated as an average over many individual items in product-market regulation. But it would be a fallacy to assume that an average score of 2.5 means that both countries have identical regulations in place. Indeed, the underlying regulatory measures in the two countries may well be completely dissimilar. In the OECD International Regulation database and elsewhere it is well-documented that countries may have very different types of regulation for one sector, even within one trade block like the EU.[12] The degree of regulation heterogeneity can be assumed to correlate positively with fixed compliance and information costs for the exporting services firm. The country specificity of the regulations limits the firm's potential scale effects that could otherwise be attained in complying with national regulations.

31. Kox and Lejour (2004; 2005) develop a new index for bilateral policy heterogeneity.[13] Their indicator is based on detailed comparisons between individual country pairs for specific aspects of product market regulation, both regarding the form and the contents of the regulation. This yields binary information per policy item: if two countries have a different policy in place the assigned dissimilarity value is one, and zero otherwise. The procedure is repeated for some 130 different policy items. The scores per country pair are averaged to yield an average policy heterogeneity indicator for each country pair. The procedure is described in more technical detail in Annex 3. The value of the average indicator ranges between *1* in case of complete dissimilarity and *0* in case of identical product-market regulations. The results can also be decomposed for the domains of product-market regulation, following the same classification as used by the OECD Economics Department. The results for the overall heterogeneity index for the five sub-domains of product-market regulation identified in the OECD regulation database are shown in Table 2.

[12] A more detailed picture of the heterogeneity of regulation policies between countries for business services is given in OECD (1996) and CSES (2001).

[13] They build on earlier work by the OECD Economics Department, in particular the results of the OECD Regulatory Indicators Questionnaire.

**Table 2. Relative intensity and average policy heterogeneity, country averages (unweighted) for policy heterogeneity variables with respect to all OECD partners, 2003**

| Country | Regulation Intensity, all policy areas (PMR) | Regulation Heterogeneity | | | | | |
|---|---|---|---|---|---|---|---|
| | | All policy areas (PMR) | State Control | Administrative Barriers for Start-ups | Barriers to Competition | Regulatory and Administrative Opacity | Explicit Barriers to Trade and Investment |
| Australia | 0.9 | 0.413 | 0.412 | 0.640 | 0.412 | 0.294 | 0.298 |
| Austria | 1.4 | 0.373 | 0.407 | 0.549 | 0.287 | 0.346 | 0.279 |
| Belgium | 1.4 | 0.341 | 0.375 | 0.563 | 0.225 | 0.268 | 0.296 |
| Canada | 1.2 | 0.366 | 0.408 | 0.554 | 0.253 | 0.292 | 0.326 |
| Czech Rep. | 1.7 | 0.353 | 0.374 | 0.616 | 0.239 | 0.297 | 0.278 |
| Denmark | 1.1 | 0.368 | 0.367 | 0.588 | 0.372 | 0.220 | 0.320 |
| Finland | 1.3 | 0.324 | 0.360 | 0.570 | 0.209 | 0.205 | 0.271 |
| France | 1.7 | 0.358 | 0.389 | 0.541 | 0.264 | 0.286 | 0.331 |
| Germany | 1.4 | 0.361 | 0.371 | 0.532 | 0.307 | 0.218 | 0.388 |
| Greece | 1.8 | 0.372 | 0.390 | 0.592 | 0.247 | 0.344 | 0.323 |
| Hungary | 2.0 | 0.376 | 0.397 | 0.673 | 0.249 | 0.255 | 0.367 |
| Iceland | 1.0 | 0.370 | 0.394 | 0.572 | 0.338 | 0.277 | 0.279 |
| Ireland | 1.1 | 0.338 | 0.362 | 0.602 | 0.202 | 0.285 | 0.271 |
| Italy | 1.9 | 0.379 | 0.434 | 0.617 | 0.263 | 0.222 | 0.314 |
| Japan | 1.3 | 0.390 | 0.439 | 0.629 | 0.254 | 0.299 | 0.328 |
| Korea | 1.5 | 0.369 | 0.443 | 0.638 | 0.229 | 0.220 | 0.286 |
| Luxembourg | 1.3 | 0.310 | 0.374 | 0.649 | 0.189 | 0.223 | 0.227 |
| Mexico | 2.2 | 0.393 | 0.384 | 0.634 | 0.328 | 0.279 | 0.460 |
| Netherlands | 1.4 | 0.331 | 0.357 | 0.558 | 0.224 | 0.270 | 0.270 |
| Norway | 1.1 | 0.370 | 0.383 | 0.629 | 0.281 | 0.255 | 0.292 |
| New Zealand | 1.5 | 0.366 | 0.404 | 0.584 | 0.269 | 0.287 | 0.271 |
| Poland | 2.8 | 0.389 | 0.466 | 0.600 | 0.226 | 0.237 | 0.317 |
| Portugal | 1.6 | 0.366 | 0.386 | 0.553 | 0.274 | 0.398 | 0.278 |
| Slovak Rep. | 1.4 | 0.368 | 0.390 | 0.644 | 0.200 | 0.230 | 0.365 |
| Spain | 1.6 | 0.366 | 0.413 | 0.622 | 0.201 | 0.272 | 0.296 |
| Sweden | 1.2 | 0.387 | 0.496 | 0.575 | 0.230 | 0.220 | 0.286 |
| Switzerland | 1.7 | 0.368 | 0.372 | 0.643 | 0.259 | 0.282 | 0.387 |
| Turkey | 2.3 | 0.386 | 0.459 | 0.568 | 0.225 | 0.329 | 0.335 |
| UK | 0.9 | 0.360 | 0.407 | 0.590 | 0.236 | 0.253 | 0.296 |
| USA | 1.0 | 0.382 | 0.454 | 0.584 | 0.307 | 0.222 | 0.328 |
| | | | | | | | |
| st.deviation | | 0.021 | 0.034 | 0.037 | 0.051 | 0.045 | 0.046 |
| coefficient of variation | | 0.058 | 0.086 | 0.061 | 0.197 | 0.166 | 0.146 |

*Source*: calculations CPB, The Hague, using data from OECD International Regulation Database

32. PMR intensity levels vary between 0.9 for the U.K. and 2.8 for Poland, whereas unweighted PMR heterogeneity levels vary between 0.31 (Luxembourg) and 0.41 (Australia). The range of variation for trade-weighted heterogeneity indicators is about the same, but at the country level the performance is different.

33. A question can be whether both types of indicators for national policy differences really yield different information. If the information in one of both indicators would already be implied by the other indicator, then the other indicator is more or less redundant and can be skipped. Intuitively, one would expect that the relative intensity level is more general than the heterogeneity indicator, for the simple reason that having more rules easily leads to also having different rules. A simple regression actually fails

to establish a significant relationship between the regulatory intensity and heterogeneity indicators. This confirms that both really measure different aspects of national policy differences. The reason is probably found in historical patterns of regulation. Product-market regulation in services often has a long history. Each authority has over time developed its own system of quality safeguards for domestic buyers, with its own rules and agencies. Many service industries were until quite recently hardly exposed to foreign competition, so there was not much reason for policy convergence. Globalisation, economic integration and the active search for best practices in regulation have brought about a move towards reduced policy heterogeneity in last decades.[14] Estimates of the gains from further harmonisation (or mutual recognition) are provided in the next section.

## 4. EMPIRICAL ESTIMATES FOR TOTAL SERVICES TRADE AND OTHER BUSINESS SERVICES

34. This section applies the gravity model for estimating the impact of regulatory measures on trade flows and on market entry.[15] The regulatory indices chosen for the analysis are those that correspond the most closely to the areas of regulation mentioned in Article VI.4 in the GATS. However, as discussed in previous sections of this study, a perfect match between available indices and the GATS cannot be found. We start by exploring to what extent trade in goods and services respond differently to natural and regulatory barriers to trade. For this purpose a standard gravity model extended by aggregate indicators for institutional quality and government capacity to regulate is estimated. Given the nature of services as discussed in the introduction, we expect that regulatory barriers to trade in services and natural barriers due to differences in language, culture and institutions, impede trade in services more than trade in goods.

35. Second, the relation between regulation and trade in services is explored in detail, looking at more specific regulatory indices as well as more disaggregated services trade data. We focus on two aspects of domestic regulation: the average intensity level of regulation (each country compared to the OECD average), and the bilateral heterogeneity in regulation that may confront the individual firm (comparing two individual countries). Not all countries trade services with each other. We therefore make a distinction between the effect of regulation on the decision to trade or not to trade and on subsequent trade flows, if any. If trade does take place, we estimate the relation between regulatory indices and the value of bilateral trade for total services and other business services. The hypothesis is that the regulatory indices, both intensity and heterogeneity, are negatively related to market entry.[16] This would support the assumption that regulation is associated by significant fixed costs. However, lack of such evidence does

14 Cf. evidence shown in Nicoletti & Scarpetta (2003); Conway et al. (2005).

15 The gravity model explains bilateral trade as a function of the trading partners' market size, and bilateral trade costs relative to all other trading partners. Trade costs in turn include transport, tariffs and a host of administrative costs related to crossing the border, translating information to a foreign language and cultural context and entering and enforcing contracts with foreign suppliers. Commonly used measures of such costs are the distance between the trading partners, whether or not they have a common border, whether or not they share a common language and whether or not one or both are members of a regional trade agreement. See technical annex for model specification and methodology.

16 As argued in section 2, regulation can also reduce trade costs by setting common standards and reduce information asymmetries. The regulation indices presented above, however, mainly reflect regulation that restricts businesses activities.

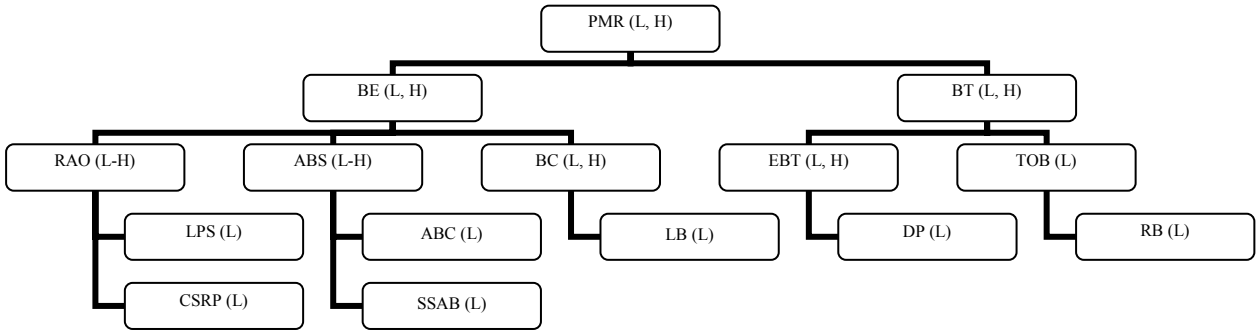
not mean that regulation does not impose fixed costs – just that they are not prohibitive. We also expect that regulatory indices may have a larger impact on business services than the average for services, since business services are presumably more complex and subject to more information asymmetries that justify regulation than average. Ideally, the study should apply firm-level data, but such data are not available, and an analysis of trade data at a sectoral level is the best that can be done.

36. Third, the section explores the relation between regulatory indices and actual trade values (including reported zero flows). Here again our hypothesis is that both regulation intensity and heterogeneity have a negative impact on trade flows. There is, however, the possibility that regulation strongly affects firms' choice of mode of entry in export markets in cases where modes are substitutes. Regulation that firms regard as onerous could for instance deter them from establishing a commercial presence in the country but engage in cross-border trade instead.[17] Again we expect regulation to have a larger impact on other business services than for average services trade.

37. Finally, the section explores the correlation between FDI inward and outward flows and regulation indices. OECD produces data on FDI stocks and flows by country and by sector, but not bilateral flows by sector. The analysis is therefore conducted using FDI flows from/to all countries by sector. It gives an indicator of how regulatory indices are related to FDI flows, but causality cannot be established at this stage.[18] We would expect that FDI flows are negatively related to regulatory barriers, and probably more strongly than trade flows when the two modes of trade are substitutable.

38. The regulatory barriers that come closest to representing the regulatory measures falling under GATS Article VI.4 are presented in Figure 4 which depicts a hierarchy where subordinate indicators are included in the main indicator above it:

**Figure 4. Regulatory measures included in the regressions**




*Notes*: PMR: product market regulation; BE: Barriers to entrepreneurship; BT: Barriers to trade and investment; RAO: Regulatory and administrative opacity; ABS: Administrative burden on start-ups; BC: Barriers to competition; EBT: Explicit barriers to trade and investment; TOB: Other barriers; LPS: License and permit system; CSRP: Communication and simplification of rules and procedures; ABC: Administrative burdens for corporations; LB: Legal barriers, SSAB: Sector specific administrative burden (retail and road transport); DP: Discriminatory procedures; RB: Regulatory barriers. The letters in parentheses indicates data on regulatory levels (L) and heterogeneity (H).

17 In order to explore this possibility bilateral data on FDI stocks and flows by services sector is needed, but not yet available.

18 Kox and Lejour (2006) found a negative effect of both regulation intensity and heterogeneity on bilateral FDI stocks in the EU.

39. As explained in Section 3, the indicators are aggregated on the basis of factor analysis and the borderline between the different categories is not always sharp.[19] In selecting the indicators to use in the regressions we started at the most disaggregate level and identified the indicators that come closest to covering the types of regulation mentioned in Article VI.4 of the GATS. Licence and permit systems (LPS) are explicitly mentioned in Article VI.4, while licensing procedures and qualification procedures are at least partly captured by the communication and simplification of rules and procedures (CSRP), sector specific administrative burden (SSAB), discriminatory procedures (DP), and administrative burdens for corporations (ABC). The latter is most relevant for mode 3. Regulatory barriers (RB) capture to what extent the country is party to agreements on international harmonisation or mutual recognition of regulation, and thus go beyond the scope of Article VI in the GATS. Nevertheless, this indicator is highly relevant to regional agreements and to the discussion of the impact of regulatory heterogeneity in general and on technical standards and qualification requirements in particular. We finally included legal barriers (LB), which relates to limitations on the number of competitors allowed in the sector. This is a market access issue, while procedures related to its implementation may be considered a domestic regulation issue.

40. A country's regulation is based on policy objectives and capacity to implement regulation. Individual regulatory indices are therefore often highly correlated as they reflect the same underlying objectives and capacities. For this reason it may be difficult to isolate the impact of one specific regulatory indicator in empirical analysis. We therefore start by estimating the relation between trade and regulation with the most aggregate regulatory indicators that contain the detailed indicators discussed above. These estimates capture the relation between regulation in general and services trade, but does not provide much specific information on the proposed disciplines on domestic regulation under GATS Article VI.4. The detailed indicators are therefore entered into the regressions, one at a time, and the results indicate which indicator is likely to have an effect on services trade and the relative importance of the indicators.

**Is services trade different from merchandise trade?**

41. For this analysis we utilise the entire dataset for services trade, containing 29 reporting countries and 68 partner countries. The set should in principle have 1972 observations per year per sector and 9860 observations per sector for the entire period. There are, however gaps in the database and for total services we only have 5544 observations.[20] Missing observations could cause biased estimates if the trade performance of countries not reporting is systematically different from those that do report. It is for instance conceivable that those countries that do not report services trade have weaker institutions than those that do, resulting in a possible underestimation of the impact on governance on trade flows. The regulatory indices used in these regressions are government efficiency and regulatory quality taken from Kaufman et al. (2006) of the World Bank. The indicators are based on comprehensive surveys and expert assessments. Government effectiveness refers to "*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 the credibility of government commitment to such policies*". Regulatory quality refers to "*the ability of government to formulate and implement sound policies and regulations that permit, and promote private sector development"*. [p. 4]. The qualitative information is converted to indicators ranking from -2.5 to 2.5, with higher values indicating better performance. De Groot et al. (2004) found that good governance as represented by these indicators had a significant positive impact on merchandise trade.

42. There were no zero trade flows for total merchandise trade among the 29 reporting and 68 partner countries, and it is therefore not meaningful to compare the determinants of market entry between goods

19 See Boylaud et al. (2000) for a description of the aggregation process.

20 The tables below report the number of observations for each regression.

and services using this sample. The comparison is therefore limited to observed trade flows and is presented in Table 3.

**Table 3. Explaining observed trade flows, comparing total services and total merchandise trade**

| Variable | Government efficiency | | Regulatory quality | |
|---|---|---|---|---|
| | Services | Goods | Services | Goods |
| GDP reporter | 0.72*** | 0.71*** | 0.74*** | 0.70*** |
| | (0.02) | (0.01) | (0.02) | (0.02) |
| GDP partner | 0.79*** | 0.76*** | 0.80*** | 0.76*** |
| | (0.01) | (0.02) | (0.01) | (0.02) |
| Distance | -0.54*** | -0.64*** | -0.57*** | -0.63*** |
| | (0.03) | (0.02) | (0.03) | (0.03) |
| Language | 0.67*** | 0.51*** | 0.64*** | 0.48*** |
| | (0.06) | (0.05) | (0.05) | (0.05) |
| Border | 0.17** | 0.46*** | 0.24** | 0.49*** |
| | (0.08) | (0.06) | (0.08) | (0.07) |
| Both EU | -0.07 | 0.07 | -0.14** | 0.06 |
| | (0.07) | (0.06) | (0.06) | (0.06) |
| Both NAFTA | -0.71*** | 0.18* | -0.84*** | 0.19* |
| | (0.13) | (0.11) | (0.13) | (0.11) |
| Regulation reporter | 0.95*** | -0.44** | 1.76*** | -0.20** |
| | (0.14) | (0.09) | (0.19) | (0.11) |
| Regulation partner | 1.51*** | 0.27*** | 1.71*** | 0.40*** |
| | (0.13) | (0.09) | (0.17) | (0.11) |
| Similar regulation | -0.20*** | -0.06 | -0.26*** | -0.13** |
| | (0.05) | (0.05) | (0.08) | (0.06) |
| Number of observations | 5146 | 8683 | 5139 | 8736 |
| Pseudo $R^2$ | 0.88 | 0.88 | 0.88 | 0.88 |

Note: Standard errors are in parentheses, *** and ** denote statistical significance at a 1% and 5% level respectively.

43. The first two columns depict the results for the government efficiency indicator while the third and fourth columns present the results for the regulatory quality index. The coefficients on GDP are similar for goods and services and they are also similar to the results of other studies using the same methodology.[21] Having a common language has a positive impact on bilateral trade both for goods and services, and more so for services. Since services often require direct communication between provider and customer, this is natural, but the difference is perhaps smaller than what one would expect. The coefficients indicate that countries trade 1.9 times more services with trading partners with which they share a common language, everything else equal, while they trade 1.6 times more goods with these partners. Borders, in contrast, matter much more for goods trade than for services trade. Countries tend to trade 1.6 times more goods with countries with which they have a common border, while the corresponding figure for services is 1.2.[22]

44. Turning to institutional and political factors, regulatory quality and efficiency play a much more important role for services trade than for merchandise trade. Good governance in the exporting as well as the importing country is strongly and positively related to exports of services. The larger importance of governance for services trade probably reflects the fact that services are intangible and less standardised

21 The reported results are from using the Poisson pseudo maximum likelihood (PPML) estimator. Regulatory indices are in logs. The coefficients are smaller than the results of studies using OLS. Since trade as a share of GDP is typically larger in small countries, it has been argued that the PPML estimator gives more reasonable results.

22 Some other studies have found that having a common border is insignificant for services trade (e.g. Kimura and Lee (2006) find that adjacency has no significant effect regressions with home fixed effects).

than merchandise trade. Contracts between suppliers and customers are therefore more difficult to enforce by the contracting parties, and have to be based more on sound regulation and trust than trade in goods.[23]

45. The negative parameter on the both EU and both NAFTA dummies is puzzling. The robustness of these results can be checked by introducing reporter and partner fixed effect. In these regressions the "both EU" dummy is positive and significant at a 1% level for services trade, but it remains negative and significant for merchandise trade, while the "both NAFTA" dummy is positive but statistically insignificant for merchandise trade and remains negative and statistically significant for services trade. We also explored replacing the EU15 dummy with the EU25 dummy, since the integration of new members started well before they actually became members. This variable had a significant and positive impact on trade in goods, but not services. The choice of mode of servicing the market could be an explanation also for merchandise trade. It is possible that with the level of integration that the EU and NAFTA markets offer, many firms prefer to service partner country markets through the establishment of affiliates there.

46. To conclude services and merchandise trade appears to be different, but the difference is mainly a matter of quantity than quality. The physical natural barriers appear to be smaller for services than for goods, while the cultural natural barriers appear to be larger. Institutions/governance, however, have a much larger and possibly a qualitative different impact on services exports.

**Determinants of market entry**

47. This section explores the relation between regulation and the probability to enter export market. The variable of interest is thus whether or not a pair of countries in the data sample trade in the service in question. If the data entry in the OECD bilateral trade statistics is zero, it is assumed that there is no trade, if the data entry is "-" or two dots, the data is considered as non-available and not included in the regression. Since we only have data for the OECD countries on domestic regulation, the analysis in this section is limited to the OECD countries.[24]

48. The results are presented in Table 4 for total services as well as for other business services. It reports the sign and statistical significance of each of the regulatory indices included, while the details, including the results for the control variables are found in annex tables A2.1 and A2.2. When the regression produced a significant difference between the coefficient on regulatory level indicators for the exporter and importer, this is marked by shading the cell representing the largest coefficient. Blank cells indicate that the index in question did not have a statistically significant impact.

[23] The negative and significant parameter on reporter regulation result for merchandise trade is puzzling and needs further investigation. It is, however not robust to the estimating technique. Using OLS the parameters are positive and significant.

[24] The "Both EU", common language and contiguous dummies predicted entry perfectly and were dropped by the regression program.

**Table 4. The relation between levels of regulation and market entry, regression results**

| Indicator | Total services trade | | | Other business services | | |
|---|---|---|---|---|---|---|
| | Exporter | Importer | Het. | Exporter | Importer | Het. |
| Product market regulation | | - (***) | - (**) | - (***) | - (***) | |
| Barriers to entrepreneurship | | - (***) | - (***) | - (**) | | |
| Barriers to trade and investment | - (**) | - (***) | - (***) | -(***) | -(**) | |
| Explicit barriers to trade and investment | - (**) | - (**) | - (**) | - (***) | | |
| Regulatory and administrative opacity | | + (***) | | | | |
| Administrative burden on start-ups | | - (***) | - (***) | - (***) | - (**) | |
| Barriers to competition | | | + (***) | | | |
| Other barriers | - (***) | - (***) | | - (***) | - (***) | |
| License and permit system | | | | | | |
| Communication and simplification of rules and procedures | - (***) | | | -(***) | -(***) | |
| Administrative burden for corporations | | - (***) | | -(***) | -(***) | |
| Sector specific administrative burden | - (**) | - (***) | | -(***) | -(***) | |
| Legal barriers | - (**) | - (**) | | | | |
| Regulatory barriers | - (**) | - (**) | | - (***) | -(***) | |

Note: *** and ** denote statistical significance at a 1% and 5% level respectively. Shading indicates the largest coefficient in case of substantial differences between reporter and partner country.

### *Total services trade (mode 1, 2 and 4)*

49. The results by and large support our hypothesis that regulatory indices constitute an entry cost for foreign providers:

- Aggregate regulatory indices are negatively correlated with service imports, suggesting that regulation can prevent foreign firms from entering the market;
- Regulation also appears to impede local firms from entering foreign markets, suggesting that domestic regulation at home can be a drag on local firms' international competitiveness;
- Regulatory heterogeneity appears to impede market entry;
- The heterogeneity index with the largest impact on entry is, not surprisingly "barriers to trade and investment", followed by the heterogeneity variable for overall product market regulation.

50. The regressions also produced some unexpected results. For instance administrative opacity is positively correlated with market entry. A possible explanation can be that firms are hesitant to invest in markets where the license system is non-transparent and cumbersome and where they face discriminatory procedures. They would therefore choose to service such countries through exports rather than investment. Another possible explanation could be that licence procedures even when non-transparent or discriminatory are correlated with more certainty and less risk for expensive litigation. More research is needed to investigate the robustness and reasons for this finding, but as seen below restrictive licensing procedures are also significantly and positively correlated with services export values.

***Other business services***

51. The regression results support our hypothesis that regulation can constitute a barrier to entry in other business services including professional services, but the results are somewhat mixed:

- Regulatory indices both in the exporting and importing country are significantly correlated with trade, but the relation is strongest in the exporting country. Thus, strict regulation at home appears to impose a drag on local firms' ability to engage in exports;

- Regulatory heterogeneity is not significantly correlated with market entry.

52. While the exporting country's GDP had a larger effect on the probability to export for total services, it is the importing country's market size that matters more for bilateral market entry in business services. In sum, smaller countries with few regulatory restrictions on their services providers tend to export business services to larger trading partners.

**Determinants of trade flows**

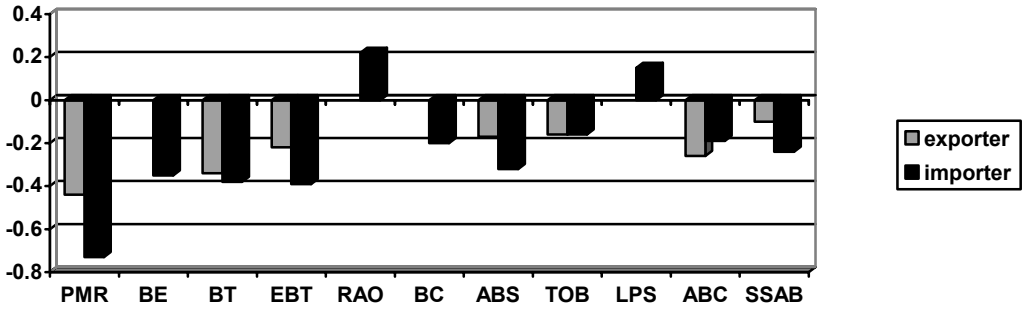
53. This section explores the relation between the regulatory indices presented in Figure 4 and trade values. A time dummy was also introduced in order to assess to what extent omitted variables that follow a time trend had an impact on services trade. Technological development is a case in point and one would for instance expect that developments in information and communication technology could have an impact on cross-border trade in services. We therefore introduced a time dummy which is 0 for 1999 and 1 for 2003, the two years for which data on regulation is available. The results for the variables of interest, the regulatory indices, are presented below, while the details can be found in annex tables A2.3 and A2.4.

***Total services trade***

54. We first note that the determinants of market entry and subsequent trade flows are largely the same. Starting with the heterogeneity indices, the following are statically significant and negatively related to trade: PMR, BE and BT (which is also their ranking according to parameter value). The regression results for the levels of the regulatory indices are presented in Figure 5, showing the elasticity of exports with respect to the regulatory index in question (i.e. the percentage change in exports associated with a one per cent change in the index value).[25]

[25] The coefficients on GDP are the same in these regressions as those presented in Table 4, and we do not repeat them here. The impact of physical natural barriers to trade, however, becomes smaller when only OECD countries are included in the sample. The coefficient on relative distance is -0.33 and the border dummy becomes insignificant. Common language has about the same effect on trade in these regressions as those presented in Table 4, while the "Both EU" dummy is highly significant and takes a value around 0.5 in the regressions, meaning that intra-EU trade is about 1.6 times larger than trade between non-members or between EU members and non-members, everything else equal.

**Figure 5. Regression results, the impact of regulation on total services exports (elasticities)**




55. As discussed above it can be difficult to distinguish the impact of indicators at a disaggregate level. This is reflected in the results where the aggregate indicators are the most statistically and economically significant. As we move towards the right in the chart, we move down in the hierarchy of indices and the relation to trade becomes less apparent. We notice that importer regulation has larger elasticities than exporter regulation for most indicators. However, all the elasticities are smaller than one, suggesting that the regulatory measures captured by the indices have a modest impact on total trade in services through modes 1, 2 and 4.

56. Perhaps surprisingly the time dummy turned out to be negative and statistically significant. Total predicted bilateral services exports within the OECD area was about 25% lower in 2003 than in 1999. A possible explanation is a shift in the direction of trade in services where emerging economies, notably India, have established themselves as major trading nations in services trade. These countries are not included in the database, but according to the most recent OECD statistics (OECD, 2006) on trade in services, the big 6 non-OECD countries' share in world services exports increased from 24% in 1999 to 40% in 2004.[26] Besides, the relative importance of mode 3 may have increased. The United States reports data on cross-border trade in services as well as sales to foreign persons by foreign affiliates of U.S. companies and these data show that there has indeed been a trend decline in cross-border exports relative to affiliate sales.[27]

57. We finally analysed what could happen if regulation was harmonised or mutual recognition was introduced.[28] Harmonisation could mean that countries converge towards a benchmark, for instance by adopting international standards where such standards exist. Another possibility is that countries move towards recognising each other's standards and qualifications. We used the aggregate product market

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26 The big 6 non-OECD exporters are Brazil, China, India, Indonesia, Russia and South Africa.

27 Cross-border exports accounted for 56 per cent of cross-border and affiliate sales in 1986, declining to 42 per cent in 1999 and further to 38 per cent in 2003. The corresponding figures for imports are 54 per cent in 1987, 40 per cent in 1999 and 37 per cent in 2003 (Bureau of Economic Analysis, 2006).

28 The methodology is the following: the parameters on the heterogeneity indices are first estimated by means of reporter and partner country fixed effect gravity regressions. This ensures that all unobserved country-specific variables, including the level of regulation are captured. The bilateral control variables included was common language, common border, both EU, and relative distance. Based on this regression results the bilateral trade flows were predicted. Finally the heterogeneity indices were changed as explained and the resulting changes in trade flows estimated by $\Delta X_{ij} = \beta \Delta HG$ where $\Delta$ indicates changes, X exports, and $\beta$ represents the estimated parameter on the heterogeneity index (HG).

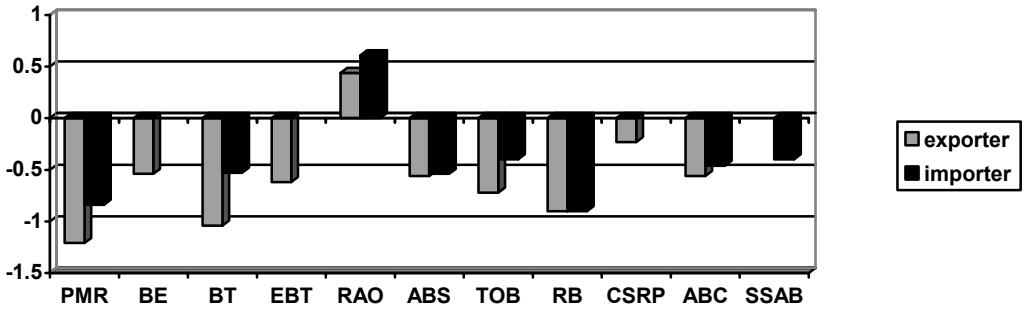
regulation index (PMR) for this exercise and constructed three scenarios. In the first the countries with the most divergent regulation reduce the regulatory heterogeneity between them to the average for all OECD country pairs, i.e. country pairs with a PMR heterogeneity index above average (which was 0.37 in 2003) harmonised regulation such that their index came down to the average, while those below average were unchanged. In this scenario, total services exports among the OECD countries increase by 2.5%. In the second scenario, we impose full harmonisation for the country pairs that have the most similar regulation initially. The heterogeneity index is set to zero for the countries that have an index below the mean (0.37) while there are no changes for the other country pairs. This increases total OECD exports by about 30%. Finally, full harmonisation within the OECD area, setting all PMR heterogeneity indices to zero is explored. This would imply either common standards or full recognition of other OECD service suppliers' standards and qualification requirements. It increases OECD exports of services by about 60% from the 2003 baseline. Luxembourg would experience the smallest increase, as its services trade is already large and its regulation not very trade restricting. The largest increases in services exports would be in Austria, Hungary, Italy, Portugal, Slovakia, Sweden and Turkey.

58. This estimate should be taken as a rough indicator because the scenario did not explicitly model how the harmonisation came about, and it is implicitly assumed that the coefficients on the country dummies stay the same. Given the multitude of country characteristics that are captured in the country dummy, it is probably not unreasonable to assume that the impact of the required change in regulatory levels in order to harmonise with trading partners (over and above the effect of harmonisation itself) would be small.

***Business services***

59. Business services are much more sensitive to regulatory restrictions as indicated by Figure 6, which shows the elasticity of exports with respect to regulatory indices. Here the aggregate product market regulatory index has an elasticity larger than unity.

**Figure 6. Regression results, the impact of regulation on other business services exports (elasticities)**




**Regulation and foreign direct investment**

60. The relation between regulation and inward and outward FDI flows is explored by regressing FDI flows on the relevant regulatory indices, controlling for market size, remoteness, regional trade dummies and a time trend. In the absence of bilateral FDI data, we analysed aggregate FDI flows for the 27 OECD countries included in our database.[29] We included the same regulatory indices as in the analysis of cross-

[29] We also did the regressions for FDI flows in business services. There are, however, a number of gaps in the data for this sector and the results were not entirely convincing.

border trade (see Figure 4). The results are presented in Table 5, which only reports the coefficients (elasticities) - all significant at a 1% level. Most of the regulatory barriers that are statistically significant are negatively related to both inward and outward FDI, and the effect is larger for outward investment. Regulation thus appears to be more effective in restraining local investors from going abroad than in restricting foreign entry. However legal barriers are positively related to FDI outward flows.

**Table 5. Regulatory measures and FDI flows, total services (elasticities)**

| Regulatory measure | Inward | Outward |
|---|---|---|
| Product market regulation | -1.35 | -2.93 |
| Barriers to entrepreneurship | -0.52 | -1.28 |
| Barriers to trade and investment | -1.00 | -2.57 |
| Explicit barriers to trade and inv. | -0.93 | -1.82 |
| Regulatory and adm. opacity | | 0.35 |
| Adm. burden on start-ups | -0.40 | -0.94 |
| Barriers to competition | -0.60 | -0.29 |
| Other barriers | -0.43 | -1.44 |
| License and permit system | -0.11 | -0.37 |
| Legal barriers | | 3.75 |
| Regulatory barriers | 0.55 | 0.35 |
| Comm. and simpl. of rules and procedures | -0.85 | -1.13 |
| Adm. burden for corporations | 0.20 | -0.43 |
| Sector specific adm. burden | -0.58 | -1.00 |

61. GDP was significant for inward FDI in all the regressions with an elasticity around 0.70, suggesting that inward FDI increases with the market size of the host country, but less than proportionally. In contrast the elasticity of outward investment was larger than unity (about 1.10) suggesting that outward FDI in services increases more than proportionally with the investing country's market size. The geographical remoteness of a country has a negative impact on both its inward and outward FDI flows and the impact is strongest for inward FDI flows. EU members also tend to have larger both inward and outward investments than non-EU members. The time trend was negative in all FDI regressions suggesting that extra-OECD investment flows may have increased in relative importance.

## 5. FINANCIAL SERVICES

62. Financial services warrant a separate section since there exists regulatory indices developed especially for this sector. Besides regulatory concerns are of a somewhat different nature, which is reflected in Annex on Financial Services in the GATS, which contains a section on domestic regulation that states that:

> "Notwithstanding any other provisions of the Agreement a member shall not be prevented from taking measures for prudential reasons, including for the protection of investors, depositors, policy holders or person to whom a fiduciary duty is owed by a financial service supplier or to ensure the integrity and stability of the financial system. Where such measures do not conform with the provisions of the Agreement, they shall not be used as a means of avoiding the Member's commitments or obligations under the Agreement".

63. Banking regulatory indices are available for 152 countries and cover nine broad indicators: Banking activity (which activities a bank is allowed to undertake), financial conglomerate (which types of firms a bank is allowed to own), competition (includes restrictions on foreign entry/ownership), capital stringency, two indices on supervision, private monitoring (e.g. accounting, auditing and rating requirements), deposit insurance, and external governance (similar to private monitoring, but focusing on the strength of audit, accounting practices and transparency). Each of these broad categories contains a number of more detailed indicators. The indicators that come closest to the Article VI.4 regulatory measures are competition regulatory barriers, which include license requirements, capital regulation, official supervision and private monitoring variables that all are related to standards.

64. We start by estimating how the regulatory indicators affect the entry of foreign banking services providers in foreign markets. The regressions are run for bilateral exports of financial services in 1999 and 2003 for 27 reporting/exporting countries and 29 partner countries.[30] It controls for the exporter and importer's GDP, the distance between them (adjusted for the distance relative to all other trading partners), whether the countries share a common border, whether they share a common official language, whether both countries are members of the European Union, and the overall quality of regulation in both the reporter and partner countries. The latter variable is from the Kaufman et al. (2006) governance indicators. It is included in order to adjust for capacity to implement regulation.[31] Finally, we included the share of foreign banks in the sector in order to investigate to what extent entry through cross border trade and commercial presence are complementary or substitutes.

65. Next, we estimated the determinants of actual trade flows, using the same control variables and regulatory indices as in the entry regressions.[32] The regulatory indices were included one by one in both sets of regressions. The indicators that turned out to have a statistically significant impact (at a 5% level or

30 Many of the indicators are only available for 2003, and regressions using these indicators are only on 2003 data.

31 Quality of regulation is also highly correlated with GDP per capita

32 The PPML estimator was used in the regressions.

better when controlling for reporter fixed effects and partner fixed effects respectively) are reported in Table 6. [33]

**Table 6. Regulation, market entry and exports of financial services**

| | Entry | | Export | |
|---|---|---|---|---|
| **Variable** | **Reporter** | **Partner** | **Reporter** | **Partner** |
| Regulatory quality* | + | | + | + |
| Overall activity restrictions | - | - | | |
| Overall financial conglomerate restrictions | | | - | |
| Entry into banking requirements | | + | | - |
| Overall capital stringency | | | + | |
| Initial capital stringency | | | + | |
| Capital regulatory index | | | + | |
| Official supervisory power | | + | | |
| Supervisory forbearance discretion | + | + | + | |
| Independent supervisory authority, banks | | | + | |
| Independence of supervisory authority – fixed term | | | - | |
| No explicit deposit insurance | - | | - | - |
| Certified audit required | + | + | | |
| Accounting standards (information required) | + | + | + | + |
| Strength of external audit | + | + | - | |
| Financial statement transparency | + | + | + | + |
| External rating and credit monitoring | - | | | |
| External governance | + | + | | |

* Regulatory quality applies to government regulation in general, not only the financial sector.

66. The control variables are significant and have the expected sign.[34] The "both EU" dummy has a statistically and economically significant impact on both the probability to enter the market and on subsequent trade flows. EU members are about 5.5 times more likely to enter each other's financial markets than other country pairs where one or neither trading partner is an EU member. The result thus suggests that the deeper integration in EU, including harmonisation of regulation, has had an impact on entry and trade flows beyond what is captured in the regulatory indices.

67. Another control variable of interest is the share of foreign bank ownership in the exporting and importing countries respectively. Here it is found that the share of foreign banks in the exporting country has no effect on exports (market entry or export value), while the partner (importing) country's share of foreign banks had a significant impact on the probability to export, but not on export value. It thus appears that entry through mode 1 and 3 are complementary. The results further suggest that there are little exports from foreign affiliates back to the home country. It also appears that the presence of foreign banks has no significant impact on the host country's export performance.

68. Turning to regulatory measures it is interesting to notice that while regulation in the reporter (exporter) and partner (importer) countries are both important for market entry, it is mainly regulation in

[33] We ran regressions including the level of regulation for reporters with partner fixed effects and vice versa.

[34] See annex table A2.6 for details on the regression results.

the exporting country that matters for trade flows. It is also noticeable the regulatory measures can be both positively and a negatively related to market entry and trade, depending on their nature.

***Which regulatory barriers are related to fixed trade costs and which are associated with variable trade cost? And which regulatory measures enhance and which impede trade****?*

69. From Table 6 we see that some regulatory measures are significantly related to market entry, others to export value and some to both. The regulatory measures that are most strongly related to trade, affecting both entry and trade values in both reporter and partner countries are accounting standards and financial statement transparency. These are both measures that could fall under technical standards addressed in GATS Article VI.4. The regression estimates suggest that a one standard deviation improvement in the financial statement transparency in the exporting country is associated with a doubling of exports, while a similar improvement in the importing country would increase trade by 13%. For accounting standards the corresponding relations are a 48% increase in exports following a one standard deviation improvement in the index in the exporting country and an 11% increase following a similar improvement in the importing country.

70. The regulatory measures that only affect market entry are overall capacity restrictions, official supervisory power, certified audit required and external rating and credit monitoring. The *overall capacity restraint* variable captures to what extent banks are allowed to engage in securities, insurance and real estate. The higher the index the more restricted is the bank's activities and this has a negative effect both on the probability that a local bank will engage in international trade and whether a foreign bank will enter the market.

71. *Official supervisory power* reflects to what extent the supervisory agent have the right to information, can take legal action and intervene in management decisions – the higher the value of the index the more power has the supervisory agency. The regression result suggests that a stronger supervisory power in the partner country slightly increases the probability to attract foreign suppliers, while it has no significant impact in the reporting country.

72. The *certified audit required* measures whether or not an external audit by a licensed or certified auditor is required. This is a dummy variable that takes the value 1 if audit is required, 0 otherwise. It turns out to be the regulatory measure included in the database that is the most strongly associated with market entry. Countries in which audits by a licensed or certified auditor is compulsory are more than six times more likely to export and import banking services than countries that do not. However, among the OECD countries, only Italy did not have this regulatory measure in 2003 (the year included in the regression).

73. *External ratings and credit monitoring* measures to what extent subordinate debt is an allowable or required part of capital and whether credit ratings are used for all the top ten banks. Higher values indicate better credit monitoring. This measure tends to impede the regulating country's banks entry into foreign markets. The effect is relatively small, however, and it appears not to have a significant impact on market entry in the partner country.

74. Measures that are related to trade values, but not to entry can be considered mainly as variable trade costs. All of these are only significant in the reporting (exporting) country, and all but two have a positive parameter. The measure with the largest economic impact is the *overall capital stringency* measure. The index captures capital requirements according to Basel 1 and the ways that the minimum capital adequacy is determined (i.e. weighing of credit risk, whether unrealised losses are deducted from book value of capital). Higher values of the index indicate greater stringency. A one standard deviation increase in the index increases exports by about 50% according to our estimate. *Initial capital stringency*

relates to what kind of assets can be counted as regulatory capital. Again higher values of the index indicates greater stringency and it has a positive, impact on trade flows, albeit much smaller than *overall capital stringency.* The c*apital regulatory index* is simply the sum of the two capital stringency measures. Restricting the scope of banks as captured in the *overall financial conglomeration restrictions* index has a negative impact on trade flows.

75. Finally, regulatory measures that relate both to entry and trade values have elements of both fixed and variable costs. Among these are as already mentioned certified audit required and financial statement transparency, which have a large impact on trade. In addition *strength of external audit* has positive impact on entry, but negative on export value. This variable relates to whether audit is compulsory, whether the audit report is submitted to the regulatory authority and whether the content of the audit report is regulated. Higher values indicate stronger external audit. A strong negative relation to reporter's exports appears to be driven by the United Kingdom, which has a low indicator on strength on external audit and high exports of financial services, and is thus an outlier in this regression. The parameter remains negative when excluding the United Kingdom from the regression, but it becomes much smaller and loses its statistical significance.

76. The extent to which regulatory barriers affect the market share of foreign banks in the host economy is also interesting. We tested this empirically by regressing the share of foreign banks on the regulatory measures entailed in the Barth et al. (2006) database, controlling for GDP and overall regulatory quality. The regressions included all countries in that database (145), and an OECD dummy was introduced in order to capture to what extent OECD countries are different in this respect. This dummy was found to be insignificant. Small countries and countries with a high score on the quality of government regulation tend to have a larger foreign ownership share. The regulatory measures that were statistically significantly related to the foreign banks share was the following (elasticities in parentheses)[35]:

- To what extent non-financial firms are allowed to own banks (a unit increase in the index reduces the foreign bank share by 29%)
- Official supervisory power (0.59)
- Strength of external audit (0.46)
- Aggregate index of external governance (1.16).

77. The same pattern appears here as in the cross-border trade analysis; restrictions on bank's activities and ownership tend to impede foreign supply of financial services, while strong governance indicators and strong supervisory power tend to attract foreign suppliers.

[35] The elasticity reflects the percentage change in the foreign share resulting from 1% change in the value of the regulatory index. The non-financial firm ownership indicator is a discrete variable where the level rather than the logs were used in the regression.

## 6. SUMMARY, POLICY IMPLICATIONS AND CONCLUSIONS

78. This paper has argued that regulatory measures affect the fixed costs of entering a market as well as the variable costs of servicing that market. The study has explained that market entry barriers limit the number of firms that can break even in a particular market. The higher the entry barrier relative to the size of the market, the smaller the number of firms that can break even after having incurred the entry cost. In the face of such entry costs, trade liberalisation, defined as a reduction in variable trade costs, would under realistic assumptions lead to an increase in trade and a global market concentration as the average firm size becomes larger. Competition need not be affected, however, since the total number of firms, local plus foreign, will in most cases increase.[36] Nevertheless, trade liberalisation in the face of significant entry barriers would have a negative effect on small and medium size enterprises' (SMEs) ability to enter foreign markets. If this is an unwanted side-effect of liberalisation, it can be mitigated by regulatory reforms aiming at reducing entry barriers.

79. Regulation of services sectors aims at correcting market failures such as asymmetric information, moral hazard, and market power due to economies of scale, to mention the most important. When such regulation successfully remedies market failure, they can potentially lower entry barriers and improve welfare. Furthermore, when regulation is harmonised between trading partners, it facilitates the integration of services markets. However, complying with regulation is usually not costless and governments do not have perfect information such that regulation will seldom eliminate market failure. The empirical part of this study has made an attempt to measure what the costs and benefits of regulations are in the context of international trade in services.

80. The regulatory measures mentioned in GATS Article VI.4: qualification requirements and qualification procedures, licensing requirements and licensing procedures, and technical standards are mainly related to upfront costs of entering a market. The empirical section of the paper focused on indicators that reflect the restrictiveness of regulation in these areas and assessed their impact on foreign market entry for services at an aggregate level as well as for other business services and financial services. It was found that aggregate measures of product market regulation as measured by the OECD regulatory indices is negatively related to both market entry and subsequent trade values. The effect is larger for other business services than for services on average, probably reflecting that other business services are more information-intensive and less standardised than services on average and therefore are more sensitive to regulation. However, looking at the specific regulatory measures, the empirical results are less clear-cut, but they do support the prediction that regulation in this area first and foremost constitutes a fixed trade costs. Finally, it is argued that foreign direct investment could be more sensitive to regulatory barriers than cross-border trade, since FDI involves a larger commitment of a firm's resources in the host country and thus a higher risk.

81. The data on regulation of the financial sector allowed a more comprehensive empirical analysis. A very interesting finding is that regulation aiming at ensuring appropriate standards *reduces* both fixed and variable costs of servicing foreign markets in financial services for cross-border trade and FDI. Regulation that seeks to restrict the types of services banks can engage in, in contrast, has a negative impact on financial services sector trade. Both for other business services and financial services we find that regulation in the *exporting* country has the largest impact on trade flows.

[36] Competition could however suffer in small countries if the entry barrier is large relative to the market.

82. From these findings the following policy lessons can be drawn:

- Well-designed domestic regulation in services characterised by imperfect competition, can reduce trade cost. Such regulation would be more beneficial when it is subject to international harmonisation or international standards where applicable.[37]

- Well-regulated domestic markets can enhance the competitiveness of local service suppliers in foreign markets.

- In contrast, excessive domestic regulation not only restricts foreign suppliers from entering the market, it can be even more effective in restricting domestic suppliers from entering foreign markets.

- Excessive and heterogeneous regulation discourages small and medium size enterprises from entering foreign markets to a larger extent than large multinational companies and may unintentionally contribute to market concentration.

- Small countries are more affected by own and trading partner regulation than larger countries. Harmonising regulation with large trading partners could reduce trade costs for domestic firms in small countries. Costs of reforms in that regard need to be taken into account, however.

- Declining variable costs to trade in services due to trade liberalisation and improvements in communication technology contributes to rising average firm size. Regulatory reforms would help lower entry barriers and contribute to a conducive environment for SMEs.

***What are the implications of these lessons for the GATS and other international trade agreements?***

83. Trade liberalisation in services and regulatory reforms should go hand in hand. It has been shown in this study that trade liberalisation alone could lead to international market concentration, while lowering entry barriers through regulatory reform could mitigate this effect. GATS commitments and disciplines on domestic regulation should be seen as complementary. In regional agreements aiming for deeper integration of services markets, harmonisation or mutual recognition of licence requirements, standards and qualification requirements would substantially enhance market integration.

84. Regulatory measures such as for instance qualification requirements have aspects of market access (Article XVI), national treatment (Article XVII) and domestic regulation (Article VI) in the GATS. Certainty about what falls under which Article is important. According to a recent paper by the WTO Secretariat, uncertainties in this area have in the past had the effect that countries have been reluctant to make commitments in the GATS out of fear of losing regulatory discretion (Adlung, 2006). If so, the issue needs to be clarified.

85. Our empirical results suggest that an unfavourable score on the indicator "communication and simplification of rules and procedures" is negatively related to exports, imports and FDI of total services and for outward FDI in other business services. Therefore, enforceable horizontal rules on transparency are likely to help stimulate trade and FDI in services, although large effects should not be expected from rules on transparency alone.

[37] GATS Article VI.5(b) states that international standards shall be taken into account when determining whether a member is in conformity with the obligations on regulation in sectors in which the country has taken specific commitments. It is in other words not required to adopt international standards.

86. Mutual recognition or harmonisation of regulation would reduce trade costs significantly. However, our results to this effect, which are strong and robust, are drawn from an analysis of OECD countries only, and it is not obvious that the result would carry over to the entire WTO membership. The nature of market failure that needs to be addressed through regulatory measures depends on the nature, development and complexity of the markets in question, while the capacity to regulate increases with the level of development.[38] Therefore mandating harmonisation of regulation under GATS Article VI.4 would probably be ill advised. Instead mutual recognition and harmonisation of standards could be *encouraged*.

***Areas of future research***

87. The current study has focussed on the impact of regulation on trade in services as defined in the IMF's balance of payments statistics. These cover GATS modes 1, 2 and to some extent 4, while mode 3 is not covered. Bearing in mind the relative importance of commercial presence, it would be useful to analyse how regulation affect this mode as well. When bilateral data on FDI and sales of foreign affiliates in the services sector becomes available, work could be done on analysing the relation between regulation and FDI. Furthermore, it is likely that the four modes of supply are related. A possible hypothesis is that commercial presence and cross-border trade are substitutes, while mode 4 is probably also complementary to modes 1 and 3. It would therefore be useful to assess to what extent regulation affects firms' choice of mode of supply. Another area of possible future research is further work on regulatory indicators at a more detailed sector level.

[38] There is for instance a strong correlation between the regulatory quality index used in the regressions in Section 4 and GDP per capita.

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# ANNEX 1. DETAILED TRADE STATISTICS

**Table A1. Exports of other business services by exporter (rows) and destination (columns), 2003, $ mill.**

| | AUS | CAN | CHE | CZE | HUN | ISL | JPN | KOR | MEX | NOR | NZL | POL | TUR | USA | EU | WLD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **AUT** | 6 | 5 | 654 | .. | .. | 2 | 32 | 13 | 2 | 3 | 1 | .. | 38 | 383 | 4104 | 6675 |
| **BEL** | 29 | 30 | 876 | .. | .. | 1 | 190 | 14 | 6 | 113 | 3 | .. | 28 | 3506 | 9281 | 14761 |
| **CZE** | 1 | 3 | 45 | .. | .. | 0 | 2 | 0 | 11 | 3 | 0 | .. | 1 | 65 | 551 | 1401 |
| **DNK** | 10 | 10 | 121 | .. | .. | 10 | 33 | 29 | 4 | 227 | 1 | .. | 5 | 317 | 2477 | 4894 |
| **ESP** | .. | .. | ... | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 13496 |
| **FIN** | 0 | 12 | 266 | .. | .. | 0 | 14 | 0 | 0 | 47 | 1 | .. | 0 | 133 | 1145 | 1980 |
| **FRA** | 0 | 218 | 1323 | ... | .. | 42 | 294 | 179 | 95 | 66 | 0 | .. | 360 | 5502 | 8419 | 24037 |
| **GBR** | 385 | 389 | 2656 | 89 | 62 | 13 | 1937 | 145 | 57 | 1362 | 28 | 124 | 94 | 11046 | 16900 | 44689 |
| **GRC** | 3 | 3 | 103 | .. | .. | 0 | 13 | 6 | 0 | 5 | 0 | .. | 7 | 179 | 778 | 1309 |
| **HUN** | 1 | 4 | 40 | .. | .. | 0 | 4 | 3 | 1 | 1 | 1 | .. | 2 | 177 | 943 | 1451 |
| **IRL** | -4 | 13 | 209 | .. | .. | 0 | 42 | .. | 56 | 7 | 7 | .. | 7 | 741 | 3189 | 6737 |
| **ITA** | 29 | 33 | 1246 | .. | .. | 1 | 227 | 31 | 21 | 59 | 6 | .. | 60 | 1814 | 14769 | 20826 |
| **JPN** | 505 | 282 | 533 | .. | .. | .. | | 496 | 6 | .. | 20 | .. | .. | 8052 | 5805 | 18056 |
| **KOR** | .. | .. | .. | .. | .. | .. | 1289 | .. | .. | .. | .. | .. | .. | 2708 | 995 | 6687 |
| **LUX** | 2 | 7 | 74 | .. | .. | 0 | 13 | 9 | 9 | 3 | 0 | .. | 3 | 276 | 1716 | 2257 |
| **NLD** | .. | 109 | 766 | .. | .. | .. | 246 | .. | .. | .. | .. | .. | .. | 3208 | 12643 | 23753 |
| **NOR** | .. | 104 | 86 | 0 | 1 | 6 | 44 | .. | .. | .. | .. | 4 | .. | 1046 | 2662 | 4386 |
| **PRT** | 2 | 3 | 159 | .. | .. | 2 | 1 | 2 | 3 | 10 | 0 | .. | 0 | 91 | 856 | 1214 |
| **SVK** | 1 | 1 | 16 | .. | .. | 0 | 0 | 0 | 0 | 1 | 0 | .. | 0 | 28 | 255 | 436 |
| **SWE** | 25 | 41 | 836 | 180 | 152 | 1 | 104 | 66 | 7 | 409 | 4 | 82 | 47 | 1893 | 5789 | 11093 |

*Source*: OECD

**Table A2. Exports of financial services by exporter (rows) and destination (columns), 2003, $ mill.**

| | AUS | CAN | CHE | CZE | HUN | ISL | JPN | KOR | MEX | NOR | NZL | POL | SVK | TUR | USA | EU15 | OECD | WLD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **EU15** | 301 | 420 | 4129 | .. | .. | 12 | 1959 | 224 | 93 | 379 | 29 | .. | .. | 189 | 8802 | 29435 | .. | 53519 |
| **AUT** | 0 | 1 | 69 | .. | .. | 0 | 3 | 1 | 0 | 0 | 0 | .. | .. | 6 | 85 | 594 | 762 | 994 |
| **BEL** | 2 | 7 | 72 | .. | .. | 0 | 38 | 4 | 1 | 5 | 2 | .. | .. | 6 | 338 | 1826 | 2312 | 2529 |
| **CZE** | 0 | 0 | 1 | .. | .. | 0 | 0 | 0 | 0 | 0 | 0 | .. | .. | 0 | 7 | 76 | 112 | 173 |
| **FIN** | 0 | 0 | 1 | .. | .. | 0 | 0 | 0 | 0 | 0 | 0 | .. | .. | 0 | 1 | 25 | 29 | 34 |
| **FRA** | 2 | 2 | 42 | .. | .. | 0 | 16 | 2 | 1 | 3 | 0 | .. | .. | 10 | 186 | 373 | 645 | 1069 |
| **GRC** | 0 | 0 | 3 | .. | .. | 0 | 0 | 1 | 0 | 0 | 0 | .. | .. | 0 | 16 | 50 | 74 | 85 |
| **HUN** | 0 | 1 | 3 | .. | .. | 0 | 0 | 0 | 0 | 0 | 0 | .. | .. | 0 | 86 | 80 | 173 | 190 |
| **IRL** | 11 | .. | 60 | .. | .. | 0 | 121 | 5 | 1 | 3 | -1 | .. | .. | 1 | 787 | 2085 | 3008 | 3712 |
| **ITA** | 0 | 0 | 16 | .. | .. | 0 | 2 | 0 | 3 | 0 | 0 | .. | .. | 1 | 53 | 783 | 871 | 881 |
| **JPN** | 17 | 12 | 18 | .. | .. | .. | .. | 16 | 7 | .. | 0 | .. | .. | .. | 1442 | 1326 | 2851 | 3474 |
| **LUX** | 4 | 20 | 2745 | .. | .. | 7 | 528 | 22 | 9 | 36 | 1 | .. | .. | 19 | 680 | 9235 | 13326 | 14198 |
| **NLD** | .. | 1 | 36 | .. | .. | .. | 3 | .. | .. | .. | .. | .. | .. | .. | 136 | 396 | .. | 674 |
| **NOR** | .. | 5 | 3 | 0 | 2 | 1 | 7 | .. | .. | .. | .. | 5 | 0 | .. | 89 | 423 | .. | 551 |
| **PRT** | 0 | 0 | 7 | .. | .. | 0 | 0 | 0 | 0 | 0 | 0 | .. | .. | 0 | 11 | 125 | 144 | 161 |
| **SVK** | 0 | 0 | 0 | .. | .. | 0 | 0 | 0 | 0 | 0 | 0 | .. | .. | 0 | 5 | 36 | 55 | 57 |
| **ESP** | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1896 |
| **SWE** | 1 | 2 | 39 | 0 | 10 | 0 | 3 | 0 | 4 | 51 | 0 | 1 | .. | 2 | 113 | 437 | 667 | 882 |
| **GBR** | 267 | 312 | 769 | 15 | 28 | 3 | 1208 | 182 | 39 | 234 | 24 | 51 | 1 | 91 | 5486 | 8989 | 17708 | 21882 |

## ANNEX 2. THE GRAVITY MODEL, ESTIMATING METHODOLOGY AND RESULTS

The gravity model is the workhorse model for empirical analysis of the relation between trade costs and trade flows. Until recently most empirical studies applied the model in a straight forward way (using ordinary least square (OLS) regressions on its log transformation), but recent research has shown that this produces biased results. In particular, omitting zero flows may result in a selection bias, trade costs need to reflect the fact that relative rather than absolute trade costs matter for bilateral trade flows and OLS estimates are not efficient.[39] The methodology applied here seeks to avoid these problems. First, the probability to enter export markets is estimated based on the following function:

$$\rho_{ij} = \Phi\left( \alpha_0 + \alpha_1 \ln gdp_i + \alpha_2 \ln gdp_j + \alpha_3 \ln(dist_{ij} /(rem_i * rem_j)) + \sum_k \alpha_k dum_k + \sum_s \alpha_s t_s \right) \quad (1)$$

Our concern with fixed costs makes the determinants of entry interesting in its own right. The equation represents the probability to export services as a function of the usual gravity variables – the trading partners' market size as represented by their GDP, the distance between them adjusted for weighted average distance to all other trading partners (weighted by GDP) and a number of dummy variables representing geography, history and trade policies.[40] The dummy variables included are the following: whether or not trading partners have a common border, whether or not they share a common language, whether or not one or both are members of the European Union or NAFTA. In addition we have constructed a dummy variable that reflects similarity in the quality of government regulation. It takes the value of one if the country pair's score on the World Banks' governance indices differ by less than one standard deviation and zero otherwise. This measure indicates whether the trading partners have a similar capacity to implement regulation rather than similarities in the specifics of regulation.

A methodology for estimating the gravity model of trade flows that has proved to be unbiased, effective and allows the inclusion of zero flows is the Poisson pseudo maximum likelihood (PPML) (See Santos Silva and Tenereyro (2006) for a discussion). We use this method to estimate the impact of regulatory measures on trade flows as follows:

$$X_{ij} = \frac{Y_i Y_j}{d_{ij} T_{ij}} \quad (2)$$

Here $Y$ represents the GDP of the exporting and importing country, d the distance between them and $T$ is a measure of trade costs including the same components as in equation (3) unless otherwise stated.

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39 See Anderson and van Wincoop (2004),Baier and Bergstrand (2006); Helpman et al. (2006), Santos Silva and Tenreyro (2006) for a discussion.

40 A dummy variable takes the values one or nil; one if true (e.g. if a country pair has a common border) and 0 if false.

**Table A2.1. Regression results, probit, total services**

| | Reg 1 | Reg 2 | Reg 3 | Reg 4 | Reg 5 | Reg 6 | Reg 7 | Reg 8 | Reg 9 | Reg 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| lngdprep | 0.600*** | 0.579*** | 1.033*** | 1.047*** | 0.915*** | 0.959*** | 0.431*** | 0.756*** | 0.536*** | 0.627*** |
| | (0.183) | (0.185) | (0.315) | (0.353) | (0.249) | (0.319) | (0.128) | (0.191) | (0.145) | (0.163) |
| lngdppart | 0.560** | 0.569** | 1.007** | 0.999** | 0.935** | 0.970** | 0.336** | 0.671*** | 0.661*** | 0.573*** |
| | (0.258) | (0.257) | (0.455) | (0.519) | (0.432) | (0.438) | (0.148) | (0.231) | (0.190) | (0.218) |
| lndistrem | -0.736*** | -0.580*** | -1.066*** | -0.700*** | -1.230*** | -1.264*** | -0.758*** | -1.127*** | -0.923*** | -0.827*** |
| | (0.183) | (0.134) | (0.275) | (0.200) | (0.406) | (0.264) | (0.110) | (0.242) | (0.156) | (0.129) |
| lnRep rb 1 | -0.590 | -0.375 | -1.508** | -0.860** | 0.949 | -0.266 | -0.716*** | 0.010 | -0.538*** | -0.328** |
| | (0.610) | (0.647) | (0.653) | (0.447) | (0.535) | (0.254) | (0.228) | (0.079) | (0.197) | (0.156) |
| lnPart rb 1 | -1.372*** | -1.242*** | -2.302*** | -1.102** | 2.104*** | -1.525*** | -0.486*** | 0.310 | 0.082 | -0.588*** |
| | (0.431) | (0.436) | (0.758) | (0.520) | (0.766) | (0.408) | (0.134) | (0.169) | (0.442) | (0.208) |
| lnHeterog rb 1 | -6.555** | -3.281*** | -9.559*** | -5.760** | -1.607 | -3.772*** | | | | |
| | (2.872) | (1.349) | (3.842) | (2.764) | (1.578) | (1.556) | | | | |
| lnRep rb 2 | | | | | | -0.673 | | -0.454** | -0.175 | |
| | | | | | | (0.382 | | (0.222) | (0.171) | |
| lnPart rb 2 | | | | | | -0.334 | | -0.530** | -0.733*** | |
| | | | | | | (0.370) | | (0.235) | (0.165) | |
| lnHeterog rb 2 | | | | | | 3.986** | | | | |
| | | | | | | (2.092) | | | | |
| dumy5 | | | | | | | -0.132 | -0.207 | -0.038 | -0.002 |
| | | | | | | | (0.379) | (0.338) | (0.436) | (0.354) |
| lnRep rb 3 | | | | | | | | -0.601*** | | |
| | | | | | | | | (0.202) | | |
| lnPart rb 3 | | | | | | | | -0.525*** | | |
| | | | | | | | | (0.179) | | |
| | | | | | | | | | | |
| Number of obs. | 410 | 410 | 410 | 410 | 410 | 410 | 713 | 713 | 716 | 716 |
| Pseudo Loglikelihood | -18.758 | -19.548 | -10.432 | -13.647 | -15.794 | -14.330 | -39.861 | -34.875 | -37.019 | -37.229 |
| Wald chi2 | 30.58 | 30.09 | 33.01 | 26.40 | 20.85 | 29.67 | 52.77 | 36.39 | 52.45 | 55.42 |
| Prob > chi2 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 |

*Notes*: The standard errors are presented in parentheses. Values marked (***) and (**) are significant at the 1% and 5% levels, respectively. The regressions include the following regulatory indicies: Reg1: PMR, Reg2: BE, Reg3: BT, Reg4: EBT, Reg5: RAO, Reg6: ABS(1) and BC(2), Reg7: TOB, Reg8: LPS(1), LB(2) and RB(3), Reg9: CRSP(1) and ABC(2), Reg10: SSAB.

**Table A2.2. Regression results, probit, other business services**

| | Reg 1 | Reg 2 | Reg 3 | Reg 4 | Reg 5 | Reg 6 | Reg 7 | Reg 8 | Reg 9 |
|---|---|---|---|---|---|---|---|---|---|
| lngdprep | 0.396*** | 0.434*** | 0.342*** | 0.423*** | 0.466*** | 0.444*** | 0.492*** | 0.533*** | 0.557*** |
| | (0.080) | (0.733) | (0.780) | (0.075) | (0.081) | (0.066) | (0.066) | (0.079) | (0.076) |
| lngdppart | 0.632*** | 0.625*** | 0.567*** | 0.612*** | 0.636*** | 0.648*** | 0.696*** | 0.697*** | 0.731*** |
| | (0.107) | (0.102) | (0.099) | (0.096) | (0.101) | (0.080) | (0.084) | (0.099) | (0.095) |
| lndistrem | -0.419*** | -0.360*** | -0.313*** | -0.307*** | -0.406*** | -0.448*** | -0.463*** | -0.435*** | -0.434*** |
| | (0.109) | (0.109) | (0.104) | (0.114) | (0.124) | (0.087) | (0.088) | (0.110) | (0.091) |
| botheu | 0.494 | 0.782** | -0.093 | 0.309 | 0.744** | 0.442 | 0.528 | 0.836 | 0.601 |
| | (0.349) | (0.347) | (0.480) | (0.424) | (0.383) | (0.360) | (0.357) | (0.451) | (0.368) |
| lnRep rb 1 | -0.744*** | -0.503*** | -0.737*** | -0.396*** | -0.292*** | -0.577*** | -0.007 | -0.419*** | -0.264*** |
| | (0.222) | (0.203) | (0.214) | (0.138) | (0.108) | (0.148) | (0.042) | (0.132) | (0.075) |
| lnPart rb 1 | -0.505*** | -0.312 | -0.466** | -0.241 | -0.300** | -0.283*** | -0.002 | -0.543*** | -0.264*** |
| | (0.192) | (0.211) | (0.218) | (0.135) | (0.131) | (0.098) | (0.042) | (0.142) | (0.079) |
| lnHeterog rb 1 | 2.806 | 2.467 | 0.522 | -0.456 | 1.090 | | | | |
| | (2.186) | (1.528) | (1.176) | (0.695) | (0.805) | | | | |
| dumy5 | -1.000*** | -0.268 | | -0.731** | -0.248 | -0.408** | -0.394 | -0.830*** | -0.300 |
| | (0.397) | (0.315) | | (0.365) | (0.372) | (0.175) | (0.220) | (0.173) | (0.165) |
| lnRep rb 2 | | | | | -0.105 | | -0.122 | -0.214*** | |
| | | | | | (0.159) | | (0.108) | (0.082) | |
| lnPart rb 2 | | | | | 0.137 | | -0.136 | -0.192** | |
| | | | | | (0.202) | | (0.111) | (0.097) | |
| lnHeterog rb 2 | | | | | 1.421 | | | | |
| | | | | | (1.129) | | | | |
| lnRep rb 3 | | | | | | | -0.348*** | | |
| | | | | | | | (0.118) | | |
| lnPart rb 3 | | | | | | | -0.210*** | | |
| | | | | | | | (0.086) | | |
| | | | | | | | | | |
| Number of obs. | 496 | 496 | 339 | 496 | 496 | 685 | 685 | 688 | 688 |
| Pseudo Loglikelihood | -112.310 | -114.974 | -89.978 | -115.037 | -111.651 | -162.948 | -165.493 | -154.183 | -162.377 |
| Wald chi2 | 79.21 | 77.78 | 64.42 | 73.78 | 85.74 | 110.81 | 114.42 | 88.77 | 87.52 |
| Prob > chi2 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

*Notes*: The standard errors are presented in parentheses. Values marked (***) and (**) are significant at the 1% and 5% levels, respectively. The regressions include the following regulatory indicies: Reg1: PMR, Reg2: BE, Reg3: BT, Reg4: EBT, Reg5 ABS(1) and BC(2), Reg6: TOB, Reg7: LPS(1), LB(2) and RB(3), Reg8: CRSP(1) and ABC(2), Reg9: SSAB.

**Table A2.3. Regressions results, determinants of bilateral trade in total services (PPML)**

| Variable | Reg 1 | Reg 2 | Reg 3 | Reg 4 | Reg 5 | Reg 6 | Reg 7 | Reg 8 | Reg 9 |
|---|---|---|---|---|---|---|---|---|---|
| lnRep GDP | 0.74*** (0.03) | 0.76*** (0.03) | 0.75*** (0.03) | 0.74*** (0.03) | 0.78*** (0.03) | 0.76*** (0.03) | 0.78*** (0.03) | 0.76*** (0.03) | 0.79*** (0.03) |
| lnPart GDP | 0.70*** (0.03) | 0.74*** (0.03) | 0.74*** (0.03) | 0.72*** (0.03) | 0.74*** (0.03) | 0.76*** (0.03) | 0.75*** (0.03) | 0.74*** (0.03) | 0.77*** (0.03) |
| lnDistance | -0.31*** (0.05) | -0.31*** (0.05) | -0.31*** (0.05) | -0.30*** (0.05) | -0.32*** (0.05) | -0.29*** (0.05) | -0.34*** (0.04) | -0.31*** (0.04) | -0.32*** (0.04) |
| Language | 0.51*** (0.11) | 0.64*** (0.12) | 0.53*** (0.14) | 0.68*** (0.09) | 0.82*** (0.10) | 0.57*** (0.10) | 0.62*** (0.10) | 0.50*** (0.10) | 0.49*** (0.10) |
| Contiguous | 0.19 (0.12) | 0.09 (0.12) | 0.29 (0.17) | 0.17 (0.17) | -0.01 (0.12) | 0.22** (0.11) | 0.12 (0.12) | 0.24** (0.11) | 0.21* (0.12) |
| Both EU | 0.48*** (0.11) | 0.48*** (0.11) | 0.30*** (0.12) | 0.22** (0.09) | 0.45*** (0.10) | 0.45*** (0.10) | 0.46*** (0.10) | 0.61*** (0.10) | 0.49*** (0.11) |
| lnRep rb1 | -0.44*** (0.13) | -0.14 (0.13) | -0.34*** (0.13) | -0.22*** (0.07) | 0.03 (0.06) | -0.17*** (0.06) | -0.16** (0.07) | -0.14** (0.06) | 0.91*** (0.39) |
| lnPart rb1 | -0.73*** (0.12) | -0.35*** (0.12) | -0.38*** (0.12) | -0.39*** (0.08) | 0.22*** (0.06) | -0.32*** (0.06) | -0.16*** (0.06) | -0.17*** (0.06) | 0.23 (0.56) |
| HG_rb1 | -1.60*** (0.61) | -1.39*** (0.55) | -0.89* (0.50) | -0.26 (0.32) | -0.13 (0.27) | -0.17 (0.24) | | | |
| Rep rb2 | | | | | | -0.03 (0.06) | | -0.26*** (0.06) | -0.10* (0.06) |
| Part rb2 | | | | | | -0.20*** (0.07) | | -0.19*** (0.05) | -0.24*** (0.06) |
| HG rb2 | | | | | | -0.57 (0.40) | | | |
| Rep rb3 | | | | | | | | | |
| Part rb3 | | | | | | | | | |
| Time dum | -0.50*** (0.08) | -0.38*** (0.09) | -0.50*** (0.08) | -0.33*** (0.10) | -0.02 (0.09) | -0.33*** (0.07) | -0.22*** (0.08) | -0.30*** (0.08) | -0.22*** (0.07) |
| N | 906 | 906 | 675 | 906 | 906 | 906 | 1161 | 906 | 1166 |
| Pseudo $R^2$ | 0.87 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.85 | 0.86 | 0.86 |

*Note*: The robust standard errors are reported in parenthesis. ***, **, * denote significance at 1%, 5% and 10% respectively.

The regressions include the following regulatory indices: Reg1: PMR, Reg2: BE, Reg3:BT, Reg4: EBT, Reg5:RAO, Reg6: ABS + BC, Reg7:TOB, Reg8:CSRP+ABS, Reg9: Regulatory quality (from governance indicators)+SSAB.

**Table A2.4. Regressions results, determinants of bilateral trade in other business services (PPML)**

| Variable | Reg 1 | Reg 2 | Reg 3 | Reg 4 | Reg 5 | Reg 6 | Reg 7 | Reg 8 | Reg 9 |
|---|---|---|---|---|---|---|---|---|---|
| lnRep GDP | 0.85*** (0.05) | 0.91*** (0.04) | 0.89*** (0.05) | 0.89*** (0.04) | 0.90*** (0.05) | 0.92*** (0.04) | 0.87*** (0.04) | 0.88*** (0.04) | 0.95*** (0.04) |
| lnPart GDP | 0.78*** (0.06) | 0.83*** (0.06) | 0.80*** (0.09) | 0.79*** (0.06) | 0.81*** (0.05) | 0.84*** (0.05) | 0.81*** (0.06) | 0.83*** (0.06) | 0.88*** (0.05) |
| lnDistance | -0.44*** (0.08) | -0.41*** (0.08) | -0.39*** (0.09) | -0.40*** (0.07) | -0.29*** (0.08) | -0.39*** (0.08) | -0.48*** (0.08) | -0.41*** (0.07) | -0.43*** (0.07) |
| Language | 0.19 (0.30) | 0.44 (0.31) | 0.30 (0.40) | 0.51* (0.28) | 0.70*** (0.23) | 0.39 (0.27) | 0.27 (0.23) | 0.06 (0.26) | 0.05 (0.23) |
| Contiguous | 0.58** (0.25) | 0.45* (0.26) | 0.80 (0.49) | 0.42 (0.27) | 0.36 (0.24) | 0.62** (0.26) | 0.62*** (0.22) | 0.82*** (0.23) | 0.70*** (0.21) |
| Both EU | -0.04 (0.19) | 0.03 (0.18) | 0.40 (0.12) | -0.21 (0.19) | 0.41** (0.20) | 0.23 (0.20) | -0.07 (0.20) | 0.19 (0.10) | -0.11 (0.16) |
| lnRep rb1 | -1.21*** (0.31) | -0.54** (0.27) | -1.04*** (0.19) | -0.62*** (0.16) | 0.44*** (0.10) | -0.56*** (0.10) | -0.73*** (0.17) | -0.23** (0.10) | 3.90*** (0.75) |
| lnPart rb1 | -0.84*** (0.30) | -0.13 (0.22) | -0.53*** (0.19) | -0.15 (0.15) | 0.61*** (0.15) | -0.44*** (0.12) | -0.40*** (0.14) | -0.14 (0.12) | 0.26 (0.92) |
| HG_rb1 | -1.08 (1.26) | -2.40*** (0.92) | -2.06** (0.90) | -0.55 (0.57) | -0.80* (0.45) | 0.65 (0.53) | | | |
| Rep rb2 | | | | | | 0.16 (0.12) | | -0.56*** (0.09) | -0.07 (0.10) |
| Part rb2 | | | | | | 0.13 (0.13) | | -0.42*** (0.10) | -0.40*** (0.13) |
| HG rb2 | | | | | | -1.13* (0.73) | | | |
| Rep rb3 | | | | | | | | | |
| Part rb3 | | | | | | | | | |
| Time dum | -0.71*** (0.20) | -0.50*** (0.22) | | -0.38* (0.22) | 0.23 (0.18) | -0.29* (0.17) | -0.60*** (0.15) | -0.40*** (0.20) | -0.52*** (0.12) |
| N | 546 | 546 | 369 | 546 | 546 | 546 | 751 | 754 | 754 |
| Pseudo $R^2$ | 0.82 | 0.81 | 0.86 | 0.82 | 0.83 | 0.83 | 0.82 | 0.84 | 0.85 |

*Note*: The robust standard errors are reported in parenthesis. ***, **, * denote significance at 1%, 5% and 10% respectively.

The regressions include the following regulatory indices: Reg1: PMR, Reg2: BE, Reg3:BT, Reg4: EBT, Reg5:RAO, Reg6: ABS + BC, Reg7:TOB, Reg8:CSRP+ABS, Reg9: Regulatory quality (from governance indicators)+SSAB.

**Table A2.5 Regression results, probit, financial services**

| Panel A, Base line | | | Panel B, regulatory indices | | |
|---|---|---|---|---|---|
| *Variable* | *Reporter fixed effects* | *Partner fixed effect* | *Variable* | *Reporter fixed effects* | *Partner fixed effects* |
| Ln GDP | 0.54*** (0.03) | 0.61*** (0.03) | Overall activity restrictions | -0.18*** (0.07) | -0.21*** (0.06) |
| Ln distance | -0.43*** (0.05) | -0.71*** (0.07) | Entry into banking requirements | 0.51** (0.17) | |
| Common language | 2.09*** (0.38) | 1.49*** (0.35) | Official supervisory power | 0.13*** (0.05) | |
| Common border | 0.75*** (0.20) | 0.54** (0.21) | Supervisory forbearance discretion | 0.21** (0.11) | 0.26*** (0.07) |
| Both EU | 0.55*** (0.12) | 0.27** (0.12) | Certified audit required | 1.14*** (0.46) | 1.12*** (0.45) |
| Regulatory quality | 1.25*** (0.34) | 2.76*** (0.29) | Accounting standards (information required) | 1.11*** (0.23) | 0.56*** (0.18) |
| | | | Strength of external audit | 0.40*** (0.15) | 0.58*** (0.13) |
| | | | Financial statement transparency | 0.61*** (0.16) | 0.27** (0.13) |
| | | | External rating and credit monitoring | | -0.28** (0.14) |
| | | | External governance | 0.32*** (0.11) | 0.29*** (0.09) |
| | | | No explicit deposit insurance | | -0.82*** (0.27) |
| N | 1976 | 2105 | | | |
| Pseudo $R^2$ | 0.43 | 0.47 | | | |

*Notes*: Panel A presents all the regression variables included in the regression. The country-specific variables are for the partner in the reporter fixed effect regressions while the country-specific variables are for the reporter country in the partner fixed effects regressions, in both Panel and Panel B. Panel B represents the coefficients for the regulatory variables when added to the base line regressions in Panel A. In both panels the figures in parentheses are standard errors while *** and ** indicates statistical significance at a 1% and 5% level respectively.

**Table A2.6 Regression results, determinants of bilateral trade, financial services (PPML)**

| Panel A, Base line | | | Panel B, regulatory indices | | |
|---|---|---|---|---|---|
| *Variable* | *Reporter fixed effects* | *Partner fixed effect* | *Variable* | *Reporter fixed effects* | *Partner fixed effects* |
| Ln GDP | 0.79*** (0.05) | 0.82*** (0.08) | Overall financial conglomerate restrictions (ln) | | -1.29** (0.67) |
| Ln distance | -0.39*** (0.05) | -0.53*** (0.07) | Entry into banking requirements | -0.02*** (0.005) | |
| Common language | 1.00*** (0.13) | 1.52*** (0.14) | Overall capital stringency | | 0.28*** (0.06) |
| Common border | -0.23 (0.18) | -1.07*** (0.21) | Initial capital stringency | | 0.08*** (0.03) |
| Both EU | 0.69*** (0.18) | 1.16*** (0.22) | Capital regulatory index | | 0.08*** (0.02) |
| Regulatory quality | 1.83*** (0.54) | 5.06*** (0.57) | Supervisory forbearance discretion | | 0.14** (0.07) |
| | | | Independent supervisory authority, banks | | 0.91*** (0.28) |
| | | | Independence of supervisory authority, fixed term | | -0.80*** (0.29 |
| | | | Accounting standards (information required) | 0.19*** (0.07) | 0.73*** (0.16) |
| | | | Strength of external audit | | -0.59*** (0.14) |
| | | | Financial statement transparency | 0.16*** (0.06) | 0.94*** (0.17) |
| | | | No explicit deposit insurance | -1.23*** (0.06) | -2.05*** (0.49) |
| N | 2109 | 2144 | | | |
| Pseudo $R^2$ | 0.84 | 0.78 | | | |

*Notes*: Panel A presents all the regression variables included in the regression. The country-specific variables are for the partner country in the reporter fixed effect regressions while the country-specific variables are for the reporter country in the partner fixed effects regressions, in both Panel and Panel B. Panel B represents the coefficients for the regulatory variables when added to the base line regressions in Panel A. In both panels the figures in parentheses are standard errors while *** and ** indicates statistical significance at a 1% and 5% level respectively.

## ANNEX 3. THE CONSTRUCTION OF POLICY HETEROGENEITY INDICES

This section discusses the key elements of the new policy-heterogeneity indicator developed by Kox and Lejour (2004 and 2005) and the data that have been used to apply it to actual regulation data.

The indicator has to address the multi-dimension problem that is inherently present in comparing different institutional settings. Domestic policies include, *inter alia*, requirements on input use (qualifications), liability and nationality requirements for the firm and its management, permits and licenses, membership of professional organisations, and operational regulations (marketing, professional co-operation, legal form). There are many possible dimensions in which these regulation elements may differ between countries. The designers of these domestic regulations often did not intend to make them barriers for foreign service providers. The latter aspect need not have been a consideration at the time, even though these access-restricting measures in general tend to benefit the incumbent firms in the industries concerned.

### 1. Desired properties of the policy-heterogeneity indicator

The quantitative policy-heterogeneity index is primarily designed for empirical trade studies that intend to assess how much policy differences affect bilateral trade in services, and which policy areas are most crucial in this regard. It means that the indicator should be a decomposable, bilateral quantitative index. Moreover, since we cannot –and do not want– to judge the appropriateness of individual policies in individual countries, the policy-heterogeneity index and its aggregation device should be independent of judgements on specific policy items. The indicator should have the following seven properties:

a) increase in the degree of regulation differences, regarding contents and implementation form;

b) aggregation possible over multiple dimensions with respect to which regulation items may differ;

c) yield a single numerical indicator;

d) specific for each country pair;

e) aggregation independent of a set of subjective weights;

f) independent of judgements on a priori criteria about specific product-market policies in countries, no matter whether these criteria are subjective or based on specified objective;

g) decomposable with respect to specified regulation areas.

### 2. Heterogeneity analysis on the basis of qualitative policy data

The basic principle of the policy-heterogeneity indicator is that multiple-dimension qualitative policy information is reduced to dimensionless binary information. The latter can be aggregated to heterogeneity indicators that satisfy the seven criteria specified in the preceding section.

***Specific for each country pair***

Let there be some regulation attribute *R* for which it can unequivocally be assessed whether or not it applies in a country. This gives logical information: $R \in \{1,0\}$, so that regulation attribute *R* can also be used to compare two countries. For any two countries (*i* and *j*) dissimilarity indicator $h_{ij}^{R}$ has the value of *1* when both countries are dissimilar with respect to *R*, and *0* in the opposite case. The dissimilarity indicator $h_{ij}^{R}$ is specific for each possible country pair. For *n* countries we have:

$$h_{ij}^{R} \in \{1,0\} \quad for \ \forall i, j \subset (1,..,n) \tag{1}$$

From a perspective of informational content, not all dissimilarity indices are interesting. Trivial are the cases of self-similarity ($h_{ii}^{R}, h_{jj}^{R}$) and the cases of bi-directional similarity, i.e. $h_{ij}^{R} \equiv h_{ji}^{R}$. The pair-wise comparisons can be gathered in a *n*×*n* dissimilarity matrix $H^R$. Weeding out the cases of self-similarity (matrix diagonal) and bi-directional similarity (below diagonal) we get a dissimilarity matrix with many blank elements. For a case of four countries (*a,b,c,d*) the dissimilarity matrix for regulation attribute *R* looks like:

$$H^{R} = \begin{bmatrix} h_{aa}^{R} & h_{ba}^{R} & h_{ca}^{R} & h_{da}^{R} \\ h_{ab}^{R} & h_{bb}^{R} & h_{cb}^{R} & h_{db}^{R} \\ h_{ac}^{R} & h_{bc}^{R} & h_{cc}^{R} & h_{dc}^{R} \\ h_{ad}^{R} & h_{bd}^{R} & h_{cd}^{R} & h_{dd}^{R} \end{bmatrix} = \begin{bmatrix} . & h_{ba}^{R} & h_{ca}^{R} & h_{da}^{R} \\ . & . & h_{cb}^{R} & h_{db}^{R} \\ . & . & . & h_{dc}^{R} \\ . & . & . & . \end{bmatrix} \tag{2}$$

The system can easily be expanded from single-attribute indicators to a system dealing with multiple regulation attributes. Suppose countries are compared over a set of $R_s$ (*s=1,2,..,m*) different regulation attributes, resulting in *m* dissimilarity indicators for each country pair. This produces a $n^2 \times m$ dissimilarity matrix $H^{Rs}$. After again weeding out the informational redundancies the matrix in the four-country case reads as:

$$H^{Rs} = \begin{bmatrix} . & h_{ba}^{R1} & h_{ca}^{R1} & h_{da}^{R1} & . & h_{ba}^{R2} & h_{ca}^{R2} & h_{da}^{R2} & ..... & . & h_{ba}^{Rm} & h_{ca}^{Rm} & h_{da}^{Rm} \\ . & . & h_{cb}^{R1} & h_{db}^{R1} & . & . & h_{cb}^{R2} & h_{db}^{R2} & ..... & . & . & h_{cb}^{Rm} & h_{db}^{Rm} \\ . & . & . & h_{dc}^{R1} & . & . & . & h_{dc}^{R2} & ..... & . & . & . & h_{dc}^{Rm} \\ . & . & . & . & . & . & . & . & ..... & . & . & . & . \end{bmatrix} \tag{3}$$

How large should *m* be? A single policy attribute for which we compare two countries is just a sample for policy heterogeneity. We are not interested in this particular policy item as such. Rather, we consider it as a specimen from which we can derive that the two countries could have structural or pervasive policy

differences in place. With *m* close to unity it is more likely that the policy-difference picture blurred by incidental sampling errors. One then may easily find average heterogeneity values that are either close to zero or close to unity. Using a larger number of observations diminishes the probability of sampling errors with respect to structural policy differences between countries. Structural (dis)similarities in policy are asymptotically approximated by a larger number of regulation attributes. In practical terms, by considering more than -say- hundred different policy attributes, it is very unlikely that we only get an incidental or atypical picture of bilateral policy differences.[41]

***Aggregation possible over multiple dimensions***

Matrix $H^{Rs}$ reduces the dimensions of regulation attributes $R_s$ to *m* dimensionless numbers that can be aggregated in several directions: per country pair, accross countries, across subsets of regulation attributes.

***Yield a single numerical indicator***

Average bilateral regulation heterogeneity per country pair over the *m*-dimension set $R_s$ regulation attributes is:

$$HG_{ij}^{Rs} = \frac{1}{m}\sum_{r}^{m} h_{ij}^{Rs} \qquad \forall\, i, j\,;\, s = 1,...,m \tag{4}$$

The elements of the set $h_{ij}^{Rs}$ are either zero or one, so that: $0 \le HG_{ij}^{Rs} \le 1$. If the indicator is close to unity, both countries have very dissimilar policies.

Matrix $H^{Rs}$ may also be used to identify countries with strongly diverging policies vis-à-vis all other countries. This is measured by the country deviancy indicator. For country *i* it can be defined as:

$$DV_i^{Rs} = \frac{1}{n\,.\,m}\sum_{j}^{n}\sum_{s}^{m} h_{ij}^{Rs} \tag{5}$$

The country deviancy indicator can if necessary be expressed in relative terms by normalising it with the average for all countries. Note that two countries with a low score on the deviancy indicator do not necessarily have similar policies, since the indicator just registers the existence of regulation differences, not the actual content of regulations.

***Decomposable with respect to specified regulation areas***

Finally, matrix $H^{Rs}$ can be used to calculate average heterogeneity across any preferred subset of the $R_s$ regulation vector, or for any sub-set of countries.

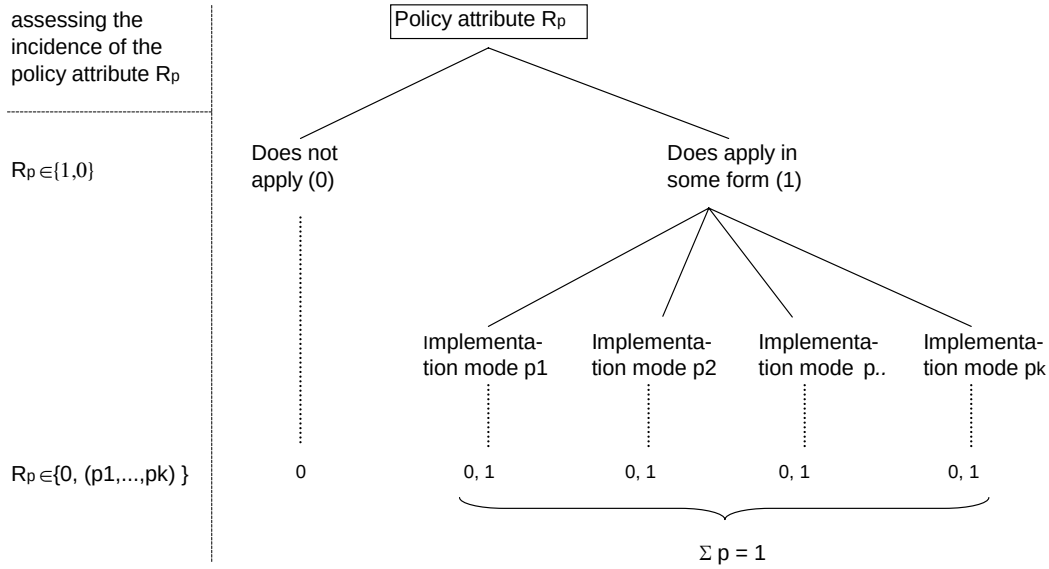
***Increase in the degree of regulation differences***

So far we dealt with *binary* regulation attributes that either apply or do not apply in a country: $R_i \in \{1,0\}$. In principle any regulation could be described in binary terms, but this may either be too unpractical due to the required amount of detailed taxonomic work, or simply because the necessary regulation data are not available for international comparison. Many comparison items are of a more complex nature than simple yes-no questions, meaning that difference between countries can only be described in terms of distinct implementation modes. This can be labelled *categorial* regulation

41 Recently, a comparable method was introduced for describing the similarity structure of biological populations (Zheng, 2005).

information. The actual implementation of a regulation is grouped into a limited number of discrete and mutually exclusive implementation modes. Consider regulation attribute *Rp* that can be implemented in *k* different modes ($p_1,p_2,..,p_k$), so that for any country *i* we may find *k+1* different values for *Rp*: $R_{pi} \in \{0,p_1,p_2,...,p_k\}$ as Figure 1 shows.[42]

**Figure 1. Dealing with categorial regulation attributes (discrete implementation modes)**




The introduction of multiple implementation modes increases the number of possible regulation differences. The likelihood that two countries have different policies in place increases. Assume that countries are independent and that the presence of a certain regulation attribute in one country has no impact on its presence in the other county (random draw). For any country *i* we may find *k+1* different policies[43] in place ($0,R_{p1},R_{p2},...R_{pk}$). Hence, for any pair of countries *2(k+1)* different regulation combinations are possible. The probability of each combination is $[2(k+1)]^{-1}$. Since there are *k+1* different policies, the probability that we find identical policies in both countries is: $(k+1)^{-1}$. The probability that we find different (heterogeneous) policies is:

$$\Pr\left(h_{ij}^{Rp}=1\right)=\frac{k}{k+1} \qquad (6)$$

The heterogeneity indicator increases in the number of regulation allowed regulation modes *k*. E.g. for *k=1, k=5* and *k=9* the probabilities are *0.5*, *0.8* and *0.9*.

Multiple implementation modes magnify the dissimilarity matrix $H^{Rs}$ to dimensions $n^2 \times m \times g$, where *g* is the maximum number of implementation modes that holds for any of the regulation attributes. Regulation attributes for which it holds that $g>k$ will effectively be represented in the matrix by blank

42 The case of binary policy attributes is a special case, with k=1.

43 Including the possibility that a particular country has no regulation in place for this policy item.

elements for the implementation modes $\{k,..,g\}$. In the summary indicators we can correct for the number of blanks in the relevant rows or columns.

After adding the implementation modes as comparison dimensions, the country deviancy indicator becomes:

$$DV_i^{Rps} = \frac{1}{n \,.\, m \,.\, k} \sum_{j}^{n} \sum_{s}^{m} \sum_{p}^{k} h_{ij}^{Rps} \qquad (7)$$

***Aggregation independent of subjective weights***

The heterogeneity indicator $HG_{ij}^{Rs}$ is based on an unweighted average over all relevant regulation attributes. This has the advantage that the composite heterogeneity indicator is not based on subjective information elements. Figure 2 illustrates how the bilateral heterogeneity indicator is calculated and aggregated in an example for two countries, three regulation attributes (R) and maximally four different implementation modes.

***Independent of pre-defined judgements on specific policies***

Heterogeneity and country deviancy indicators are dimensionless numbers. They give no information about the nature of the heterogeneity itself, nor on the question whether a player is high/low, strict/lenient or intensive/extensive with regard to a particular regulation characteristic. The indicator is primarily a frequency count for bilateral policy differences. It can be decomposed for policy differences in specific regulation domains. If one is interested in these aspects, the indicators will have to be used in combination with a dimensioned level indicator.

**Figure 2 Illustration of aggregation procedure for bilateral policy heterogeneity indicator**

| Regulation attribute (R) | Implementation mode (p) | Regulation in Country 1 | Regulation in Country 2 | Hetero-geneity count for item | Cumulative hetero-geneity count | Average bilateral heterogeneity count |
|---|---|---|---|---|---|---|
| License or permit required for operating in service sector ..X.. | a) No requirement<br>b) Always<br>c) Only firms in activity ..Y..<br>d) Only firms larger than ..Z.. | No requi-rement | Only firms in activity .Y. | 1 | 1 | 1 |
| Nationality requirements for management of companies operating in service sector ..Q.. | a) Yes<br>b) No | No | No | 0 | 1 | 0.5 |
| Existence of restrictions (other than capital and technical) for participation in public tendering for service contracts | a) No restric-tions<br>b) Always<br>c) Often<br>d) Sometimes | Some-times | Always | 1 | 2 | 0.67 |

***Empirical implementation***

The OECD International Regulation database collects data on regulation attribute $R_i$ and regulation implementation modes $R_{pi}$ (where *i* represents each of the OECD member states). The CPB heterogeneity indicator uses these data to derive the presence of bilateral policy differences, without specifying in which dimensions these bilateral differences occur. The indicator may also be used on other regulation forms of uncensored (non-processed) data about policy differences between countries. The CPB policy-heterogeneity indicator can be decomposed for policy differences in specific regulation domains.

Summing up. the regulatory heterogeneity indicator meets all seven properties that we expect such an indicator to comply with. It increases in the degree of policy differences between countries. It does not apply any implicit or explicit judgement on domestic policies, neither during initial policy assessments per country nor during the aggregation of the indicator over different regulation attributes. The indicator provides comprehensive information about bilateral policy dissimilarity.

***Relation between policy heterogeneity and policy intensity: two caveats***

In the empirical interpretation of the CPB policy heterogeneity indicator we may need to correct for the policy intensity level in a country. Suppose we consider two pairs of countries. In the first pair, both countries are highly regulated, while in the second pair, both countries have liberalised markets. The observed level of heterogeneity for the first pair is likely to be higher than in the second country pair for the simple reason that with more regulations in place, it is more likely that there will be many regulation differences.[44] So, the observed level of heterogeneity may to some extent be a function of the regulation intensity in countries. This is an element that will have to be controlled for in empirical applications.

A related caveat concerns the symmetry assumption (bi-directional similarity) in the heterogeneity concept. The indicator gives no information about the nature of the heterogeneity itself, nor on the question whether a country is high/low, strict/lenient or intensive/extensive with regard to a particular regulation characteristic. Arguably, firms from a highly-regulated country that export to a liberalised country will experience less policy-heterogeneity costs than firms that operate in the reverse direction. Hence, asymmetric costs may occur due to a relation between the regulation intensity and regulation heterogeneity. So, also for this reason, empirical applications of the CPB policy-heterogeneity indicator need to control for the level or intensity of product-market regulation.

By choosing the proper policy areas the heterogeneity indicator can be used as a proxy for policy-related market-entry costs for exporting firms. The OECD summary indicators for the intensity level of product-market regulation (PMR) are only related to the CPB policy-heterogeneity indicator in the sense that both indicators are based on the same policy database.

44 Assuming that the number of policy implementation modes (k) is larger than one.