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The free movement of services within the EU

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Abstract in English

Intra-European trade in services is hampered by national regulatory differences for service markets. The European Commission has proposed a new directive to overcome these regulatory barriers. This document assesses the effects of this new directive on trade and investment in services. We have developed an index for bilateral heterogeneity in product-market regulation, and apply it to the OECD Regulation Database. We show that the heterogeneity in regulation hampers bilateral service trade in the EU, and also bilateral direct investment. We investigate how the proposed EU directive could lower the intra-EU heterogeneity in product market regulation for services, and what effect this would have on bilateral trade and investment in the Internal Market for services. We find that commercial services trade in the EU might increase by 30-60%, while the foreign direct investment stock in services might rise by 20-35%.

Key words: EU internal market, service trade, direct investment, regulatory barriers in services, gravity model

Abstract in Dutch

De intra-Europese handel in diensten wordt gehinderd door nationale verschillen in de intensiteit van marktregulering en de daaruit voortvloeiende kosten voor exporteurs en directe investeerders. De Europese Commissie heeft een nieuwe richtlijn voorgesteld om zulke handelsbarrières te beperken en/of te elimineren. Dit onderzoek evalueert de effecten van de nieuwe richtlijn op de handel en investeringen in diensten. Daartoe hebben we een indicator ontwikkeld voor de intra-EU heterogeniteit in marktregulering voor diensten, en deze toegepast op de data van de OECD Reguleringsdatabase. Het blijkt dat de heterogeniteit in regulering de bilaterale handel en in diensten en de bilaterale directe investeringen in de Europese Unie hindert. We hebben onderzocht hoe de voorgestelde EU richtlijn de reguleringsintensiteit en daarmee de bilaterale handels- en investeringspatronen zou kunnen wijzigen. De conclusie is dat door toepassing van de EU richtlijn de handel in commerciële diensten met 30 à 60% kan stijgen en dat de bilaterale directe investeringen in diensten met 20 à 35% kunnen toenemen.

Steekwoorden: interne markt EU, dienstenhandel, buitenlandse directe investeringen, marktregulering, graviteitsmodel

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Preface

At the Lisbon summit the European government leaders declared that the European Union should become the most competitive economy in the world by 2010. Though many people nowadays cast doubts over the feasibility of this target, few of them doubt that important structural reforms will be required to get even close to the target. One of these reforms could be the functioning of the internal market in services. Since the 1988 Cecchini report much progress has been made towards creating a single European market for goods. The single market for services is, however, still in its infancy. In most service sectors, less than 5 per cent of production is exported to other EU member states. Research commissioned by the European Commission Service established that this is at least partly caused by trade costs resulting from a multitude of regulatory barriers in the member states.

   The European Commission recently proposed a directive with wide-ranging proposals to give a boost to the intra-EU market for services. One of its corner stones is the application of mutual recognition of national regulations for service markets. The present CPB Document assesses quantitatively the impact of these proposals on bilateral trade and direct investment in services. Using a new approach for analysing the effects of policy heterogeneity on trade and direct investment, the results show that the new proposals could have a substantial positive impact on intra-EU trade and direct investment in services.

   The report is written by Henk Kox and Arjan Lejour, with support by Raymond Montizaan during his 3-month assignment at CPB. The authors have benefited from comments by Edith Bense (EZ), Marcel Canoy, Coen Damen (EZ), Casper van Ewijk, George Gelauff, Marc Pomp, Stephan Raes (EZ), Paul Tang, and Caroline Wooning (EZ). Thanks go to Ali Aouragh for his assistance with the data. They also thank Giuseppe Nicoletti and Paul Conway of the OECD for making the OECD Regulation data electronically available.

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Summary

In March 2004, the European Commission proposed a directive on the internal market in services. Its aim is to boost the EU's internal market in services by reducing regulation-based impediments to trade and investment in services. The present CPB study investigates how cross-border trade and foreign direct investment in commercial services will change if the EU directive would be fully implemented. We conclude in the report that bilateral trade in commercial services may increase by 30-60 per cent, or when we express it as an increase of total intra-EU trade (i.e. including trade in goods) by 2 to 5 per cent. For foreign direct investment in commercial services the EU proposal may lead to an increase by 20% to 35%.

A cornerstone of the European Union (EU) is the principle that goods, services, capital and labour can move freely between the member states. The internal market for goods functions rather well, after the implementation of the Single Market programme in 1988. This is however not the case for the internal market in services. Service providers often experience obstacles when they want to export their services to other EU member states, or when they want to start a subsidiary company in other EU member states. To an important degree, such trade barriers result from national regulations for service firms or service products. This affects service firms more than manufacturing firms, because the service provider often has to provide his services close to the foreign consumer. Foreign service providers often are confronted by national regulations such as requirements for additional professional qualification, local residence of management, additional professional insurance, and constraints on the use of inputs from their origin country. Sometimes regulation procedures and their application are not transparent, thus creating uncertainty for foreign service providers. The heterogeneity of national regulations increases trade costs and investment costs for service providers doing business in other EU member states. Policy heterogeneity acts as a trade barrier. A characteristic of country-specific regulations is that they cause additional fixed costs that often are independent of firm size. This implies that in relative terms the strongest effect of policy heterogeneity falls upon small- and medium-size service firms.

Even if EU member states have different preferences for the level of regulation of service industries, they might still adopt a common architecture in regulation, and make more use of mutual recognition of national regulation in services. It is in this sense that the European Commission has introduced a potentially very strong proposal. A key element of the recent EC proposals is the 'country of origin' principle. A service has to meet the standards set by regulation of the country of origin, but may no longer be confronted by additional regulation in the EU country where the service is delivered. Moreover the establishment of foreign subsidiaries has to be facilitated by introducing a single point of contact in a country. This will be the place where the foreign service providers can fulfil all their administrative and regulatory

obligations. Another aim of the directive is to eliminate unnecessary and discriminatory regulation such as nationality and residence restrictions. The proposed directive has a "horizontal" approach: it applies the same principles to a large part of the EU services sector, ranging from retail distribution to marketing research, from administration firms to certified accountants, from construction to engineering consultants.

Our report examines whether the proposed EU directive really stimulates cross-border trade and intra-EU direct investment in services. The answer to that question is crucial, because the directive also involves real costs, for instance for making comprehensive adaptations in national regulations. Moreover some organisations fear a loss in consumer protection. Labour unions fear unfair competition on the labour market when foreign service workers operate at the domestic market under less stringent employment conditions than those apply to the workers of domestic firms. The new EU proposals will only be acceptable if real economic benefits are to be expected.

For our analysis we build upon recent empirical OECD work on the relations between national regulation intensity and trade patterns. We use the OECD International Regulation database with its detailed information on national product market regulation. Because we focus on the intra-EU differences in regulation we construct a bilateral indicator of heterogeneity in regulation for five sub-domains of policy regulation. For each EU country pair we apply a pair-wise comparison of national product market regulation using some two hundred different regulatory items. The differences between each country pair are translated in a measure of heterogeneity per sub-domain. Based on this procedure we derive for each EU country pair a heterogeneity index for regulation on *barriers to competition*, *administrative barriers for start ups*, *regulation and administrative opacity*, *explicit barriers to trade and investment*, and *state control*. These bilateral indicators prove useful in explaining the present bilateral trade and investment patterns in the EU.

We explain bilateral commercial services trade between EU member states using a gravity model that uses as explanatory variables: the distance and differences in languages between countries, GDP in the country of origin and destination, and regulatory barriers. Our results show that a high level of policy heterogeneity between two countries has a significant negative effect on bilateral trade and direct investment. The results prove to be robust for various specifications and regression methods. The quantitative results are used for investigating the possible effects of the new EU proposals.

For explaining bilateral direct investment stocks we have adapted the gravity model with several elements of the knowledge-capital model developed by Markusen. The latter model is becoming the standard explanation for direct investment decisions by multinational enterprises. It allows for an integrated treatment of trade and direct investment decisions in international

services markets. Also here we find that the policy heterogeneity indicator negatively affects FDI between the EU member states.

Less heterogeneity in regulation and less regulation in the destination country - as is the aim of the EU directive - thus may stimulate trade in services according to our evaluation. Regulation in product markets stretches out over many issues. Many but not all regulatory issues incorporated in the OECD regulatory indicators are covered by the EU directive. We perform a detailed study of the concordance between the EU directive and the OECD regulation items. If the directive is fully implemented, then much heterogeneity in regulation will disappear. We face however some uncertainty about the impact of the EU directive on the heterogeneity in regulation. For that reason we have developed three variants for the post-directive heterogeneity of regulation in the EU, a minimum variant, a central variant and a maximum variant. The three variants reflect both the statistical uncertainties about the regression analysis and the uncertainties about the implementation of the EU proposals on the heterogeneity in regulation.

We estimate that intra-EU trade for commercial services could increase by 30% to 60% on average. For countries that face relatively much heterogeneity in regulation with their partner countries, the impact on exports and imports could be somewhat larger. For countries that face less heterogeneity in regulation with their main trading partners, the expected effects are smaller. We subsequently calculated the effects on intra-EU FDI stocks. The average increase in bilateral direct investment stocks will be in the range between 20 and 35%, mainly caused by less heterogeneity in barriers to competition and less FDI restrictions.

1   Introduction

In 2004 the European Commission launched a Proposal for a Directive of the European Parliament and of the Council on Services in the Internal Market (EC 2004). It contains wide-ranging proposals that should boost the EU's Internal Market in Services by reducing regulation-based impediments to trade and investment in the service market. The proposed directive has potentially strong implications, because of its "horizontal" approach: it applies the same principles to a large part of the EU service sector. We assess quantitatively what the impacts of these EU proposals could be on intra-EU service trade and direct investment in services.

A cornerstone of the European Union (EU) is the principle that goods, services, capital and labour can move freely between the member states. The internal market for goods seems to function well, after the implementation of the Single Market programme in 1988. That is however not the case for the internal market in services. Service providers often experience obstacles if they want to export their services to other EU member states, or when they want to start a subsidiary company in other EU member states. The EC (2002) has concluded that these impediments are to a considerable degree caused by national regulations for service exporters, foreign investors in services, and for the service product itself. Such regulations are mostly made for domestic purposes without much regard for the interests of foreign service providers.

The EC has recently proposed a directive to reduce the impediments for trade in commercial services.[1] A key element of this directive is the 'country of origin' principle. A service provider who complied with the national regulation of the country of origin should no longer −save for a few explicitly named derogatory issues− be hampered by regulation in the destination country. The establishment of foreign subsidiaries by service firms has to be facilitated by introducing a single point of contact in each member state, i.e. a single "desk" where the foreign service providers can fulfil all their administrative and regulatory obligations. A further aim of the directive is the elimination of unnecessary and discriminatory regulation such as nationality and residence restrictions. The proposed EU directive takes a "horizontal" approach. The same principles apply to a wide range of different EU service sectors, ranging from retail trade to business services, from courier services to construction, from tourism services to commercial medical services. The EU directive is intended to become effective from 2010 onwards. It may have a large impact on the European service economy. The proposed measures could boost bilateral service trade between EU member states and also the intra-EU direct investment in the service sector.

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[1] See EC (2004). The proposals were preceded by a report that took stock of the intra-European regulation barriers for trade and investment in service markets (EC 2002).

The proposals fit in the so-called Lisbon strategy, according to which the EU economy by 2010 should be the most competitive in the world. This is hardly possible if the service sector, representing some 70 per cent of the European economy, remains hampered by national regulatory differences. In most service sectors, still less than 5 per cent of production is exported to other EU member states.[2] In a study commissioned by the European Commission, O'Mahony and Van Ark (2003) conclude that the widening gap between the EU and the US in economic growth per capita is to an important extent caused by the fact that the USA succeeds better than the EU in raising the productivity of service industries. It might be very difficult, probably, to strengthen the competitiveness and efficiency of European service industries without alleviating the effects of national regulatory barriers to the cross-border provision of services. The now proposed EU directive is regarded by the European Commission as a major element in the 'Lisbon strategy'.

The Commission's proposal will be an important topic for the EU Council of Ministers and the European Parliament from the second half of 2004 onwards. One of the questions is whether this proposed directive really stimulates cross-border trade and direct investment in services. The answer to that question is crucial, because the introduction of this directive is no free lunch. Member states will incur costs for making comprehensive adaptations in national regulations and legislation for complying with this EU directive. Further concerns come from consumer organisations fearing for a loss in consumer protection, and from labour unions fearing unfair labour market competition from (temporary) foreign service workers from less-regulated origin countries.

This report will deal with the economic impact of recent EU proposals on trade and direct investment in the Internal Market for services. Our work builds upon recent empirical OECD work on the relations between national regulation intensity and trade patterns. The OECD researchers establish that regulation may affect trade and direct investment.[3] We refine the OECD method of analysis and we concentrate on the EU member states. Instead of only looking at the *level* of regulation we focus on the *heterogeneity* in the forms and contents of national regulations for service markets. We argue that it is fore mostly the heterogeneity in regulation that hampers trade and not the level of regulation as such. The heterogeneity in regulation cause additional transaction and qualification costs when service providers do business in other EU member states. We indeed find strong empirical evidence that regulation

[2] Cf. Kox, Lejour and Montizaan (2004).

[3] In particular, Nicoletti *et al.* (2003b). The OECD researchers conclude that the level of regulation hampers trade in services and foreign direct investment significantly in the OECD countries. They find that a reduction in national regulation levels to that of the least-regulated country (unrelated to the EU directive) – i.e. the United Kingdom– could increase bilateral trade in services by about 20%, while the foreign capital stock could increase by 10% to 20%. They do not discriminate the *level of* and *heterogeneity in* regulation as we do. It could be possible that their result with respect to the level of regulation also picks up some heterogeneity.

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heterogeneity has a negative impact on intra-EU trade and foreign direct investment in service markets.

The main economic implication of the proposed EU directive is that it will substantially reduce regulation heterogeneity, in particular by the 'country of origin' principle, by the 'single point of contact', and by the elimination of discriminatory elements against foreign service providers. After accounting for the uncertainties of the implementation of the EU directive on the regulation heterogeneity and of the heterogeneity indicators on trade and investment, we estimate that commercial service trade could increase by 30 to 60 per cent within the EU, while foreign direct investment stocks in services might increase by 20 to 35 per cent.

Structure of the present report

Chapter 2 describes the barriers in the intra-EU service market and the economic effects of differences in national regulation. The chapter also sketches the contents of new EU proposals for the Internal Market for services. Chapter 3 zooms in on national regulation heterogeneity in the EU. For this aim, we develop a new heterogeneity indicator that is applied to data from the extensive OECD Regulation database. In the chapter we also assess in what areas the new EU proposals might reduce regulation heterogeneity between the member states. In Chapter 4 we introduce the new regulation heterogeneity variable in a gravity model for explaining the bilateral service trade within the EU. The regulation heterogeneity variables appear to contribute significantly to the explanation of bilateral service trade patterns. The estimation results are used to assess the effects of the directive on the size of bilateral service trade. Chapter 5 focuses on the relation between regulation and foreign direct investment in services. Also in this chapter the estimation results are used to assess the impact of the proposed directive on bilateral investment. Chapter 6 presents the conclusions and discusses the trade and investment effects of the directive in a wider welfare context.

2 National regulatory barriers in the EU service market

This chapter outlines the European Commission's motivation for this directive. The free movement of services within the EU is hampered by many regulatory barriers. The Commission has concluded that national service markets are fragmented and not integrated. Section 2.1 gives an overview of the regulatory barriers. Section 2.2 sketches in a general sense how these barriers affect the economic development of EU service markets. Section 2.3 presents the contents of the proposed EU directive, and how it intends to deal with regulatory barriers in the internal market for services. Section 2.4 gives the main conclusions.

2.1 Barriers in intra-EU service market

Service trade is more affected by regulatory barriers than is the case for goods trade. Due to the nature and intangibility of services, many of them require the presence of the provider in the member state where the service is delivered. Whereas with goods only the goods themselves are exported, in the case of service provision it is often the provider himself, his staff, his equipment and material that cross national borders. As a result, some or all of the stages of the business process may take place in the country where the service is provided and be subject to requirements differing from those in the country of origin. At present, regulatory barriers hinder both the temporary movements of service providers to their foreign sales market and the establishment of foreign service subsidiaries.[4] Member States 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 EC undertook a comprehensive stocktaking of many obstacles for the functioning of the internal EU market for services (EU 2002). All stages of the business process are affected: the establishment of firms, the use of inputs, promotional activities, distribution forms of a service, the sales process itself, and the after-sales organisation. We summarise the main types of barriers:

- *Horizontal barriers*, i.e. barriers that are not specific for services, but affect a range of activities, e.g. firm start-up licenses. The involved administrative procedures and decision processes may in itself act as an entry barrier for foreign service providers: authorisation requirements, the length and complexity of the procedures, the opacity of the administrative decision-making and the unclear discretionary powers of local authorities.

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[4] This section draws heavily upon on EC (2002) and a presentation by J. Bergevin of the EC's Directorate-General Internal Market at a CPB seminar of June 10th 2004 (http://www.cpb.nl/nl/activ/workshop/productivity/pdf/Bergevin_workshop.pdf).

- *Additional regulation compliance costs due to not-acknowledging a foreign firm's compliance with regulation in its home country*. EU member states often apply a single regime both to service providers with an establishment on their territory and service firms that provide services from their country of origin. For service exports that are already subject to regulations by national authorities in their origin country, this may result in the duplication of regulatory requirements and its burdens. If foreign service firms from another EU member state send their personnel to the export market on a temporary base for supplying a particular service, they are often fully subject to rules of the social security system of the country where the service is provided. The associated administrative and tax procedures implicitly function as a non-tariff barrier for foreign service providers. Some EU countries require that the owners or managers of firms in particular industries must be resident in their country or must have their nationality. This effectively precludes service provision by exporting foreign firms.

Duplication of regulation compliance costs

* A patent agent who occasionally provides a service in another country is subject to an obligation to obtain authorisation from the latter, to meet the professional qualifications required there, and to enrol in a specific register.
* A landscaping architect who is temporarily providing a service in another country is subject to the obligation to be a member of the national association and to comply with all the professional rules of that country.
Source: EC (2002).

- *Barriers to establishment*. In branches like commercial medical laboratories, some member states require the provider to have no more than a single establishment. The authorisation to operate in a particular service branch sometimes depends on professional (re-)qualification according to the rules of the regulating country. For pharmacies and notary services, several member states impose quantitative geographical limits for establishment. In the distributive branch a newly established firm sometimes has to meet economic tests before being allowed to establish; sometimes incumbent firms have a say in the pre-establishment evaluation.

An example of barriers to establishment

An operator of retail stores established in one Member State and wanting to establish in a number of other Member States might wish to use the services of the real estate agents, shop designers, architects, engineers, construction companies, banks and insurance companies with whom he works in his Member State of origin. In most cases this is impossible because of barriers affecting those
service providers who may not have, say, the authorisations or qualifications required in the other Member States. As a result, the establishment of the retailer may be delayed or rendered more costly and difficult, which in turn affects the services he provides to manufacturers and consumers. In this example the operator not only faces direct barriers for establishment but also restrictions on the use of inputs from other countries, because the producers of the inputs face difficulties in providing services abroad.
Source: EC (2002).

- *Operational restrictions*. Several countries require in particular service sectors that only locally established firms may provide services. EU member states impose restrictions on the allowed legal form of the service provider, restrictions on the use of inputs, or limitations on the variety of services that may be provided by one firm. The market promotion of services is sometimes difficult due to restrictive and detailed rules for commercial communications ranging from outright bans on advertising for certain professions to strict control on content in other cases. Some countries apply fixed or recommended prices for certain services. The large divergence of legislation between member states impedes pan-European promotional activities for many services. With regard to input use by service providers, a variety of restrictions affect, for example, the posting of workers, the use of equipment or material by the service provider or the use of cross-border business services.

Barriers to the use of inputs from origin country:

* Use of business services from home Member State (professions, security services and others)

* Barriers to posting of workers (many service sectors)

* Use of employment agencies or temporary staff (many sectors)

* Restrictions on use of essential plant and equipment related to the provision of the service (construction)

- *Restrictions on the use of foreign services*. Countries sometimes apply regulations that restrict the freedom of consumers to use services from abroad. In some member states there are restrictions on the reimbursement of medical or health services provided in another EU country. In some craft services (e.g. electricians), foreign providers are not entitled to provide maintenance services.
- *Other barriers*. The sale of services across borders may be hindered by differences in contract law. In the after-sales phase a service provider can also face particular difficulties resulting from differences between countries concerning professional liability and insurance or financial guarantees, or problems with repair or maintenance services if they involve the posting of workers across borders. Finally, the intra-EU differences in regulations regarding to the payment and reimbursement of value added tax and other indirect taxes (rates, classification systems and procedures) may function as effective barriers for service providers that operate across national borders. In some professional services and construction, member states require service providers to have a nationally recognised liability insurance or professional indemnity insurance.

The lack of clarity on the regulations themselves and on the way in which they are effectively implemented – e.g. where they are applied on a case-by-case basis by national or local authorities– cause legal and economic uncertainty for foreign service providers.[5]

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[5] Non-regulatory barriers like cultural and language differences may worsen the effects of the aforementioned barriers.

2.2 The economic effects of intra-EU regulation heterogeneity in services

Service markets have a long history of regulation. Partly, this is due to the externalities that the production of some services may cause for third parties, such as environmental effects of transport, the impact of bank reliability on the overall financial system, or the safety aspects of building design. But there is also a more innate cause for government intervention that may have to do with the very nature of the service product. The production and consumption of the service often cannot be separated in place and time, making it difficult to standardise a service product. The quality of the product is *a priori* uncertain for the consumer – more than in the case for commodities. 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 complex professional and medical services that require the input of specialist knowledge. The buyer of such service products is confronted with a structural information asymmetry as to the quality of the service product, sometimes even after the transaction took place. To counter such structural asymmetries (and their imminent fraud possibilities) government authorities use sometimes strict regulations for certain professional services.

Each authority uses its own system of quality safeguards for domestic consumers and service buyers, also within the European Union. That could perhaps be fine in an autarkic system, but it is certainly a great nuisance in a situation with international trade. Service exporters are confronted with different regulations and requirements in each destination country, and the transaction costs that it creates for export transactions. Barriers result in considerable costs for companies engaging in activities doing business between Member States.

Cost effects that result from regulation heterogeneity

The real trade burden does *not* result from the mere fact that a national service market *is* regulated. Suppose that all EU member states have the same type of 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 fixed costs, it could allow the firm to reap economies of scale by expanding its market into additional EU member states. The picture changes when each EU member state has its own qualification criteria, causing additional fixed costs after entering that particular market.[6] Moreover, due to the fact that these fixed qualification costs are specific for that national market, the costs cannot be spread out over production that is destined for other EU markets. The consequence is that the regulation heterogeneity severely restricts the realisation of economies of scale in complying with regulations within the EU. Figure 2.1

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[6] The underlying model assumes that the exporter sequentially enters other EU markets, after exploiting the local demand potential of each market.

pictures these effects for a service provider who subsequently enters a number of EU export markets.[7] Implicitly, Figure 2.1 shows the cost and efficiency gains that can be attained by a system that allows firms to achieve more economies of scale in dealing with regulation requirements.

Figure 2.1   **Cost effect of regulation heterogeneity within the EU internal market (perspective of exporting firm)**

with qualification heterogeneity − − − with one-off qualification costs
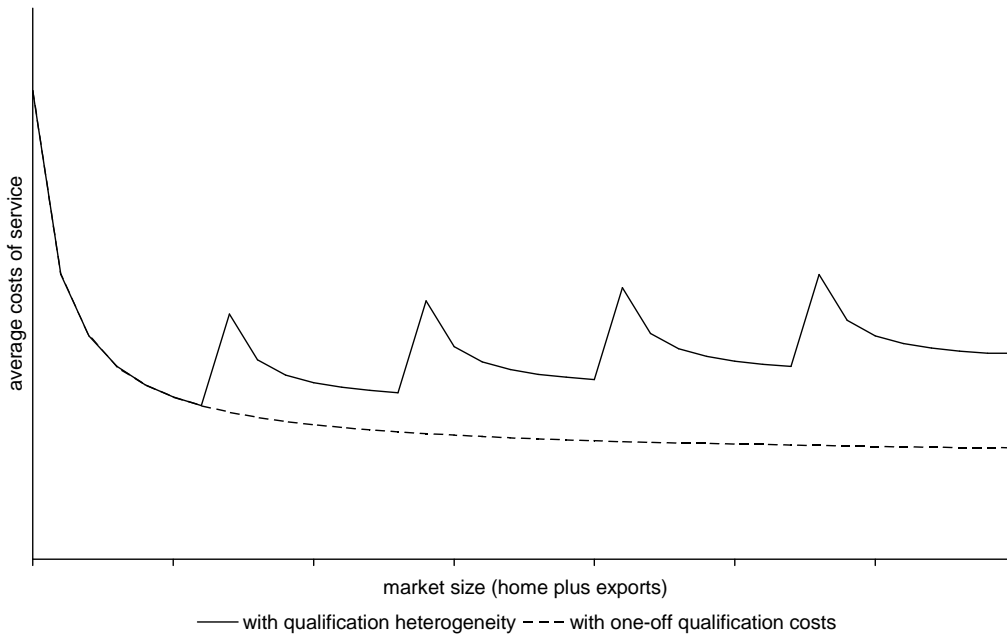
The presence of national qualification requirements gives rise to country-specific fixed transaction costs for the service exporter. Since qualification requirements are fixed and are mostly independent of firm size, the associated costs can be a prohibitive barrier for small and medium-sized enterprises (SMEs) to enter export markets. Note that SMEs form the vast majority of service providers.

If EU countries would share a common structure of service regulation, then it is no longer a problem that some member states have a more stern regulation than other member states. The point with common regulation architecture is that compliance costs made for the more lenient member states are no longer forfeit when entering an export country with tougher regulation (higher regulation intensity). The only thing happening is that some additional compliance costs come on top of it. Figure 2.2 compares the cost effects of a situation of overall regulation heterogeneity with a "2-speed Europe" situation. In the figure, the "2-speed Europe" is characterised by the existence of two groups of member states: a group of countries that shares a more stern regulation regime (member states 3 and 4) and a group of countries (member states 1 and 2) that has the same regulation regime as the provider's home country. The figure shows

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[7] The impact on the establishment of foreign firms (FDI, commercial presence) is more or less similar.

that the '2-speed' EU case still results in much lower average costs of services for an individual service provider than the situation with overall regulation heterogeneity.

Figure 2.2   Comparing overall regulation heterogeneity with a "2-speed Europe" situation
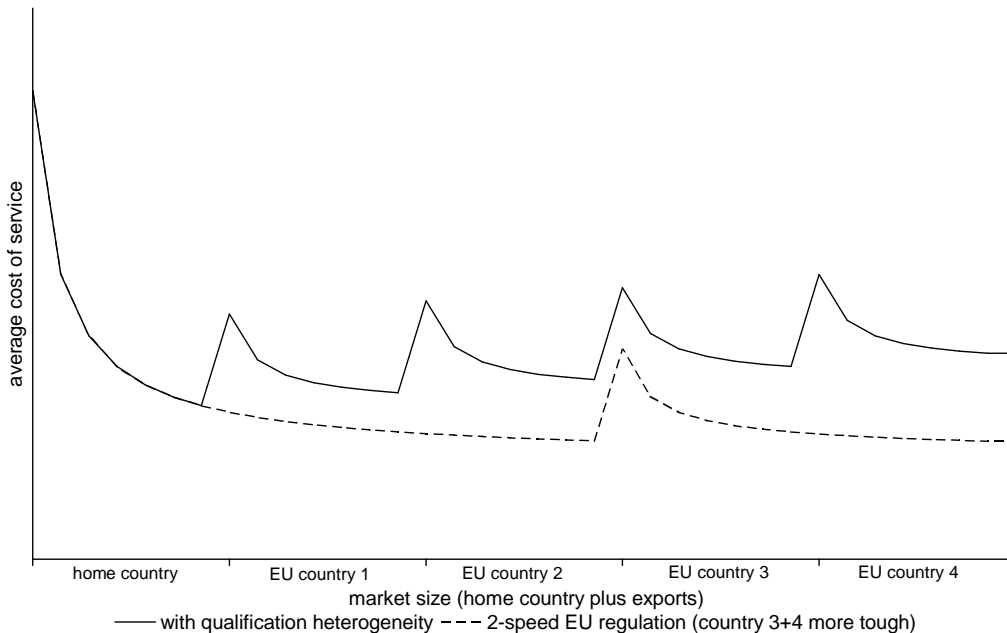
Not only service providers are hampered by the heterogeneity in regulatory regimes. The reverse side of the medal is that the higher level of average costs will also push up the price level of the service, to the detriment of individual consumers and firms purchasing the service. Moreover, it also reduces choice possibilities for consumers because it makes foreign service providers refraining from entering the market. It results in a lower level of foreign competition, and it suppresses the influx of foreign service providers with new products and innovative working methods. The barriers prevent consumers from using foreign services, thus limiting their choice possibilities. This causes an upward pressure on domestic service prices. In the case of producer services, such restrictions lead to higher input prices and less cost-effectiveness. Macro-economically, the heterogeneity of national regulations has a negative impact on welfare: higher consumer prices, and higher costs for intermediate service products, a lower productivity in services, and less product variety for consumers. A comprehensive welfare assessment for the effects of regulatory barriers must take into account all these effects. We emphasize that we do not intend to give a welfare review of the intensity of national regulation in services, but we concentrate on the effects of regulation heterogeneity on trade and foreign direct investment in services.

2.3   The EU directive on services in the internal market

The European Commission wants to undertake a big step to complete the EU Single Market by extending its domain to the service sector. This is the overriding goal of an ambitious and far-reaching directive (EC, 2004).[8] This directive wants to eliminate the obstacles to the freedom of establishment, to eliminate the obstacles to the free movement of services, and to establish mutual trust between the EU countries on their regulatory regimes. The EC proposes several measures for each of these goals, which will be dealt with below.

The proposed directive can be interpreted as a general framework that involves all economic activities regarding service trade, though subject to some exceptions.[9] The proposed measures force the member states to simplify their regulatory procedures, to eliminate regulations that restrict service trade, to guarantee the free movement of services from other member states and to evaluate the proportionality and justification of a number of requirements and the compatibility with EU directives.

Most of these measures should lead to less heterogeneity and a lower level of regulation. At least the lack of transparency and complexity of regulation will be reduced. However, the directive consists also of measures to protect the interests of buyers and users of services such as the system of providing assistance to consumers and the harmonisation of consumer protection. These measures could lead to new regulation and regulatory bodies. These institutes could lay some demands on the service providers with the aim to protect the consumers.

The measures for eliminating the obstacles to the *freedom of establishment* consists of

- Administrative simplification measures. The most important one is to establish per country a 'single point of contact', such that service providers can complete their administrative procedures at one office, and preferably by electronic means. Another simplification measure concerns the use of electronic procedures for fulfilling administrative requirements.
- Certain over-arching principles that must be respected by national authorisation schemes applicable to services. This is in particular directed at the conditions and procedures for granting an authorisation.
- Prohibition of certain restrictive legal requirements (see below).
- The obligation to assess the compatibility of certain national legal requirements with EU directives.

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[8] The directive is still a proposal by the European Commission. It will be discussed by the European Parliament at the end of 2004, and later on by the European Council.

[9] Services sectors covered by the proposed EU directive are: Distribution, Business Services, Hotel and Restaurant servicesConstruction, and Courier Services. Commercial services sectors not covered by the directive are: Financial Services, Transport, Telecommunications, and Energy.

Restrictive legal requirements will be prohibited. This holds for discriminatory requirements directly or indirectly based on nationality or residence. Restrictive requirements such as the prohibitions to establish in more than one member state or to enter the register of professional bodies or associations in more than one member state are also banned. Other restrictions that will be prohibited are the use of economic criteria for establishment or the involvement of competing operators in the granting of authorisation, or the obligation to provide a financial guarantee. Other national requirements have to be evaluated on the compatibility with EU directives. Examples are quantitative or territorial restrictions, obligations of certain legal form of holdings, requirements to the share holding of providers, the number of establishments in one country or the number of employees.

The measures for eliminating the obstacles to the *free movement of services* consist of

- The application of the 'country of origin' principle, such that a provider is only subject to the law of country in which he is established. Other countries may not restrict these services, except for a number of explicitly named exceptions.[10]
- The right of recipients to use services from other Member States without being hindered by restrictive measures or discriminating behaviour from their own government.
- A system for providing assistance to customers (recipients) who use a service that is provided by an operator in another country.
- The allocation of tasks between Member State of origin and of destination in the case of posting workers for provision of services.

The measures *for establishing mutual trust between countries* consist of

- The harmonisation of legislation in order to guarantee equivalent protection of the general interest on essential issues such as consumer protection. This includes provider's obligations on information, professional insurance, settlement of disputes, and exchange of information on the quality of the provider.
- Stronger mutual assistance between national authorities in order to promote effective supervision of services on basis of a clear division of tasks between the Member States.
- The promotion of service quality by voluntary certification of activities or cooperation between chambers of commerce.
- Encouraging codes of conduct drawn up by interested parties at Community level on e.g. particular commercial communications.

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[10] Articles 17-19 of the directive define a number of allowed temporary or permanent exceptions to this general principle.

2.4   Conclusions

The free movement of services within the EU is hampered by many regulatory barriers. These barriers are present at every stage of the business process: from establishment, to the use of foreign inputs, and the promotion, distribution, sales and after-sales of services. Consumers face higher prices because of extra production costs and less variety because less foreign providers enter the market.

It is primarily the heterogeneity of national service regulations, rather than the intensity of national regulations that hampers bilateral trade and investment. Even if member states have different preferences for the level of regulation of services industries, they might still adopt a common architecture in service regulation and make more use of mutual recognition of national service regulation. In this way it may be possible to avoid heterogeneity in regulation that acts as a trade barrier. It is the heterogeneity that raises the (fixed) costs of providers of entering a new market. These costs appear every time they want to enter a new market of an EU member state. The EC proposal seizes upon these barriers.

The EC proposal consists of measures to reduce or eliminate the obstacles of cross-border trade of services by introducing the 'country of origin' principle. It implies that regulation of the country of origin is relevant, and that the country of destination has no right to impose new regulation. The commission has also proposed measures to reduce the obstacles for the establishment of an affiliate abroad by introducing a single point of contact for the service providers to deal with all rules and procedures. Moreover, the EC also introduces mechanisms to build up trust of the member states in each other national regulatory regimes. The EU proposal is only partially aimed at reducing the level of service market regulation in Member States, although local producers might benefit as well from some proposed measures that focus on the elimination of unnecessary and EU-incompatible national regulations.

3 The impact of the proposed EU directive on intra-EU differences in service regulation

This chapter presents the methodology and the data that are used for a quantitative analysis of intra-EU differences in market regulation. We also indicate how and to what extent the EU proposals are expected to affect the heterogeneity and the intensity of market regulation for services. Section 3.1 starts with a description of the OECD data that we use as an input for our analysis. We use these data for deriving a quantitative indicator for bilateral regulation heterogeneity. Section 3.2 briefly sketches the methodology for the regulation heterogeneity indicator. Section 3.3 identifies how the EU proposals will quantitatively affect the main components of intra-EU regulation heterogeneity. Section 3.4 concludes.

3.1 Indicators for regulation differences between EU member states

By its very nature, regulation is a multi-facetted phenomenon that not easily lends itself for a quantitative analysis, let alone in an internationally comparative context. For a quantitative analysis, it is necessary firstly to unravel the main dimensions in which national regulations for product-markets and foreign direct investment may differ. Secondly, we need to identify relevant comparison items, and thirdly, we need a transparent procedure for aggregating regulation differences across countries.

For all these three aspects, we could build on path-breaking work by a team of OECD researchers. They have designed an aggregation method, identified relevant national comparison items, and − even more important− they have set up a public database on national regulation differences. The latter is mainly fed by official inputs from governments of OECD member states. The OECD Regulation database is by far the most detailed and structured dataset on national differences in product-market regulation. It covers many aspects of economic behaviour, seen in particular from the perspective of producers. The first version of the database refers to the benchmark year 1998, and this is the dataset that we will be using presently.[11]

Nicoletti, Scarpetta and Boylaud (2000) present a valuable framework for analysing the level of regulation, and for aggregating detailed indicators into summary indicators for the strictness of regulations. They combine data from the OECD database on product-market regulation with data on economy-wide and industry-specific regulations from other publications. These database entries are mostly coded and ordered (weighted) in a scale ranging from 0 to 6. This allows them to compute detailed indicators for specific regulation areas, measures that increase monotonically with the degree of regulation. Subsequently, they aggregate the detailed indicators into so-called summary indicators. These summary indicators

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[11] About simultaneously with the publication of our report, the OECD will launch an updated version of the regulation database for the reference year 2003. Because the bilateral trade and FDI data used in our analysis refer to the period 1999-2001 the OECD's 1998 regulation dataset is sufficient for our analysis.

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. These indicators are used to assess the regulatory approaches across countries as well as the interrelations between various sets of regulatory provisions. Table 3.1 shows the OECD hierarchy of domains and sub-domains of product-market regulation.

Table 3.1   Product-market regulation: OECD classification of domains and sub-domains

	Main domains	Sub-domains[a]
Inward-oriented policies	State control	* Size and scope of public enterprise sectors * Existence and extent of special right over business enterprises * Use of price controls, legislative control and other command and control regulations in the economy.
	Barriers to entrepreneurship	* Barriers to competition (legal barriers, anti-trust exemptions) * Regulatory and administrative opacity (licensing and permit systems, communication and implementation of rules and procedures) * Administrative burdens on start-ups
Outward-oriented policies	Explicit barriers to trade and investment	* Barriers for foreign share ownership * Discriminating procedures in trade and investment * Trade tariffs
	Other barriers	* Regulatory trade barriers

[a] Annex 2 of this report presents examples of the specific comparison items that fall into the sub-domains.

In a related line of OECD research, Golub (2003) has constructed a dataset for specific regulation that affects the establishment of foreign subsidiaries. The FDI regulation indicator builds upon detailed indicators for: foreign equity restrictions, screening and approval procedures for foreign equity participation, and "other restrictions". The latter category includes nationality or residence requirements for the board of directors and/or management, restrictions on the temporary movement of workers and inputs, and other operational restrictions.[12] Overall, these "Golub" indicators show that FDI restrictions are relatively low in business services, construction, distribution, and hotels and restaurants for 1998 to 2000. These FDI restrictions are somewhat higher than those for manufacturing, but considerably lower than those for network industries like transport, telecommunication, and electricity.

In Table 3.2 we summarise the OECD results with respect to the *level* of the main regulation indicators for EU countries. The table shows that among EU countries there is a fairly large variation in the level of product market regulation and FDI restrictions. Product-market regulation is very low in the United Kingdom, and Ireland. It is relatively high in France, Italy,

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[12] The overall index is based on restrictions for 9 sectors and eleven sub-sectors. Most of them are service sectors.

Greece, Czech Republic, and Poland. For FDI restrictions we see a different pattern. These restrictions are high in Austria, Finland, Portugal, Spain and in the new EU accession countries, while the FDI restrictions are low again in the United Kingdom and Ireland.

Table 3.2	Aggregate OECD indicators for the relative intensity of product-market regulation and FDI restrictions, EU countries, 1998				
Country	Product-market regulation	FDI restrictions	Country	Product-market regulation	FDI restrictions
United Kingdom	0.5	0.064	Portugal	1.7	0.157
Ireland	0.8	0.074	Finland	1.7	0.177
Netherlands	1.4	0.083	Belgium	1.9	0.091
Germany	1.4	0.084	France	2.1	0.111
Denmark	1.4	0.087	Greece	2.2	0.130
Sweden	1.4	0.140	Italy	2.3	0.097
Austria	1.4	0.268	Czech Republic	2.9	0.196
Spain	1.6	0.165	Poland	3.3	0.249
Hungary	1.6	0.173			

Sources: Product-market regulation indices are from Nicoletti et al. (2000), and FDI restriction indices are from Golub (2003).

3.2 A new indicator for regulation heterogeneity

The OECD indicators for each country's relative level of regulation are not sufficient for our purposes. Two countries like for instance Finland and Portugal in Table 3.2 may both have the same regulation intensity (in this case 1.7). However, this identical number at an aggregate level may hide very different actual regulations for service markets. And it is these actual regulations that − at a practical level− cause additional transaction and qualification costs for the individual Portuguese service firm that would like to export to Finland. Since we are looking for a quantitative indicator for these down-to-earth costs at exporter-level, we should focus less on the level of regulation, and more on the heterogeneity of national regulations. For this purpose we refine the OECD analysis and develop an indicator for bilateral heterogeneity in product-market regulation.

Our measure of inter-country policy heterogeneity builds upon detailed pair-wise comparisons between individual EU countries for many specific aspects of product market regulation, both regarding the form and the contents of the regulation. Data for all these comparison items are derived from the OECD regulation database. The heterogeneity indicator − described in more formal detail in Annex 1− measures per comparison item whether two countries have identical regulation or not. When regulation differs we assign a value of *1* to it, and when there is no difference we assign the value of *0*. This yields a numerical indicator for the degree of policy heterogeneity between each pair of individual countries. The comparison is done for 183

detailed aspects of product market regulation.[13] Figure 3.1 presents an example of how we have constructed these indicators.

Figure 3.1   Example of construction of a pair-wise indicator for heterogeneity

Regulation comparison item	Implementation mode	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 b) Always c) Only firms in activity *..Y..* 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 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 b) Always c) Often d) Sometimes	Some-times	Always	1	2	0.67

Subsequently, we calculate an average index of bilateral regulation heterogeneity.[14] Table A1 in Annex 1 presents the numerical results for all pair-wise policy heterogeneity indicators in the EU.

Table 3.3   Detailed indicators of regulation heterogeneity by sub-domain of product-market regulation, based on OECD Regulation database

Components of heterogeneity indicator and covered policy domains [a]	Number of items in the database	Weight as % of total number of items for overall PMR heterogeneity indicator
Regulatory and administrative opacity	13	7.1
Explicit barriers to trade and investment	14	7.7
Other outward barriers[b]	5	2.7
Administrative burdens on start-ups	45	24.6
Barriers to competition	61	33.3
State control	45	24.6
Overall PMR heterogeneity indicator	183	100

[a] Annex 2 of this report presents examples of regulation elements that are covered by the different policy domains.

[b] We will not use this indicator in the analysis. We conjecture that this component is not representative for *other barriers*, because it is only based on five regulatory items.

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[13] How the dataset for the 183 comparison items is composed and derived is described in Annex 1.

[14] After correcting for missing bilateral observations for specific items.

The advantage of using the OECD database is that we can also decompose policy heterogeneity according to the policy area classification system described in table 3.1. On this basis we can decompose the overall heterogeneity indicator for product-market regulation. We thus derive sub-indicators for regulation heterogeneity as reported in table 3.3. We only report the sub-indicators for which we have sufficient detailed comparison items.

3.3 The expected impact of the EU proposals on regulation heterogeneity

Regulation in product markets stretches out over many issues. Not all these issues are covered by the EU directive. We use the full range of 183 comparison items in our subset of the OECD Regulation database for estimating the impact of the EU proposals on intra-EU regulation heterogeneity. At detailed level we assessed the concordance between the OECD regulation item and the aspects covered by the proposed EU directive. We identify per comparison item whether it is:

- Heavily affected by the EU directive, resulting in considerably less (or even complete disappearance of heterogeneity;
- Moderately affected by the EU directive, resulting in less heterogeneity;
- Not affected, so that heterogeneity with such a regulation item persists after full implementation of the EU proposals.

This information has been aggregated into the overall effects of the EU measures on each of the heterogeneity indicators for sub-domains of product-market regulation. If all items for a sub-domain would be fully affected by the EU directive, the expected impact would 100%. If no items are affected, the expected impact is 0%. Because of the uncertain impact of the EU directive on some regulatory comparison items - in particular for those items that are partially affected - we use a bandwidth indicating minimum and maximum effect. Table 3.4 gives the results. It shows that the heterogeneity components *regulatory and administrative opacity* and *explicit barriers to trade and investment* are heavily affected by the EU directive. The heterogeneity components *administrative burdens for start ups* and *barriers to competition* are moderately affected by the EU directive and the component *state control* is hardly affected. The *state control* regulation items mainly relate to network sectors, and the latter are not included in the proposed EU directive. The numbers in table 3.4 will be used to assess the impact of less regulation heterogeneity on trade and direct investment.

Table 3.4 Expected impacts of proposed EU measures on intra-EU policy heterogeneity, by sub-domain

Components of heterogeneity indicator and covered policy domains	Reduction of the components of indicator due to implementation EU directive [a]
Regulatory and administrative opacity	66 – 77 %
Explicit barriers to trade and investment	73 – 78 %
Administrative burdens on start-ups	34 – 46 %
Barriers to competition	29 – 37 %
State control	3 – 6 %
Overall PMR heterogeneity indicator	reduction 31 – 38 %

[a] Based on detailed item-wise consideration of the match between the EU directive and the 183 specific regulation items selected from the OECD database.

3.4   Conclusions

We use the detailed indicators on intra-EU differences in product-market regulation available from the OECD Regulation database. The OECD has developed regulatory indicators on product market regulation, and FDI restrictions, largely based on a detailed survey comprising of hundred of questions on regulation. We also use this database to construct a bilateral indicator of heterogeneity in product-market regulation, for all EU country pairs..

The OECD classification of specific domains in product-market regulation is used for decomposing our heterogeneity indicator in 5 components at a more disaggregate level. The heterogeneity components *regulatory and administrative opacity*, and *explicit barriers to trade and investment* are heavily affected by the EU directive. The components *administrative burdens for start ups* and *barriers to competition* are moderately affected by the EU directive and the component *state control* is hardly affected.

The most relevant parts of the proposed EU directive such as the 'country of origin' principle and a 'single point of contact' can be represented very well in these indicators. In our opinion the first four components are a good representation of the kind of regulatory heterogeneity that the European Commission wants to seize upon. If the proposed directive is fully implemented much heterogeneity in these regulation domains will disappear. On the basis of a detailed concordance analysis between the directive and the items of the OECD regulation database we have assessed the impact of the directive on the heterogeneity in regulation. We will use that later on to determine the impact on service trade and direct investment.

4   Service trade and regulation

This chapter examines the relation between the intensity and heterogeneity of regulation on the volume of service trade within the EU. First, we sketch recent developments in intra-EU service trade. Section 4.2 discusses the gravity model that we use to estimate the determinants of intra-EU service trade and the data. The estimation results in section 4.3 show that the heterogeneity in regulation hampers bilateral service trade. Using these results section 4.4 estimates the quantitative effects of the proposed EU directive on service trade, EU-wide and per member state. Section 4.5 concludes.

4.1   Bilateral service trade in the EU internal market

In spite of the different kind of barriers service trade has developed substantially the last decades in the EU. Intra-EU trade in services has grown by 10.5% annually between 1985 and 2001.[15] It exceeds the growth of intra-EU trade in goods by 1% point in the same period. However the share of services in total intra-EU trade is still only about 20%. That is low compared to the seventy per cent share of services in the total economy. A major reason for the relatively low trade in services is that the nature of services often requires the proximity of providers and consumers. This hampers trade because often providers or consumers have to travel for the service. That is not the case for goods which can be transported independently.

Figure 4.1   Sector shares in services exports for the EU15, 2001

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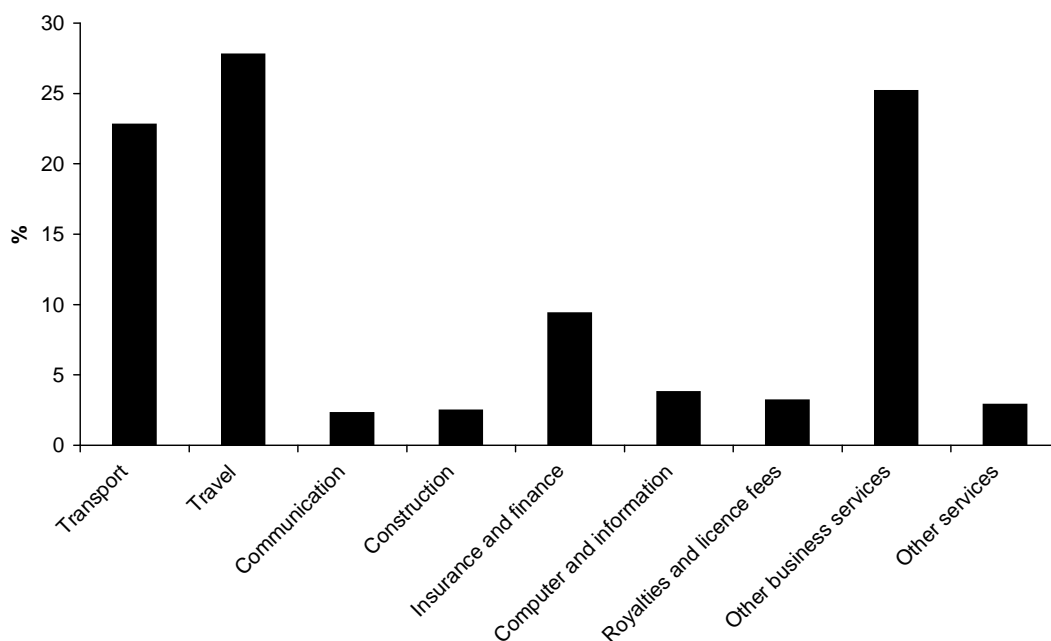
[15] The numbers are derived from our background report: Kox, Lejour, and Montizaan (2004). The latter contains more statistical information on intra-EU service trade and FDI flows.

Intra EU service trade has risen more quickly than inter-EU service trade.[16] Producer services form the most important category in service trade as figure 4.1 shows.[17] The proposed EU directive concentrates on *construction*, *distribution* and *business services*, but it excludes *finance and insurance*, and *transport*. *Business services* and *construction* together represent 37 per cent of total service EU exports, and about half of this is directed to other EU countries (OECD 2003).[18]

Other business services are on average more open to trade than *finance and insurance*, or *personal* and *government services*. Table 4.1 shows the openness (expressed as the value of exports divided by value added) of these sectors for the five largest EU countries and the Netherlands. However the picture is mixed among the EU countries. The Netherlands, the UK and to a smaller extent Spain have a strong trade orientation in *other business services,* whereas this is less the case for France, Germany and Italy.

Table 4.1   Trade openness for various EU countries, 2001.

	France	Germany	Italy	Netherlands	Spain	UK
Transport and communication	20.4	17.7	9.2	70.8	13.1	20.2
Finance and insurance	3.2	7.8	2.2	4.0	6.4	52.6
Other business services	5.8	5.3	7.4	20.8	10.7	15.8
Personal services	3.1	0.4	1.3	4.1	2.4	3.4
Government services	0.5	3.7	0.9	3.2	1.0	5.2

Source: OECD (2003), and own calculations. Openness is defined as value of exports divided by value added times 100.

Table 4.1 also shows that exports in *transport and communication* are relatively high in all EU countries. Only in the UK openness in *finance and insurance* is higher than in *transport and communication*. That reflects the special position of the UK as financial centre. Its trade orientedness is higher than holds for the *financial services* sector in other EU countries.

What do we conclude from this? The numbers show that trade *in business services* is growing above average in the EU. *Business services* are relatively open to trade compared to other sectors like *personal and government services* and *finance and insurance*, but less open than *transport and communication* and manufacturing. The value of exports in *business service*s is considerable. The barriers that providers experience in service trade do not prevent them to trade altogether. However, the EU report (2002) claims that the barriers are substantial. So

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[16] In 2001 intra-EU trade form 56% of total EU trade in services up from 41% in 1985. However, half of the increase is due to a statistical reclassification between 1991 and 1992.

[17] 'Producer services' is a wider category than business services (computer services, equipment rental, contract R&D, accountancy, consultancy, marketing, labour intermediation services, security and cleaning). 'Producer services' also includes banking and insurance, and technology transfer services (royalties and licence fees).

[18] The total value of business services and construction exports amounted to about 235 billion US dollar in 2001. Between 1985 and 2001 trade in business services grew by about 15% each year, which exceeds the average growth in service trade.

reduction of these barriers could stimulate trade by a large amount. An increase in intra-EU trade in services of 10 per cent would imply a value increase by about 12 billion dollar.[19]

4.2   Modelling intra-EU trade in services

We analyse the relation between bilateral service trade and regulation using the gravity equation as developed by Tinbergen (1962) and Linnemann (1966).[20] Reminiscent to the law in physics the model suggest that bilateral trade depends positively on the size of the two countries involved (here measured by GDP) and negatively on the distance between them. The distance is a proxy for trade costs. Many applications of the gravity model also incorporate other factors that represent the specificity of the bilateral relation such as a common language, membership of a free trade agreement, a common border etc.

Originally the gravity model did not have a theoretical underpinning. Helpman and Krugman (1985) and Deardorff (1998) have shown that the models can be derived from a trade model with differentiated goods and that it is consistent with Hecksher-Ohlin theory on international trade, respectively.[21]

The model reads

$$
\begin{aligned}
\ln(TRD_{ij}) = {} & \beta_0 + \beta_1 \ln(GDP_i) + \beta_2 \ln(GDP_j) + \beta_3 \ln(DIS_{ij}) + \beta_4 Lan_{ij} \\
& + \beta_5 PMR_i + \beta_6 PMR_j + \sum_k \beta_{7k} HET_{ijk} + \beta_8 D_{00} + \beta_9 D_{01} + \varepsilon_{ij}
\end{aligned} \tag{4.1}
$$

in which *TRD* represents the bilateral exports between region *i* and *j*. These exports are explained by the basic variables GDP in the exporting region *i*, GDP in the importing region *j*, and the geographical distance (*DIS*) and language distance (*Lan*) between those regions. The other explanatory variables represent the level and heterogeneity in regulation. *PMR* represents the level of product market regulation in the country of origin, *i*, or destination, *j*. *HET* represents the indicator for the heterogeneity in regulation between both EU countries. The suffix *k* represents the five sub-domains in regulation heterogeneity.[22] We include year dummies for the year 2000 (D_{OO}) and 2001 (D_{O1}) to represent the time dimension. In some regressions we also include dummies for the country of origin or destination in order to represents unobserved country characteristics.

Most applications concentrate on total trade between countries. Nicoletti et al. (2003) is one of the first papers that study bilateral trade in services.[23] They also look at the effects of regulation on the size of the service trade flows. We deviate in several ways from their analysis.

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[19] Namely 10% times 50% of 235 billion US dollar.

[20] Nahuis (2004) gives a short overview of the history of gravity models, their theoretical foundations and applications for sectoral trade.

[21] Bergstrand (1989) showed that the gravity model can be consistent with monopolistic competition.

[22] The sub-domains are shown in Table 3.3.

[23] Other studies that focus on bilateral service trade are Grünfeld and Moxnes (2003), Kimura and Lee (2004), and Lejour and Paiva Verheijden (2004).

First of all we concentrate only on the EU countries while they explore a larger dataset of OECD countries. Second, we use other explanatory variables, especially the variables for regulation heterogeneity. Third, our database includes trade data from 1999 to 2001. Finally, we do not analyse total trade in services, but only those service trade categories that are covered by the EU directive. Transport and travel together form about 50 per cent of total service trade, but they are not included in the EU directive.

Data

The bilateral data on services trade are drawn from OECD (2003). These data includes trade in total services and commercial services (excluding transport). Data are available for the years 1999-2001. Only 9 of the 14 EU countries[24] report bilateral trade data. For the other countries the statistics of the reporting countries are used. In this way, we only miss bilateral trade data between the countries Denmark, Greece, Ireland, Spain and Sweden.

For bilateral trade between the other 9 countries we have two reporting sources: the country of origin and destination. Both reporting sources can deviate significantly. Lejour and Paiva-Verheijden (2004) used regression analysis to identify the countries whose reported bilateral trade coincided best with the mirror report by their partner countries. By using the data of the most reliable reporter of the two reporters we have constructed our dataset. Data for 2000 and 2001 are deflated to correct for nominal differences caused by US dollar inflation.

GDP data are from the World Bank (2003a) and distance data from CEPII (Gaulier *et al*. 2003). The language data are based on linguistic differences between languages, derived from the place of the language on the language classification tree (Belot and Ederveen 2004). Data on the regulatory indicators − already described in Chapter 3− are from the OECD (Nicoletti, *et al.* 2000; Golub 2003).

4.3   Estimation results

Our basic specification is the gravity model in which we explain (the log of) bilateral trade in other commercial services (all commercial services except for transportation) by (the log of) GDP in the country of origin, GDP in the country of destination, (the log of) distance and language distance.

The results in Table 4.2 and subsequent tables show that all the estimated coefficients for the typical gravity variables are significant and have the predicted sign. In the OLS estimates, the coefficient for market size in the origin country is higher than for the destination country. The coefficient for distance ranges from −0.71 to −0.82. The language distance indicator is also significant: bigger differences in languages lowers bilateral trade in commercial services.

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[24] Note that data are restricted to the old 15 countries that were EU member in the period 1999-2001, and that data for Belgium and Luxembourg are combined.

Table 4.2   Regression results for bilateral trade in other commercial services, 1999-2001

Dependent variable: Bilateral trade in other commercial services

Estimation method:	OLS [a]	Fixed effects origin	Fixed effects destination
Gravity variables			
Ln GDP Origin	0.83***		0.83***
	(0.03)		(0.03)
Ln GDP Destination	0.67***	0.70***	
	(0.03)	(0.03)	
Ln Distance	− 0.76***	− 0.71***	− 0.82***
	(0.07)	(0.07)	(0.07)
Language distance	− 0.69***	− 0.68***	− 0.64***
	(0.15)	(0.15)	(0.15)
Policy variables			
Product-market regulation Origin	−0.33***		− 0.37***
	(0.07)		(0.07)
Barriers for entrepreneurship Destination	0.08	− 0.08	
	(0.05)	(0.05)	
Heterogeneity, Administrative barriers for start ups	0.07	0.27	0.30
	(0.26)	(0.25)	(0.25)
Heterogeneity, Barriers to competition	−3.67***	− 2.64***	− 3.21***
	(0.37)	(0.39)	(0.40)
Heterogeneity, Regulatory and administrative opacity	− 0.50***	− 0.78***	− 0.40*
	(0.23)	(0.24)	(0.24)
Heterogeneity, State control	− 0.14	− 0.00	− 0.31
	(0.40)	(0.40)	(0.40)
Heterogeneity, Explicit barriers to trade and investment	− 1.31***	− 0.97***	− 0.80***
	(0.23)	(0.25)	(0.25)
Year dummy 2000	0.11	0.04	0.05
	(0.08)	(0.07)	(0.07)
Year dummy 2001	0.22***	0.13**	0.15***
	(0.08)	(0.07)	(0.07)
Constant	− 5.81***	origin country dummies significant	destination country dummies significant
	(0.90)		
Number of observations:	481	481	481
Adjusted R-squared	0.85	0.87	0.87

[a] Absolute value of standard error in brackets.

Codes: *** = coefficient significant at 1% confidence level;   ** = coefficient significant at 5% confidence level; * = coefficient significant at 10% confidence level.

The three specifications in table 4.2 differ by the inclusion of fixed effects for the origin and destination countries.[25] The *level* of product market regulation is relevant for bilateral trade in commercial services. The coefficient for this indicator is negative and statistically significant for the country of origin: stringent regulation in a country hampers the export competitiveness of its service providers.

We focus on the five indicators on *bilateral heterogeneity* in regulation. Three of them are statistically significant at the 1% level, and they have the expected negative sign: *Barriers to competition*, *Explicit barriers to trade and investment,* and *Regulatory and administrative opacity*. The two other policy heterogeneity areas, namely *State control* and *Administrative barriers for start-up firms* appear not to have a significant impact on bilateral trade.

It may be that the heterogeneity variables pick up other non-policy differences between trading partner countries. To reduce this possibility we include fixed-effect dummies for all countries. We did this separately for all origin and for all destination countries (reported in the two last data columns of Table 4.2. The signs of the heterogeneity parameters remain the same, while the values of the parameter estimates are slightly smaller. This suggest that the heterogeneity indicators also pick up some unobserved heterogeneity of the destination countries. Heterogeneity in *Regulatory and administrative opacity* is affected most by including the fixed effects; the variable is now only significant at the 10% level. Heterogeneity in *Barriers to competition* remains strongly negative.

We have also included year dummies in the specification to incorporate the effect of the various years. The dummy for the year 2001 is statistically significant, the one for the year 2000 not. Separate regressions for the various years do not show many differences in the values of the estimated parameters.[26]

In bilateral equations, and certainly with panel data, one should control for unobserved factors that are specific to each country, each partner, each country-partner pair and each period, as well as for shocks that are common to all countries over time. The problem in our case is that estimating dummies for all these factors is not viable, due to an excessive loss of degrees of freedom.[27]

We solve this by a method that Erkel-Rousse and Mirza (2002) applied for the analysis of bilateral trade. They transform all bilateral variables as deviations from their mean. For a specific origin country *Y* they determine for each regression variable the mean over all country *Y*'s export destination countries. This mean of course differs by origin country. The mean is

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[25] Fixed effects or in this case country-specific dummies represent all country-specific heterogeneity in the specification. This also includes heterogeneity that is not captured by the other country-specific variables (like GDP and PMR) in the first (OLS without fixed effects) specification. The disadvantage is that we can not ascribe this heterogeneity to specific (economic) variables. For analytical reasons it is therefore not attractive to combine country-specific dummies for the origin and destination countries in one specification.

[26] Results are available upon request. Moreover, we have also estimated a panel regression, but that gives similar effects as the ones presented in table 4.2.

[27] In the case of the FDI regressions this would require the introduction of 170 dummy variables, and 165 for services trade.

then subtracted from the actual value of the bilateral variable. The same procedure is done for each destination country *X*, *mutatis mutandis*. We thus get two regression equations for bilateral trade, one from the perspective of the origin countries, and one from the perspective of the destination countries. Annex 3 presents more details of this estimation method.

The advantage of the transformed variables is that the origin-specific unobserved effects are accounted for in the origin equation. At the same time we can add explicit country-dummies to take account of the unobserved effects for the destination countries. Similarly, in the destination equations the destination-specific unobserved effects are accounted for by the transformation, and the origin-specific unobserved effects are evaluated by adding explicit country-dummies.

The equations for the country of origin and destination have been estimated simultaneously by the full-information maximum likelihood (FIML) procedure. For brevity, these results will be adduced as DM/FIML estimates.[28] Like Erkel-Rousse and Mirza (2002), we impose identical coefficients for distance and language in the equations for origin and destination country. We do the same for the bilateral heterogeneity variables.

Table 4.3 shows the DM/TLS results, with and without fixed effects. We discuss the results including fixed country effects. The results in the two last data columns in table 4.3 are comparable to the fixed-effects OLS results in table 4.2, i.e. our results are fairly stable over various specifications: the significant policy variables have similar effects in the two specifications: the regulation *level* in the origin country, and bilateral policy heterogeneity in *Barriers to competition* and *Explicit barriers to trade and investment*. Only the significance of the parameter for policy heterogeneity in *Regulatory and administrative opacity* disappears. The year dummy for 2001 is no longer significant: by subtracting the mean from the observations the characteristics of the year 2001 disappear. Regulatory heterogeneity in the policy areas *Administrative barriers to start ups*, and *State control* has no statistically significant impact on bilateral trade in 'other commercial services' in both specifications.

The results in the last data column of Table 4.3 are our preferred estimates. Controlling for country-pair effects and time-specific effects, they describe which impact policy variables have on service exports to other EU countries. We will use these estimates as the basis to assess the trade impact of the EU Services Directive.

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[28] DM stands for the variable transfomation by taking <u>D</u>eviations from the <u>M</u>ean. FIML represents the estimation method.

Table 4.3   Bilateral trade in commercial services: DM method b)

Dependent variable: bilateral trade in other commercial services
Estimation method: Full Information Maximum Likelihood [a]

	DM origin	DM destination	DM origin + fixed effects	DM destination + fixed effects
Gravity variables				
Ln GDP Origin	0.90***		0.83***	
	(0.03)		(0.04)	
Ln GDP Destination		0.85***		0.88***
		(0.04)		(0.04)
Ln Distance	– 0.73***	– 0.73***	– 0.85***	– 0.85***
	(0.07)	(0.07)	(0.09)	(0.09)
Language distance	– 0.46***	– 0.46***	– 0.71***	– 0.71***
	(0.16)	(0.16)	(0.22)	(0.22)
Policy variables				
Product market regulation, origin	– 0.59***		– 0.34***	
country	(0.07)		(0.09)	
Barriers to entrepreneurship,		– 0.03		– 0.03
destination country		(0.06)		(0.07)
Heterogeneity, administrative barriers	0.43	0.43	0.35	0.35
for start ups	(0.30)	(0.30)	(0.36)	(0.36)
Heterogeneity, barriers for competition	– 1.82***	– 1.82***	– 3.10***	– 3.10***
	(0.46)	(0.46)	(0.55)	(0.55)
Heterogeneity, regulation and	– 0.44*	– 0.44*	– 0.23	– 0.23
administrative opacity	(0.27)	(0.27)	(0.33)	(0.33)
Heterogeneity, state control	0.24	0.24	0.74	0.74
	(0.43)	(0.43)	(0.58)	(0.58)
Heterogeneity, barriers to trade and	–0.09	–0.09	– 0.86***	– 0.86***
investment	(0.22)	(0.22)	(0.30)	(0.30)
Year dummy 2000	0.001	0.001	0.01	0.01
	(0.07)	(0.07)	(0.10)	(0.10)
Year dummy 2001	0.00	0.00	– 0.01	– 0.01
	(0.07)	(0.07)	(0.10)	(0.10)
Constant	0.10**	0.10	dummies for	dummies for
	(0.05)	(0.06)	destination	origin
			significant	significant
Number of observations	481	481	481	481
Adjusted R-squared	0.80	0.61	0.70	0.61
Used for policy analysis?	No	No	No	Yes

[a] Full Information Maximum Likelihood (FIML), applying simultaneous estimation of equations for origin and destination countries.

b) All bilateral variables are transformed as deviations from their individual country-wise mean (DM). Cf. main text

Codes: *** = significant at 1% level; ** = significant at 5% level; * = significant at 10% level. Absolute value of standard error in brackets.

4.4   Impacts of proposed EU directive on trade

The aim of the EU directive is to reduce the heterogeneity in regulation for providers who want to export services or want to set up an affiliate company abroad. The heterogeneity in regulation is a burden for exporting and investing. The preceding section has showed that bilateral export of commercial services (excluding transport) is seriously hampered by the regulatory heterogeneity. Here we ask the question to what extent the proposed directive will increase service trade.

Based on equation (4.1) and the estimated parameters of the heterogeneity indicators in table 4.3 we can assess the effects of a change in heterogeneity on the level of bilateral exports. We use the results of the DM/FIML method with fixed effects for the country of origin as our starting point, because that method takes as much as possible unobserved heterogeneity of the countries into account. For every bilateral relation we estimate the expected change in exports. This differs for each bilateral relation, because the heterogeneity in regulation and the change induced by the EU directive varies for each country pair.[29]

In our simulation we account for two types of uncertainty: the statistical uncertainty of the parameter estimates, and some uncertainties about the eventual effects of the Services Directive on the actual policy heterogeneity. With respect to the latter we use the bandwidth on the expected impact of the EU directive on the heterogeneity indicators presented in table 3.4. The statistical uncertainty in parameters is taken into account by using a spread of the estimated parameter plus and minus its standard error. On this basis we discern a bandwidth in the possible effects: a minimum, a central, and a maximum effect. The central effect is calculated by using the parameter estimates and the middle of the bandwidth on the expected impact of the directive on regulatory heterogeneity. The minimum (maximum) effect is estimated using the values of the parameter estimates minus (plus) a standard error and taking the minimum (maximum) value of the bandwidth in table 3.4. Table 4.4 presents the results for the EU and its decomposition.

The effects vary between 30 and 62 per cent. This is a fairly wide range. Both the uncertainty in the impact of the directive on regulation heterogeneity and the uncertainty in parameter estimates contribute substantially to this range. Diminished heterogeneity in the policy area *Barriers to competition* accounts for most of the effects.

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[29] Note that exports are estimated in logs. So the new export level equals the old export level (2001) times the exponent of the product of the change in heterogeneity and the estimated coefficient.

Table 4.4 Impact of EU directive on intra-EU commercial service trade (% change based on 2001 data)

Effects	Minimum	Central	Maximum
Total effect on intra EU trade	30	44	62
Due to less heterogeneity in *Barriers to competition*	25	36	51
Due to less heterogeneity in *Explicit barriers to trade and investment*	5	8	11
Plus effect of less heterogeneity in other regulatory indicators[a]		1	

Source: own estimates based on the results in table 3.4 and 4.3.

[a] This refers to the other policy variables reported in Table 4.3 (last column): heterogeneity in *Regulatory and administrative opacity*, *Administrative barriers to start-ups*, and *State control*, and the level of regulation with respect to *Barriers to entrepreneurship* (for the destination country).

The impact on trade changes just slightly if we also take account of the impact on heterogeneity in *Regulatory and administrative opacity*, *Administrative barriers for start-ups, State control*, and a lower level of regulation on *Barriers to entrepreneurship* in the destination country. Although table 4.3 shows that these estimates are not statistically significant, the impact of the policy variables might be economically significant. Since some of these variables have opposite signs (cf. Table 4.3, last column), the trade-effects more or less compensate each other, so that their combined effect on bilateral trade is negligible.

Country-specific effects

For the country-wise effects we concentrate on the central variant.[30] Table 4.5 presents both the relative and the absolute increase in service trade, taking the bilateral service trade pattern of 2001 as a reference: the table only accounts for the expected changes that occur due to reduced regulation heterogeneity.

Looking at the export effects of the proposed EU measures we find considerable differences between EU member states (see table 4.5):

- Greece and Portugal could expect at least a 70% increase of intra-EU service exports;
- Four countries may gain between 50 and 60 per cent (Austria, Italy and Spain, and Denmark);
- Five countries, among which the largest EU countries, may gain between 40 and 50 per cent on intra-EU services exports: Germany, the UK, France, Sweden, Finland, Ireland;
- Belgium-Luxemburg and the Netherlands are expected to increase trade by 30 to 40 per cent.

Likewise, Table 4.5 presents the simulated changes in imports. All EU member states will see their service exports and their service imports grow as a result of the measures. The EU service markets will become more open, so that intra-EU price and cost differences become more important, giving rise to further reallocations.

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[30] Based on the estimated coefficients and average heterogeneity-reduction effects.

Table 4.5   **Expected absolute and relative increases in commercial services trade due to EU directive for individual member states, central-effect variant, reference year 2001**

	Absolute increase in billion US$		Relative increase in %	
	Exports [a)	Imports[a)	Exports	Imports
Greece	0.5	1.2	72	68
Portugal	0.8	1.2	72	67
Denmark	1.0	1.2	60	58
Austria	2.5	1.4	58	56
Italy	5.3	9.0	53	53
Spain	2.4	2.3	52	45
Germany	10.5	12.2	48	47
Finland	0.7	1.0	47	44
Ireland	2.2	2.5	45	37
Sweden	1.5	1.9	44	41
France	5.3	6.3	42	45
United Kingdom	14.1	6.3	41	41
Belgium-Luxembourg	5.5	5.6	38	37
Netherlands	5.8	6.2	37	37
EU14	58.1	58.1	44	44

[a) The absolute increase in service trade may be slightly underestimated for Spain, France, Denmark, Sweden and Greece, because some data elements on bilateral service trade of these countries were not available for the reference year.

Over time, more effects will result from the increased competitiveness of EU service markets. More reallocation will result from the fact that intra-EU price and cost differences for service products become more important in demand. The same effects may affect non-services sectors in the EU; the inputs of more cost-effective services will also benefit the international competitiveness of the other sectors.

The variation in country-specific results is caused by the fact that – before the introduction of the measures – countries have different trading patterns with different heterogeneity in regulation. A high gain in exports will result when a country has relatively much trade with partners that have rather different *Barriers to competition*. Conversely, if before the measures, a member state trades most with countries that have a more or less similar regulation in *Barriers to competition*, its export gains will be lower. This point is illustrated in Table 4.6 by comparing two differently affected countries. Denmark has a relatively high percentage gain in services exports, while France has a relatively low percentage gain in service exports. It can be seen in Table 4.6 that for Denmark the trade-weighted average policy heterogeneity with respect to *Barriers to competition* with its largest trading partners is about double the level that France has with its trading partners. Denmark trades more than France with partner countries that have a different regulation approach from Denmark's own competition-regulation approach. Due to this initial difference, Denmark will benefit more than France from the proposed EU measures.

With regard to the policy area *Explicit barriers to trade and investment* we see the opposite picture. France differs more from its partners than Denmark. However, this area of policy heterogeneity has less impact on bilateral trade as can be seen in the regression results of table 4.3.

Table 4.6   **Export growth due to the EU measures, and trade-weighted PMR heterogeneity of trading partners: the case of Denmark and France, 2001**

	Denmark			France			
Exports destination	% of exports	heterogen-eity BC [a]	heterogen-eity EBT [b]	Export destination	% of exports	heterogen-eity BC [a]	heterogen-eity EBT [b]
Germany	30.8	0.45	0.10	Belgium-Lux.	24.8	0.17	0.20
UK	17.8	0.38	0.18	UK	21.8	0.27	0.20
Finland	12.9	0.47	0.20	Italy	14.0	0.23	0.25
Subtotal C3 [c]	61.5	0.44	0.14	Subtotal C3 [c]	60.7	0.22	0.21
Netherlands	11.7	0.29	0.00	Netherlands	14.0	0.11	0.22
France	9.8	0.35	0.10	Germany	9.7	0.38	0.11
Italy	8.5	0.48	0.13	Ireland	3.8	0.29	0.20
Belgium-Luxembourg	6.7	0.39	0.18	Sweden	3.3	0.14	0.38
Austria	1.2	0.40	0.20	Portugal	2.7	0.36	0.50
Total C8 [d]	99.5	0.41	0.12	Total C8 [d]	94.1	0.21	0.20

[a] Heterogeneity of partner countries with respect to *Barriers to Competition* (element of product market regulation).
[b] Heterogeneity of partner countries with respect to *Explicit barriers to trade and investment* (element of product market regulation).
[c] Trade-weighted subtotal of 3 most important export destination countries for service exports.
d)Trade-weighted subtotal of 8 most important export destination countries for service exports.

This example explains why the effects of the Services Directive on exports and imports will differ by EU member state. It can be added that the example is a static one with the year 2001 as reference. The country distribution of service exports and imports will however also change due to a more liberalised Internal Market for services. Some reallocation of production and consequently trade patterns might occur.

4.5   Conclusions

Intra-EU trade in services amounts to about 20 per cent of total intra-EU trade. "Other commercial service" includes trade in business services and financial services, and amounts to about 50 per cent of total service trade. Since 1985 service trade has grown on average by about 10% annually, and trade in business services has grown even faster. In spite of these developments service trade is hampered by many regulatory barriers. This chapter has shown that regulation heterogeneity between EU countries hampers bilateral trade in services.

We have used a gravity equation that explains the volume of trade by the distance and differences in languages between countries, GDP in the country of origin and destination, and by regulatory barriers. Various specifications and estimation methods have led to similar conclusions: the heterogeneity of regulation reduces the volume of trade in other commercial services, in particular heterogeneity in barriers to competition. Less heterogeneity in regulation −as is the aim of the EU directive− could thus stimulate trade in services according to our evaluation. We estimate that bilateral trade in the EU might increase by about 30 to 62 per cent. Countries like Denmark, Austria, Greece, Italy, Spain and Portugal may experience even larger-than-average changes in service exports and imports because they face relatively much heterogeneity in regulation with their partner countries. For other countries, such as the Netherlands and Belgium, the relative changes are expected to be somewhat smaller. The overall European market for commercial services will become considerably more open because of the proposed EU Services Directive.

5 The effect of national regulation on intra-EU patterns of direct investment in services

This chapter deals with the effects that reduced policy heterogeneity between Member States may have on bilateral direct investment patterns in the service sector. We use the same method as for cross-border service trade, but add some explanatory variables that are specific for direct investment. We find a strong impact of regulation heterogeneity on bilateral direct investment in the EU. Section 5.1 gives some basic data on the intra-EU direct investment in services. Section 5.2 discusses the theoretical motivation for applying gravity analysis to bilateral direct investment patterns. After a brief discussion of the used data set, section 5.3 presents the gravity analysis itself. The statistical results are subsequently used in section 5.4 for calculating the potential effects of the proposed EU directive. Section 5.5 concludes.

5.1 Intra-EU direct investment in services: present patterns

The preceding chapter dealt exclusively with trans-border service supply through exports: the service products move across the border. However, several studies estimate that a larger share of international service supply is provided by service firms that establish themselves in a foreign market at a global level.[31] The lack of data made it impossible to estimate this for the EU.

As a proxy for the role of foreign service subsidiaries in the EU, figure 5.1 shows the share of majority-owned foreign subsidiaries in total employment of the non-financial commercial services.[32] Even though minority-owned foreign subsidiaries and joint-ventures with foreign firms are not captured in this way, the foreign-owned employment share still ranges between 2 and 17 per cent in the EU. Individual EU member states differ quite strongly in the share that affiliates of foreign service multinationals have in the employment of the domestic service sector. Belgium and Hungary have the highest employment shares, while Germany, Portugal and Italy have the lowest employment share of foreign service multinationals.[33]

The activities by foreign service multinationals tend to be spread quite unevenly over domestic service industries in the EU. This can be illustrated via "FDI inflow intensities", i.e. the share of a sector in total service FDI inflows over that sector's share in total domestic service production.

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[31] See Karsenty (1999) and World Bank (2003) for estimates of the FDI share in worldwide service supply. Kox and Lejour (2004) come to similar results for the Netherlands. In terms of the General Agreement on Trade in Services (WTO/ GATS), international service supply through foreign local presence is labeled as 'Mode III'.

[32] Data are derived from the OECD FATS database, which presents activity data of majority-owned foreign affiliates in specific industries of OECD countries. These data have been compared with data on total employment of domestic firms in the same industry aggregate (using OECD STAN).

[33] Further details can be found in a more descriptive companion paper on the EU services market (Kox, Lejour and Montizaan 2004).

Figure 5.1 **The share of majority-owned foreign affiliates in total employment of the non-financial market services, selected EU countries, 1997-98**
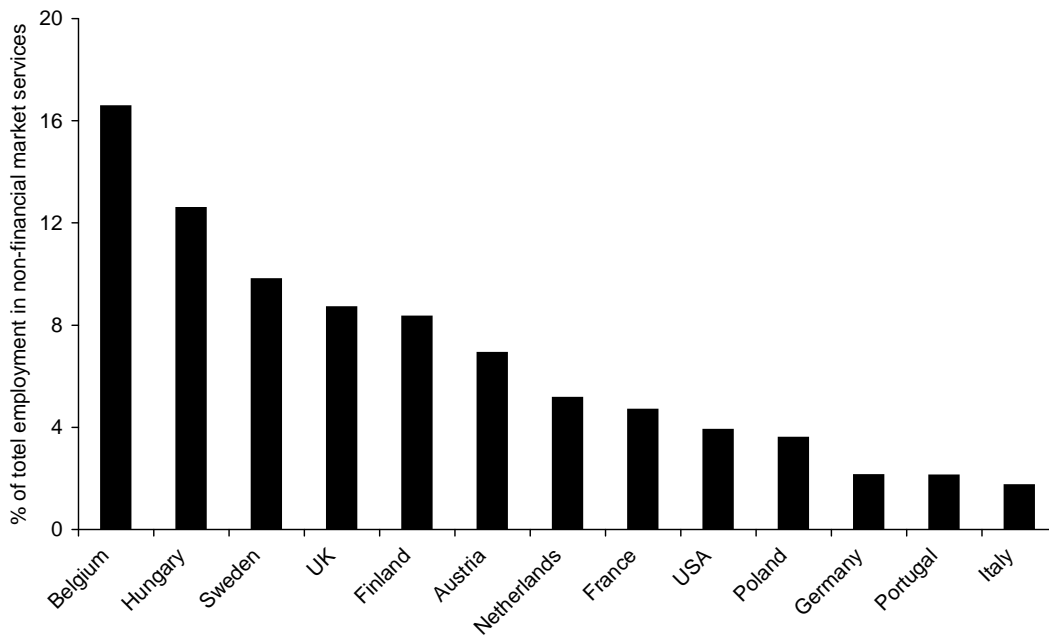
This indicator would be *1* (unity) if a service sector attracts a share of FDI inflows that corresponds with its share in domestic production. However, table 5.1 indicates that service sectors covered by the EU directive on average[34] account for much less FDI inflows than would have corresponded with the share these sectors have in domestic service production. Unlike the USA, all EU countries in the table attract remarkably little FDI in the *trade and distribution services*. The predominantly consumer-oriented *tourism and other services* are underrepresented in FDI flows. In the UK, the Netherlands and Spain *business services and real estate* attracts a relatively low share of direct investment compared to the sector's size; the opposite holds for France and Germany. *Communication* gets relatively strong attention from foreign investors, which may well be due to deregulation that took place in the late 1990s, combined with the auctions for mobile phone licenses. Except in the Netherlands, the banking sector (financial intermediation) attracts more FDI than one would expect on the basis of the sector's relative size. Apart from policy factors this FDI inflow pattern could also be determined by network factors, scale effects and sector-specific transaction costs.

[34] Germany being the exception.

Table 5.1 **FDI inflow intensity: sector share in total service-FDI inflows divided by the sector's share in total domestic service production, selected countries, 1998-2000 [a]**

	Germany	France	UK	Spain [c]	Netherlands	USA [b]
Sectors covered by directive						
Trade, distribution	0.1	– 0.4 [e]	0.5	0.3	0.5	1.3
Business services and real estate	1.9	1.5	0.4	1.9	0.2 [d]	0.4
Tourism and other services	0.0	0.1	0.2	0.1	0.2	1.0
Unweighted average	0.66	0.42	0.35	0.76	0.33	0.90
Sectors not covered by directive						
Communication	1.2	0.8	6.4	4.3	3.0	– 1.3
Transport services	0.0	0.2	0.0	0.1	0.1	0.6
Financial intermediation	1.1	4.5	2.6	0.7	7.9	4.1
Insurance (incl. (auxiliary services)	– 0.1	0.5	1.0	0.0	1.2	3.0
Unweighted average	0.56	1.5	2.51	1.27	3.04	1.59

[a] service sector shares in total domestic service production are for the year 1999, except for Germany (1998).

[b] USA FDI inflow data refer to 1998.

[c] For Spain, production data for Real Estate and Business services, and for Tourism and Other Services refer to 1998, while data on Communication, Financial Intermediation, and Insurance refer to 1997.

[d] This excludes the FDI inflows in financial holding companies.

[e] France had a net FDI outflow (disinvestment) for these years.

Data sources: OECD FDI data (OECD_2Csector_april2004.ivt); production shares calculated from OECD STAN database.
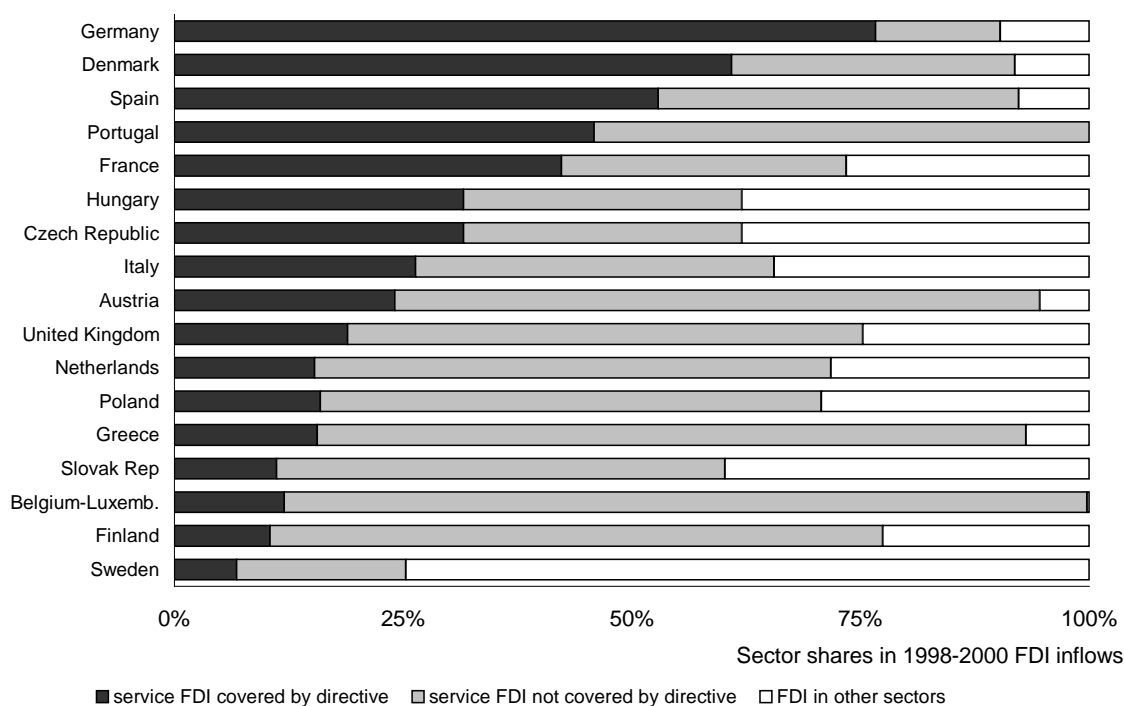
The share of service multinationals in domestic employment reflects the direct investment patterns from the past. When we want to know how the role of foreign service providers is changing, we must look at recent direct investment flows. This is done in Figure 5.2.[35] On average for the EU-15 countries, we find that only one-third of the inflow concerns sectors covered by the proposed EU directive.[36] The remainder of the recent direct investment inflow is accounted for by service sectors outside the domain of the directive, and by non-service sectors. UNCTAD (2004) concludes that nearly two-thirds of all FDI flows are concentrated in services in 2001.

Some might be tempted to conclude from Figure 5.2 that the proposed EU measures are rather irrelevant, but such a conjecture is not justified, since the present structure of the FDI inflows is partly the result of the strong intra-EU regulation differences for services. Indeed, recent research found that that regulation and tax regimes are important determinants of FDI-flows in the OECD (Golub 2003; Nicoletti et al. 2003). Our findings in the next two sections also provide strong evidence that national regulation heterogeneity in the EU forms a major obstacle for the growth of intra-EU direct investment in services.

[35] The sectoral structure of annual FDI flows can be subject to much volatility. Figure 5.3 is based on three-year averages for the period 1998-2000, in order to reduce the role of idiosyncratic annual fluctuations.

[36] Services sectors covered by the proposed EU directive are distribution Business Services, Hotels and Restaurant Services, and Construction. Commercial services sectors not covered by the directive are Financial Services, Transport, Telecommunciaitons, and Energy.

Figure 5.2   Average FDI inflows 1998-2000 and coverage by the EU directive, selected EU member states

Sector shares in 1998-2000 FDI inflows

■ service FDI covered by directive   ▨ service FDI not covered by directive   ☐ FDI in other sectors

Data source: OECD data on the sector structure of FDI inflows.

5.2   Policy factors and bilateral direct investment patterns in services

In Chapter 4 we used the gravity model for the analysis of bilateral service trade flows in the EU. An augmented version of that model will now be used for bilateral FDI patterns. The gravity model's original proponents did not intend to use it for the analysis of bilateral direct investment. However, since then several authors have successfully used it for this purpose.[37] Several authors applied gravity methods for estimating the effects on FDI of EU accession by the Eastern European countries.[38]

The intuition that direct investment is also subject to gravitational factors like market size and distance has in the 1990s been given a firmer theoretical basis by the development of the so-called knowledge capital model of the multinational enterprise. The most articulated treatment of this model is Markusen (2002).[39] The knowledge-capital model provides a coherent framework for predicting the balance between affiliate sales and production in a world where both horizontal and vertical multinationals co-exist. The model explicitly takes account of product differentiation, monopolistic competition and scale economies.

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[37] Cf. Brainard (1997); Hejazi & Safarian (2002); Barrios, Görg & Strobl (2001); Morsink (1998).

[38] For example Brenton & Di Mauro (1999); Brenton, Di Mauro & Lücke (1999); Görg & Greenaway (2002).

[39] It which builds on earlier work co-authored *inter alia* with Venables, Carr, Ethier, Horstmann and Maskus.

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According to Markusen, an essential condition for the rise of multinational enterprises is that firms have firm-specific knowledge assets. The latter may include assets like patents, R&D, reputations, management skills, and network knowledge, and they typically make intensive use of skilled labour. A firm's knowledge capital has often a joint-input or "public good" character. It may be difficult and costly to produce, but once it is created, the knowledge assets can be supplied at relatively low cost to foreign production facilities without reducing the value (or productivity) of those assets in already existing production facilities. For direct investment decisions it is important that the firm-specific knowledge assets can without much additional costs be applied for production in other countries. Hence, the knowledge capital forms the basis of firm-level scale economies. Another determinant of a firm's direct investment decision is the existence of scale economies at plant or establishment level. If plant-level scale economies are very large, the firm will be inclined to concentrate production in one place and export from there to other countries. Plant-level scale economies can only be exhausted if trade costs are not too high. These costs can be such that companies choose for investing in foreign countries to exploit the economies associated with the firm-level knowledge assets.

The model integrates trade and direct investment decisions in a united framework. It finds that trade costs are a necessary condition for the occurrence of multinational companies. This is especially true for "horizontal" multinationals that have the possibility of making and selling a more or less identical product in different locations. Conversely, "vertical multinationals" look abroad to combine their firm-specific knowledge assets with cheaper foreign inputs or resources. The "vertical" multinationals seek to exploit factor-price differences and make use of comparative input costs advantages of foreign locations (e.g. by outsourcing, using low-cost locations as export platforms).[40] Since to our knowledge most direct investment in services is of a "horizontal" (market-seeking) nature, we will further leave aside issues related to "vertical" (input-seeking) FDI.

The knowledge-capital model explicitly takes into account the following factors for the foreign direct investment decision: market size, firm-level scale economies derived from knowledge capital, plant-level scale economies, and trade costs. Some of these elements are typical gravity factors, and it is no coincidence that the knowledge capital model has stimulated econometric work in a gravity type framework (e.g. Brainard 1997; Barrios *et al.* 2001; Carr *et al.* 2001). All find support for gravity variables driving cross-border investment. We will now revert to the same type of analysis for analysing the potential FDI impacts caused by the proposed EU directive.

Table 5.3 lists the relevant variables of the knowledge-capital model and the way in which each variable is expected to influence bilateral FDI patterns (expected sign).

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[40] Also Helpman, in a stream of publications since his (1984) article, extensively dealt with the trade implications of vertical multinationals and global outsourcing. Markusen's knowledge-capital model has several interesting things to say about the conditions in which "vertical" multinationals arise (Markusen 2002: Chapters 5, 8 and 9).

Table 5.2   Testable hypotheses of the augmented gravity model used for direct investment

Factors that affect bilateral direct investment	Operational variable	Expected sign
Traditional gravity factors		
Market size and scale economies in home country	Ln (GDP) country of origin	**+**
Market size and scale economies in destination country	Ln (GDP) country of destination	**+**
Trade costs: transport costs, culture, language	Ln (distance)	**–**
Added factors for knowledge-capital model		
Size similarity of markets (service FDI is assumed to be mainly horizontal)	[GDP original - GDP destination]^2	**+**
Firm-level knowledge capital, technology advantage	* Ln(value added per employee), origin country service sector	**+**
	* R&D intensity origin country	**+**
Policy variables		
Policy heterogeneity (lowers scope for establishment-level scale economies, increases trade costs)	PMR heterogeneity indicator [a]	**–**
Home country regulation (increases fixed costs in home country)	* PMR indicator, origin country	**–**
FDI restrictions in destination country reduces incentive for multinational operation	* FDI restrictions indicator, destination country	**–**

[a] aggregate indicator for heterogeneity in product-market regulation. At the level of sub-indicators: some of them might have a positive sign if policy heterogeneity in a particular area affects the choice between exporting and direct investment, increasing the relative attractiveness of direct investment.

A few remarks are required about the impact of national service market regulation and FDI restrictions on the decision parameters of the knowledge-capital model. As a representative example for market regulation we take the issue of national qualification costs. The latter are incurred in each country. They operate as sunk costs, i.e. once having been incurred such expenses cannot be undone. They add to the trade costs of entering a particular country's service market and thus can be an entry barrier. If potential entrants would have to incur similar costs, which would not be recoverable if the entry failed, they may be scared off.

A second effect is that they add to the fixed costs of producing services in a particular EU country. [41] Expressed in terms of the knowledge-capital model, the fixed qualification costs add to potential plant-level scale economies. For exploiting such scale economies it is necessary that Member States acknowledge the qualification process in other EU countries, so that qualification costs incurred in one country are not (completely) forfeit when the service provider exports or invests in another EU country. It is here that the strong regulation heterogeneity among EU countries disturbs the possibility of exploiting establishment-level scale economies associated with the qualification procedure. Additional fixed qualification

[41] A third regulation effect is worth mentioning: FDI restrictions tend to limit a firm's possibilities for unbundling headquarter operations and production activities. This aspect typically affects "vertical" direct investment, which we do not consider here.

costs are incurred in other EU markets where the firm provides services, and the result is the saw-tooth pattern of average costs as pictured before in Figure 2.1.

A last effect of regulation on FDI may result from the fact that some regulations influence a firm's choice between different international growth strategies, and more in particular the choice between exporting versus setting up a local subsidiary. The case of "tariff jumping" – a foreign firm decides to locate its production within the destination country in order to avoid an explicit trade barrier – is well-documented in the literature.[42]

Data

The foreign direct investment data that we use are inward FDI stocks. They contain the total stock of foreign direct investment in a particular reporting country, with the stock detailed per country of origin, i.e. per country from where the multinational company invested in the reporting country. Bilateral FDI stocks are used rather than annual FDI flows, for three reasons. The first reason is a very practical one: to our knowledge there is no authorised international dataset available for bilateral FDI flows. The second reason is that stock data are closer to the level of actual production by foreign affiliates than annual flow data. Thirdly, bilateral FDI flows are very volatile from one year to another; a few large transactions like mergers may cause large swings in the annual data, sometimes causing negative flows. We used OECD data on bilateral FDI stocks on which we applied a consistency check.[43] All data are for the year 1999.

A handicap for our research was that no authorised international data set is available for bilateral FDI stocks in the services sector. Sectoral data of FDI stock and flow data are available on a country basis, but not on a bilateral basis with countries of origin and destination specified. We therefore use bilateral total FDI stock data, covering all sectors. In order to prevent that this creates a bias later in estimating the impact of the EU directive on investment, we apply a weighting procedure to exclude effects on sectors that are not affected by the proposed EU directive.

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[42] E.g. Blonigen *et al.* (2004); Belderbos (1997); Ellingssen and Warneryd (1999).

[43] For each bilateral FDI stock we have in principle two observations, one from the country that receives the FDI stock and one from the country from which the FDI stock originates. The OECD publishes these bilateral FDI stock data but it has refrained from presenting a consistent and homogenised matrix on the basis of these two data sources. It means that the raw data contain a number of inconsistencies and missing observations. We produce a consistent matrix-shape dataset on the basis of three steps. We start with inward-oriented stock data for each reporting country, because inward FDI stocks tend to be better registered than outward stocks. If a reporting country published no data about inward FDI stock coming from another Member State, we filled up the missing observation by reported outward-oriented stock data from the latter Member State. For those cases in which the reported bilateral stock between home and destination country show substantial discrepancies we apply the following procedure. We have regressed with country dummies on all the outward and inward data to identify countries that typically over-reported or under-reported compared with the mirror data reported by their partner countries. For countries that are thus identified, we always take the data as reported by the partner country.

The average labour productivity of service industries in the country of origin has been calculated from the OECD STAN database. R&D expenditure data from OECD's ANBERD dataset are used to calculate R&D expenditure per unit of GDP of all countries. The origin of all other data is the same as already reported in chapter 4 for the cross-border service trade.

5.3   Empirical results: explaining FDI stocks

For testing the hypotheses of table 5.2 we apply the following reduced-form regression equation:

$$\ln(FDI_{ij}) = \beta_0 + \beta_1 \ln(GDP_i) + \beta_2 \ln(GDP_j) + \beta_3 \ln(DIS_{ij}) + \beta_4 Lan_{ij} + \beta_5 PMR_i$$
$$+ \beta_6 \ln(H_i) + \beta_7 RDI_i + \beta_8 RDI_j + \beta_9 \sum_k HET_{ijk} + \beta_{10} REG_{j1} \qquad (5.1)$$
$$+ \beta_{11} REG_{j2} + \beta_{12} REG_i + \varepsilon_{ij}$$

in which FDI_{ij} represents the FDI stock from country i in the reporting county j. This FDI stock is explained by the GDP in the origin country and the destination country, by the physical distance (DIS_{ij}) between the two countries, and the language distance, Lan. H_i is the labour productivity in the service sector of the country of origin. RDI_i represents R&D intensity (total R&D expenditure per unit of GDP) in the origin country. Regulation heterogeneity between origin and destination country for domain k of product market regulation is expressed by HET_{ijk}. The variable REG_i represents the level of product-market regulation in the origin country, while REG_{j1} and REG_{j2} represent two aspects of regulation intensity in the destination country, respectively for *barriers to entrepreneurship*, and for *FDI restrictions*. In some specifications we further add country dummies for origin and/or destination country.

We test the hypotheses for a slightly larger country group than we did for bilateral service trade. We prefer to seek for cross-section structural patterns by including data for three EU accession countries (Poland, Hungary and the Czech Republic) and the USA, as the EU's largest outside direct investment partner. Analysis with a country dummy for the USA shows that this country's direct investment pattern does not deviate in a significant way from that of the other EU Member States. We have also tested for structural deviation of the EU's accession countries in our country set, but this dummy is not significant.[44] Apparently, the differences between the countries are fairly well covered by the gravity, productivity and policy variables.

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[44] The regression results with country dummies are available upon request.

Table 5.3 presents the most important results that were obtained through ordinary least squares (OLS) regressions. The regression equations for the first three columns have a specification based on equation (5.1), the only difference being the addition of fixed effects (apart for origin and destination country). The last column tests for the effect of market size similarity between origin and destination country.

Discussion of main OLS results

All estimated coefficients for the typical gravity variables are significant and have the expected sign. In general, the coefficients for the market size proxy (GDP) are similar for the destination country and the origin country. The coefficient for distance is about minus 1 which is close to its theoretical value. Once fixed country effects are introduced, the distance parameter is smaller (second an third data columns). We have also tested for the language distance between two countries, using the same sophisticated bilateral linguistic-distance data as in section 4.2. In the OLS regressions for FDI this variable is not significant. It may be explained by the fact that service multinationals typically use local personnel in their affiliates.

As variables for the knowledge-assets model we included two technology variables: the labour productivity in the service sector of the origin country, and R&D intensity in the origin country. In the regression equations without policy variables (not reported), the estimated coefficients for all technology variables are significant and have the predicted sign. The productivity of services in the origin country – used as a proxy for knowledge-related assets that provide firm-level scale economies for foreign affiliates– is significant in all specifications and has the predicted sign. This result therefore is consistent with the prediction of the knowledge-capital model. That does not hold for the R&D intensities: as soon as policy variables are added it dropped out as non-significant. We have therefore deleted the R&D intensities from the main regression equations reported in table 5.3.

Moreover, the last column of table 5.3 reports a separate test for the effect of market size similarity on FDI. According to the Markusen model, this would have a positive effect on FDI when horizontal (market-seeking) FDI dominates. The estimation result did not confirm this prediction, as the estimated coefficient appeared not to be statistically significant.[45]

In the standard OLS regressions all indicators for regulatory heterogeneity have the predicted negative sign –except the one for *Explicit barriers to trade and investment*. However, only the estimated coefficients for heterogeneity in *Barriers to competition*, and *Regulatory and administrative opacity* are statistically significant.

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[45] Note that total FDI stocks also include manufacturing where vertical FDI motives (input-seeking) may be important. This could obscure the role of market-size similarity with regard to service FDI.

Table 5.3 Bilateral foreign direct investment (inward), 1998: method OLS

Dependent variable: Ln (bilateral inward direct investment stock)

Estimation Method [a)]	OLS, 1	OLS, fixed effects origin	OLS, fixed effects destination	OLS, 2
Variables augmented gravity model				
Ln GDP Origin	0.90***		0.92***	
	(0.10)		(0.10)	
Ln GDP Destination	0.99***	0.88***		
	(0.09)	(0.10)		
Ln Summed GDPs, origin and destination				1.58***
				(0.24)
Ln Squared GDP difference, origin and destination				− 0.08
				(0.07)
Language	− 0.61	−0.51	− 0.46	− 1.25***
	(0.50)	(0.62)	(0.52)	(0.54)
Ln Distance	− 0.91***	− 0.61***	− 1.08***	− 0.87***
	(0.14)	(0.20)	(0.16)	(0.17)
Ln (service sector productivity origin country)	2.04***		2.13***	2.19***
	(0.28)		(0.30)	(0.28)
Ln (service sector productivity destination country)		− 0.51*		
		(0.31)		
R&D intensity (in % of GDP), origin country				− 0.57
				(1.11)
Regulation variables				
Heterogeneity, administrative barriers for start-ups	− 0.54	0.04	− 0. 38	− 0.06
	(0.69)	(0.69)	(0.68)	(0.74)
Heterogeneity, barriers to competition	− 4.48***	− 3.27***	− 3.71***	− 5.11***
	(1.07)	(1.30)	(1.21)	(1.14)
Heterogeneity, regulatory and administrative opacity	− 1.45**	− 0.00	− 1.20	− 1.60***
	(0.73)	(0.89)	(0.77)	(0.79)
Heterogeneity, state control	− 1.31	− 1.23	−1.47	− 1.17
	(0.98)	(1.16)	(1.04)	(1.08)
Heterogeneity, explicit barriers to trade and investment	0.77	0.23***	1.48*	0.18
	(0.57)	(0.81)	(0.81)	(0.60)
Level product-market regulation, origin country	− 0.65***		− 0.78***	− 0.51***
	(0.20)		(0.20)	(0.24)
Regulation intensity Barriers to Entrepreneurship, destination country	− 0.46***	− 0.44***		− 0.19
	(0.19)	(0.17)		(0.20)
FDI regulation indicator, Destination country	−3.09	− 6.05***		− 4.07*
	(2.11)	(2.13)		(2.31)
Constant	− 13.14***	country dummies origin	country dummies destination	− 9.39***
	(2.09)			(2.20)
Number of observations	196	184	196	196
Adjusted R-squared	0.75	0.76	0.77	0.71

[a)] Absolute value of standard error in brackets.

The following symbols are used for statistical significance levels: *** significant at 1% level; ** significant at 5% level; * significant at 10% level.

Data source for OECD regulation data: OECD (2003); Nicoletti, Scarpetta and Boylaud (2000); and Golub (2003) for FDI restriction indicators.

The estimated coefficients for the regulation *level* variables had the predicted sign and most were statistically significant. The hypothesis in Table 5.2 that a high level of product market regulation in the origin country reduces outward investment, because more regulation hampers competitiveness, is confirmed by the OLS results. The same holds for the hypothesis that the level of regulation (*Barriers to entrepreneurship)* in the destination country also has a negative impact on direct investment.

FDI restrictions in the destination country are only significant when fixed effects for the origin countries are taken into account. The other results for OLS with fixed effects are more or less the same except for the heterogeneity in *Regulatory and administrative opacity* which is no longer statistically significant. The magnitude of the estimated coefficients for most policy variables decreases somewhat, apparently because the policy variables did pick-up some other country differences. Special attention deserves the now significant and positive parameter for heterogeneity in *Explicit barriers to trade and investment.* An explanation can be that in this policy area the effects for exports dominate over the effects on FDI: more trade barriers makes FDI as an alternative supply form more attractive. This is the so-called tariff-jumping argument.[46]

The results could be influenced by unobserved specific heterogeneity between the countries. To account for that we apply here the same procedure as in chapter 4, namely by correcting all actual bilateral variables by their individual, country-wise mean. By doing this separately for origin and destination countries we account non-parametrically for possible unobserved variables in the bilateral relations between FDI partner countries. The so-called DM procedure is described more extensively in section 4.3 and Annex 3.[47]

The DM results are reported in table 5.4, with and without fixed effects. The regression equations for origin country or country are tested simultaneously using the Seemingly Unrelated Regression (SUR) procedure. In general, the statistical significance and sign of the estimated coefficient does not change much compared to OLS with fixed effects. There is however some variation in the absolute values of the coefficients in particular for the case without fixed effects. We concentrate here on the case with fixed effects, because this estimation includes as much unobserved heterogeneity of the countries of origin and destination as is possible. The productivity variable implied by the knowledge-capital model becomes smaller but it remains positive and significant, while language differences still remain non-significant for bilateral FDI.

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[46] This explanation is conssitent with the significant negatieve sign for heterogeneity in explicit barriers to trade and investment in tte estimations for bilateral trade.

[47] Like in section 4.3 we impose identical coefficients for distance and language in the equations for origin and destination country. We do the same and also impose identical coefficients for policy heterogeneity for origin and destination country.

Table 5.4   Factors explaining bilateral FDI stocks (inward) after accounting for country-pair effects (DM method)

Dependent variable: Ln (bilateral inward direct investment stock), all industries, 1998
Estimation method: Seemingly Unrelated Regression (SUR)[a] based on transformed variables (DM method)

Country perspective[b]	Origin	Destination	plus fixed effects Origin	plus fixed effects Destination
Variables augmented gravity model				
Ln GDP Origin	0.70***		0.95***	
	(0.08)		(0.09)	
Ln GDP Destination		0.67***		0.74***
		(0.06)		(0.06)
Ln Distance	−0.61***	−0.61***	−1.08***	−1.08***
	(0.11)	(0.11)	(0.13)	(0.13)
Language distance	−0.35***	−0.35***	− 0.15	− 0.15
	(0.14)	(0.14)	(0.14)	(0.14)
Ln (service sector productivity origin country)	0.05***		0.05***	
	(0.01)		(0.01)	
Policy variables				
Heterogeneity, Administrative barriers for start-ups	0.31	0.31	0.48	0.48
	(0.47)	(0.47)	(0.44)	(0.44)
Heterogeneity, Barriers to competition	− 2.08***	− 2.08***	− 3.28***	− 3.28***
	(0.82)	(0.82)	(0.84)	(0.84)
Heterogeneity, Regulatory and administrative opacity	-0.69	-0.69	− 0.89	− 0.89
	(0.56)	(0.56)	(0.56)	(0.56)
Heterogeneity, State control	− 1.91***	− 1.91***	− 1.43**	− 1.43**
	(0.78)	(0.78)	(0.77)	(0.77)
Heterogeneity, Explicit barriers to trade and investment	− 0.15	− 0.15	0.30	0.30
	(0.43)	(0.43)	(0.54)	(0.54)
Product market regulation, origin country	− 0.71***		− 0.87***	
	(0.16)		(0.18)	
Barriers to entrepreneurship, destination country		− 0.10		− 0.21
		(0.13)		(0.13)
FDI regulation indicator, destination country		− 9.39***		− 8.27***
		(1.39)		(1.42)
Constant	0.07	0.07	dummies for destination coun-tries significant	dummies for origin countries significant
	(0.11)	(0.08)		
Number of observations	260	260	195	260
Adjusted R-squared	0.63	0.47	0.66	0.47
Used for variants?	No	No	No	Yes

[a] Seemingly Unrelated Regression (SUR), applying simultaneous estimation of equations for origin and destination countries. All bilateral variables expressed as deviation from the mean. This is done separately from the FDI-origin country perspective, and from the FDI-destination country.
Absolute value of standard error in brackets. Codes: *** = significant at 1% level;   ** = significant at 5% level; * = significant at 10% level.
[b] See Annex 3 for the calculation procedure.
Data source for country regulation data: Nicoletti, Scarpetta and Boylaud (2000); Golub (2003) for FDI restriction data; bilateral FDI stock data from OECD (2003).

The results show – once we account for specific country-pair effects– that also policy differences with regard to *State control* emerge as a significant, negative factor for bilateral FDI. The coefficients for the policy heterogeneity in *Barriers to competition* and *State control* are negative and statistically significant at the 1% level. The effect of *State control* is half the effect of heterogeneity in policies with regard to *Barriers to competition*. Policy heterogeneity in the area *Explicit barriers to trade and investment* is no longer significant after taking country-pair effects into consideration. Hence, in the end we find no support for the tariff-jumping hypothesis. The regulation level (*Barriers to entrepreneurship*) in the destination country is not significant, but the coefficient for the *FDI restrictions* in the destination country is about 50% larger than in the OLS regressions.

The results in the last data column of Table 5.4 are our preferred estimates. Controlling for country effects, country-pair effects, they describe which impact policy variables have on bilateral FDI. We will use these estimates as the basis for estimating the FDI impact of the EU Services Directive.

5.4   Impact of the proposed EU directive on FDI

The empirical results in the preceding section show that the size of bilateral FDI stocks is seriously affected by the heterogeneity and intensity in regulation. Using these quantitative results we now investigate the effects on the bilateral FDI stocks when the proposed EU directive would become effective.

As a starting point we take the results of the DM/SUR method with fixed effects for the country of origin, because it accounts as best as possible for unobserved variables (last column Table 5.4). To account for the effects of the EU directive on bilateral regulation heterogeneity we again use the impact of the EU directive on the regulation heterogeneity described in Table 3.4. The investment effects of the EU proposals also include the effect of these measures in the form of a lower *level* of national FDI restrictions in the destination countries.[48]

For every country pair we estimate the expected change in FDI stocks that results from the implementation of the EU directive. The change percentage differs for each bilateral relation, because the heterogeneity in regulation and the change induced by the EU directive vary for each country pair.[49] Because the estimated coefficients apply to *total* FDI stocks, we correct the total result for the share in FDI stock of those services that are covered by the proposed EU directive. As reported in section 5.1, in the period 1998-2000 one-third of average FDI inflows in the EU went to sectors that are covered by the proposed EU directive. We therefore use a

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[48] For the level effect we assume a 30% reduction for investors from other EU member states. This is a conservative estimate, because the directive does not aim at abandoning national regulation or lowering national regulation levels. However, some elements of the directive (single point of contact, electronic handling of administrative requirement for firm start-ups, a ban on discriminative requirements for foreign firms) will effectively lower the level of regulation as experienced by investors from other EU member states.

[49] See footnote 30.

0.33 correction factor. This correction is on the conservative side, since the aforementioned one-third share of 1998-2000 FDI inflows is partly the endogenous result of the present-day policy heterogeneity and sectoral FDI restrictions in the Member States.

The resulting changes in FDI stocks are presented as a bandwidth between a maximum and a minimum effect. The bandwidth results from two sources of uncertainty: a statistical uncertainty with regard to the coefficient estimates,[50] and an uncertainty as to the implementation of the directive (shown in table 3.4). The two kinds of uncertainties are combined to three variants: minimum-effect variant, central variant, and a maximum-effect variant. The central variant is calculated by using the parameter estimates and the middle of the bandwidth on the expected impact of the directive on regulatory heterogeneity.

Table 5.5 presents the results for the EU17, together with a decomposition showing the magnitude of the underlying factors for the EU as a whole. The total effect ranges between 18 and 36 per cent. The largest effects are caused by the fact that the EU measures will reduce the heterogeneity in *Barriers to competition* and the level of *FDI restrictions*. The small effect

Table 5.5	Impact of EU directive on intra-EU FDI stocks (% change based on 1999 data)		
Effects	Minimum variant	Central variant	Maximum variant
Total effect on bilateral FDI stocks in the EU17	18	26	36
Due to less heterogeneity in *Barriers to competition*	7	12	18
Due to less heterogeneity in *State control*	0	1	2
Due to lower level of FDI restrictions in destination countries	11	13	16
PM: possible effects of other regulatory indicators [a]		13	

[a] This refers to the other policy variables reported in Table 5.4 (last column): heterogeneity in *Administrative barriers to start-ups*, heterogeneity in *Regulatory and administrative opacity*; heterogeneity in *Explicit barriers to trade and investment,* and the regulation level in the destination countries with respect to *Barriers to entrepreneurship*.

Source: own calculations based on the results in the tables 3.4 and 5.4 (last column).

that the measures in the form of less heterogeneity in *State control* will also have a positive impact on bilateral FDI.

Table 5.5 also reports the possible effects that the EU measures may have through the other policy variables. Though the estimated coefficients for these other factors are not statistically significant, there may still be some impact. The combined effect of these other factors (using the estimated coefficients) would be an extra increase of bilateral FDI stocks by 13 per cent, mostly due to diminished heterogeneity with respect to *Regulatory and administrative opacity*. If these additional effects indeed would occur, then the total impact of the measures would

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[50] We take an uncertainty interval between plus and minus one standard error for the estimated coefficient.

become even larger. Due to the statistical uncertainty of these latter effects we prefer to consider these elements as *pro memori* items.

Decomposition of the effects by country

After presenting the simulation effects of the proposed directive on total intra-EU direct investment stocks we outline the expected effects for individual EU member states. We concentrate on the central variant. Table 5.6 presents the relative and absolute increases in FDI stocks.

The table shows that the relative growth in outward FDI stocks varies from 47 per cent for Hungary to 23 per cent for Ireland. For inward FDI stocks, the variation in relative growth between countries is even wider: from 65 per cent in Austria to 21 per cent in The Netherlands. Like in the case of service trade, the dispersion in growth rates between individual countries is determined by the initial characteristics of each country's FDI destination countries and FDI origin countries. Countries, from which most FDI initially went to countries with strong

Table 5.6   **Simulated absolute and relative increase in FDI stocks due to the proposed EU measures by member state, central variant, reference year 1999**

Reporting country	Relative increase in %		Absolute increase in billion US$ [a]		
	Outward FDI stocks	Inward FDI stocks	Outward FDI stocks	Inward FDI stocks	Net change in FDI position [b] % of initial inward FDI stocks
Hungary	47	45	0.1	3.9	43
Portugal	42	39	1.5	7.6	32
Poland	36	53	0.2	11.0	52
Austria	36	65	4.2	11.7	42
Spain	33	41	4.0	19.5	33
Czech Republic	33	42	0.1	6.6	42
Denmark	33	29	7.5	5.8	-8
Italy	31	39	31.1	16.5	-26
Germany	31	25	65.8	43.5	-13
Finland	29	41	7.7	6.7	-7
Greece	27	36	0.2	5.0	34
Sweden	25	31	15.2	14.4	-2
Belgium-Luxembourg	25	23	26.2	37.4	7
United Kingdom	24	21	58.0	39.0	-10
Netherlands	24	21	62.3	55.1	-3
France	24	25	37.4	26.2	-11
Ireland	23	22	4.0	15.3	16
EU17	26	26	325.3	325.3	0

[a] In the simulations, we only account for the effects of the EU measures on the level of FDI restrictions in destination countries, and for the decreased heterogeneity in product-market regulation within the EU.
[b] Change in inward FDI stocks less change in outward FDI stocks. A negative sign means that a country has a net increase in outward FDI stocks.

bilateral heterogeneity in product-market regulations and/or high levels of FDI restrictions, will experience the strongest effect from the EU measures. Conversely, member states whose investment partners had similar product-market regulations and low levels of FDI restrictions

will experience relatively few effects of the proposed directive. Table 5.7 illustrates this for the structure of inward-oriented FDI stocks in Poland and the Netherlands. The origin countries of FDI stocks in Poland were more heterogeneous with respect to product market regulation (*Barriers to competition*) than for the Netherlands. The variation in inward FDI stocks is not only explained by the heterogeneity in regulation, but also by the FDI restrictions in the country of destination. These restrictions are much higher in Poland than in the Netherlands, so the change in restrictions due to the EU directive is also much higher for Poland.

Table 5.7   **Growth of inward FDI stocks due to the EU measures, and initial characteristics of investment partner countries: the case of Poland and the Netherlands, 1999**

	Poland				Netherlands		
Origin country	% of inward FDI stocks	hetero-geneity BC [a]	level FDI restrictions destinat. [b]	Origin country	% of inward FDI stocks	hetero-geneity BC [a]	level FDI restrictions destinat. [b]
Netherlands	32.1	0.27	0.213	United Kingdom	41.9	0.22	0.083
Germany	25.9	0.48	0.213	Germany	15.6	0.26	0.083
France	14.9	0.30	0.213	France	10.9	0.11	0.083
Subtotal C3 [c]	72.9	0.35	0.213	Subtotal C3	68.4	0.21	0.083
Italy	5.3	0.41	0.213	Italy	10.1	0.35	0.083
United Kingdom	4.5	0.52	0.213	Belgium-Lux.	9.0	0.15	0.083
Austria	4.0	0.26	0.213	Sweden	5.3	0.14	0.083
Denmark	3.3	0.71	0.213	Ireland	3.4	0.23	0.083
Sweden	3.2	0.46	0.213	Finland	2.2	0.20	0.083
Total C8 [d]	93.2	0.38	0.213	Total C8	98.4	0.22	0.083

a) Heterogeneity of partner countries with respect to *Barriers to competition*.
b) Since this table is about changes in inward FDI stocks, the same reduction in FDI restrictions in a destination country accrues to all FDI origin countries.
c) Subtotal 3 most important FDI origin countries.
d) Subtotal 8 most important FDI origin countries.

The country decomposition in Table 5.6 shows that all member states will experience a growth in outward and a growth in inward FDI stocks due to the EU measures. This table also presents the expected net change in FDI positions due to the EU measures, expressed as percentage of the country's inward FDI stocks in 1999. Six countries (Italy, Germany, the UK, Denmark, Sweden, France, Finland and the Netherlands) are expected to have a net increase in outward FDI position; for all other members states we expect a net increase in the inward FDI stocks.

5.5   Conclusions

Direct investment between EU countries appears to be strongly affected by inter-country heterogeneity of product-market regulation. For explaining bilateral direct investment stocks we adapt the gravity model with several elements of the knowledge-capital model developed by Markusen. The model is becoming the standard explanation for direct investment decisions by multinational enterprises. This model allows for an integrated treatment of trade and direct investment decisions in international service markets. We have also added variables for bilateral heterogeneity in product-market regulation, and for the level of regulation in origin and destination countries.

The empirical results are consistent with most of the hypotheses drawn from the augmented gravity model. Both the "traditional" gravity variables (market size, distance) and the variable for the Markusen model (productivity level) perform well in all investigated regression equations. They have the expected sign and are statistically significant. Also the variables for bilateral heterogeneity in product-market regulation and for the regulation intensity are statistically significant and have the expected signs, even after controlling for unobserved variables.

We have subsequently applied the regression estimates to assess the effects of EU proposals on bilateral FDI stocks. For the EU17 as a whole, the increase in bilateral direct investment stocks will be in the range between 18 and 36 per cent. These increases are mainly due to reduced policy heterogeneity in *Barriers to competition*, and to a lower level of *FDI restrictions* in destination countries.

At a more disaggregate level, we find that all EU member states will experience a growth in their inward and in their outward FDI stocks. Regarding inward FDI stocks, the strongest effects will occur in (destination) countries that formerly had much policy heterogeneity with their FDI origin countries. The EU accession countries, Austria, Spain and Portugal will experience the largest relative increase of inward direct investment stocks. These countries will also register the largest relative increase for outward FDI stocks.

6 Conclusions

6.1 Summary of the main findings

The free movement of services within the EU is hampered by many regulatory barriers. These barriers are present at every stage of the business process: from establishment, to the use of foreign inputs, and the promotion, distribution, sales and after-sales of services. Consumers face higher prices because of extra production costs and less variety because less foreign providers enter the market.

It is primarily the heterogeneity of national service regulations, rather than the intensity of national regulations that hampers bilateral trade and investment. Even if Member States have different preferences for the level of regulation of services industries, they might still adopt a common architecture in service regulation and make more use of mutual recognition of national service regulation. In this way it may be possible to avoid that heterogeneity in regulation acts as a trade barrier. It is in this sense that the European Commission has introduced a potentially very strong proposal.

The EC proposal consists of measures to reduce or eliminate the obstacles to cross-border trade in services by introducing the 'country of origin' principle. It implies that the exported service is subject to regulation of the country of origin, and that the country of destination has no right to impose new regulation. The Commission has also proposed measures to reduce the obstacles for the establishment of an affiliate abroad by, *inter alia*, introducing a single point of contact where foreign service providers can handle all administrative requirements and procedures. Moreover, the EC also introduces mechanisms to build up trust of the member states in each other's national regulatory regimes.

For quantifying the effect of the proposed EU directive on regulatory standards we construct a bilateral indicator of heterogeneity in product-market regulation. We apply this indicator to data from the OECD Regulation database, largely based on a detailed survey comprising hundreds of questions on regulation. On the basis of this data material we derive a numerical indicator for bilateral policy heterogeneity, for all EU country pairs. We decompose the overall heterogeneity indicator into five components, each corresponding with specific domains in product-market regulation. Detailed analysis of the concordance between the regulation items of the OECD database and the EU proposals learns that not all heterogeneity components will be affected to the same extent. The heterogeneity components *Regulatory and administrative opacity*, and *Explicit barriers to trade and investment* are heavily affected by the EU directive. The components *Administrative burdens for start-ups* and *Barriers to competition* are moderately affected by the EU directive and the component *State control* is hardly affected. The results are used to estimate the impact of the EU directive on bilateral trade and investment.

In the empirical analysis we use a gravity model for explaining bilateral service trade and direct investment. The gravity equation explains the volume of trade by distance factors

(physical and language distance), market size (GDP of origin and destination country) and by regulatory barriers. Various specifications and estimation methods lead to similar results: the heterogeneity indicators for regulation are significant variables that reduce the volume of trade in commercial services. Less heterogeneity in regulation - as is the aim of the EU directive - could thus stimulate trade in services according to our evaluation. We estimate that bilateral trade in the EU could increase by about 30% to 60%. This range in outcomes depends on the bandwidth of the impact to the EU directive on the regulatory indicators and on the uncertainty of the parameter estimates. For countries that face relatively much heterogeneity in regulation with their partner countries, like Denmark, Austria, Greece, Italy, Spain and Portugal, the changes in service exports and imports are larger. For other countries, such as the Netherlands and Belgium, the relative changes are expected to be smaller.

Direct investment in services between EU countries appears to be strongly affected by inter-country heterogeneity of product-market regulation. For explaining bilateral direct investment stocks we adapt the gravity model with several elements of the knowledge-capital model developed by Markusen. The model is becoming the standard explanation for direct investment decisions by multinational enterprises. This model allows for an integrated treatment of trade and direct investment decisions in international service markets. Both the variables of the "traditional" gravity model and the typical variables for the Markusen model perform well in all investigated regression equations.

The policy variables and the policy heterogeneity variables are statistically significant and have the expected signs. Using the preferred regression estimates we have subsequently calculated the possible effects of the EU proposals. As Figure 6.1 shows, the full

Figure 6.1 **Percentage increase of trade in Other Commercial Services and in bilateral FDI stocks due to EU Services Directive**
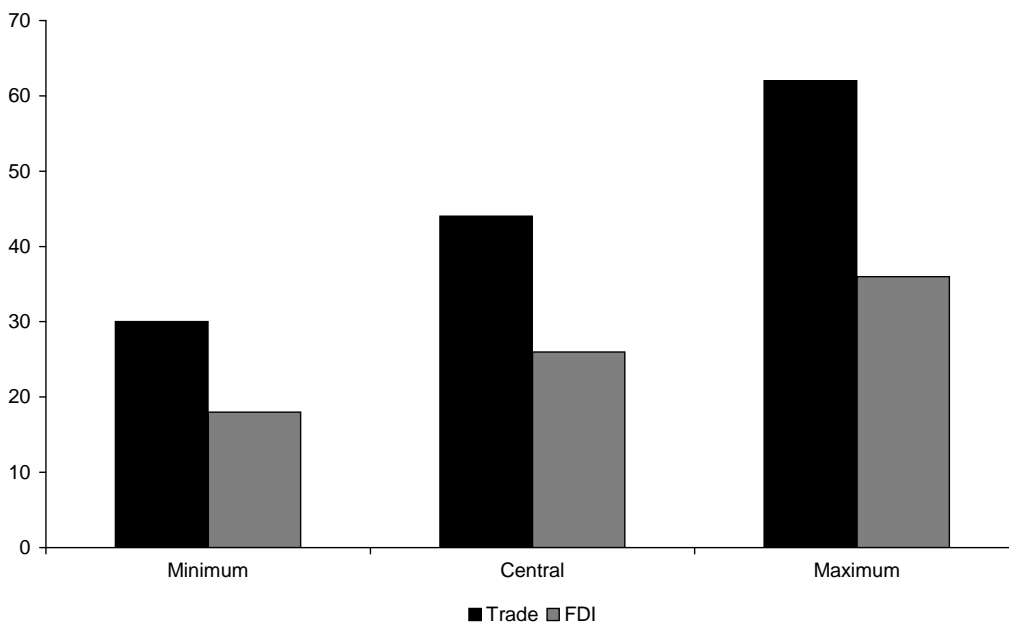
implementation of the directive could increase trade in commercial services by about 30 to 60 per cent. The average EU increase in bilateral direct investment stocks will be in the range of 20 to 35 per cent, mainly due to less heterogeneity in barriers to competition and less FDI restrictions.

6.2   Welfare aspects

More openness and less policy heterogeneity in the EU's Internal Market for services cause several domestic welfare effects.

The overall economic growth potential of EU countries may improve due to a rise in the productivity of the service industries, and thereby contributes to the Lisbon Agenda of the European Union. There are three main channels along which the productivity jump may take shape: (a) the service sector will be better capable of exploiting scale economies through production for other EU markets; (b) the competitive selection process will become stronger, causing under-performing firms to exit sooner; and (c) the influx of more productive foreign subsidiaries raises overall productivity of domestic service industries.[51] With regard to the last-mentioned productivity effect, several authors provide evidence for the existence of positive spill-overs in the USA and the UK (Haskel *et al.* 2002; Keller and Yeaple 2003). It is plausible that in services, and in particular intermediate services, positive spill-overs will occur through forward linkages.[52] We found evidence – presented in table 6.1– that multinational firms in EU service industries might have a higher productivity than their domestic competitors, although this is not the case for all countries.

Another welfare effect runs through changes in the domestic producer surplus. In some cases, the profits of domestic service producers will be affected positively due to more export possibilities. Less competitive domestic producers will see their profits affected in a negative way. The balance between these two groups of producers will differ among the EU countries.

More competition lowers service prices, brings more variety and innovative service products. This will enlarge the consumer surplus, and thus benefit domestic consumers in most EU countries. Also producers can benefit. Since a number of the service sectors involved are providers of intermediate inputs, more EU-wide competition will lower intermediate unit input prices and thus make the client industries more competitive.

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[51] Cf. Görg and Strobl (2001).

[52] Smarzynska Javorcik (2004) argues that such spillovers mainly arise through vertically oriented FDI (backward linkages, joint ventures) and not so much through horizontal direct investments and forward linkages. This analysis is only based on evidence for manufacturing, however.

Table 6.1   **Productivity differences between majority-owned foreign affiliates and domestic firms in the Non-financial market services sector, selected EU countries 1997-1998**

Country	Value added per person engaged in total commercial services (in 1000 US $)	Productivity gap between foreign affiliate and domestic firms, non-financial commercial services, %
Countries where foreign affiliates have a higher productivity		
Austria	63.4	20.6
United Kingdom	49.4	2.8
Netherlands	53.5	1.7
Germany	64.9	11.5
Italy	66.5	9.3
Belgium-Luxembourg	68.4	1.2
Hungary	15.4	7.8
Countries where foreign affiliates have a lower productivity		
Poland	13.3	– 0.1
Portugal	28.4	– 1.4
United States	58.6	– 0.5
Finland	65.3	– 0.4
France	72.5	– 1.1
Sweden	73.1	– 0.5

Productivity is expressed as value added per employee. For Germany, Austria, Belgium, Italy and Poland we use turnover per employee because only these data are available; for consistency this second-best productivity indicator is compared with total production per employee in the host-country service sector.
Source: calculated from OECD FATS and STAN databases.

The welfare effects described above are generally positive for the EU as a whole. The country-specific effects will vary. There are also some negative effects. Some intra-sectoral and inter-sectoral restructuring processes and employment shifts are likely to take place in domestic service industries. It is arguable that the process may proceed in the least painful and quickest way in countries with the more flexible procedures for employment shifts, bankruptcy and new firm start-ups.

Finally, the implementation of the EU directive may in Member States have non-negligible direct policy costs. Many laws and regulations pertaining to the service sector may have to be changed. It is imaginable that in some cases even the domestic organisational framework charged with implementing the previous regulations, will have to be changed. These are one-off welfare costs that may be compensated by more enduring welfare gains throughout the rest of the domestic economy.

The welfare aspects described above are not systematically evaluated nor quantified in this paper. A thorough assessment of these welfare affects would have to make use of an applied general equilibrium model, which includes the modelling of imperfect competition, entry and exit of firms and sectoral FDI flows, and the substitution between trade and foreign direct investment. Such a

model is not readily available. A first necessary step would in any case be the examination of the relation between the level of and the heterogeneity in regulation and service trade and foreign direct investment within the EU. The latter aspect is what we have on in this study. We conclude that the effects on bilateral trade in commercial services and FDI could be substantial if the EU directive is fully implemented. For all member states the effects are substantial, although it is not yet clear how this would translate into welfare effects.

According to the traditional comparative advantage theorem all countries may gain in welfare by liberalising trade, although the extent of the gains may differ between countries. The comparative advantage theorem only compares free trade versus autarky, but it does not allow for scale effects, imperfect competition, and multinational production. If these issues are introduced, the welfare changes brought about by liberalising trade and investment may get more complex and more unevenly distributed. Our direct effects on trade and investment do not suggest this, but a fully general equilibrium analysis that includes sectoral reallocation effects could lead to another picture. The literature does not give much guidance here. Markusen (2002: Ch. 8) found that small host countries generally win from liberalisation while large countries under some conditions may loose somewhat from investment liberalisation.[53]

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[53] This finding is consistent with the so-called "optimal tariff" literature; the latter allows for competitive or imperfect competition models in which a larger country may be better off by having some trade protection, due to terms of trade effects.

Annex 1: Policy heterogeneity indicator

Ideally, what we would like to have are indicators of the costs (or margin loss) that exporters and investors incur as a consequence of non-tariff barriers when they want to trade with or invest in a regulated market of an other EU member state. We developed a measure for aggregating information on heterogeneity in non-tariff barriers across EU countries.

Basic idea[54]

Policy heterogeneity typically relates to qualitative data that may differ in many dimensions. Qualitatively different data relating to individual players in a particular setting cannot be aggregated numerically, because they do not share a common dimension. Dimension heterogeneity is the crucial problem here. In the case of completely unrelated data, the story would end here.

Nonetheless, in a setting where the qualitatively different data relate to individual players, and/or to a number of attributes or functions of these players, we may get step further. The similarity or dissimilarity of the data can be dissected along the dimensions of the players, their attributes or functions, and the distinct aspects that describe parts of these functions or attributes.

Without a common standard or denominator direct numerical comparison is ruled out. What we can do is to apply pair-wise comparisons: are two players yes or no identical with regard to a particular function, attribute, or aspects thereof? That information element from the pair-wise comparison may be preserved for numerical purposes. It is information of a binary nature: players are identical or non-identical with regard to the compared item. The method described below uses this binary logical information for the development of heterogeneity indicators.

Formal analysis for heterogeneity in qualitative data

Let there be *n* independent players. The players differ in many respects, but we can discern some function or attribute *k* on the basis of which we can do pair-wise comparisons. For this comparison item *k* we can establish whether players differ *yes* or *no*. For this comparison item we use bilateral heterogeneity indicator h_{ij}^k that has the value of zero in case of player similarity, and the value of *1* in case of player dissimilarity. Hence, we have:

$$h_{ij}^k \in \{1,0\} \quad for \quad \forall\, i, j \subset (1,..,n) \tag{A1}$$

We can extend the pair-wise comparisons to all players in the system. The comparison information can be gathered in an item dissimilarity matrix, called H^k. For a case of five players (*a,b,c,d,e*) this matrix looks like:

$$H^k = \begin{bmatrix} 0 & h^k_{ba} & h^k_{ca} & h^k_{da} \\ 0 & 0 & h^k_{cb} & h^k_{db} \\ 0 & 0 & 0 & h^k_{dc} \\ 0 & 0 & 0 & 0 \end{bmatrix} \tag{A2}$$

Most of the elements of the dissimilarity matrix are zeros, because only half of the pair-wise player comparisons are relevant, and because the comparison of each player with itself also yields a zero. The more dissimilar players are with respect to comparison item k, the more unity values we will see in the matrix. This information can be aggregated in a single item heterogeneity indicator HG^k:

$$HG^k = \sum_i \sum_j h^k_{ij} \tag{A3}$$

The nicety here is that we have a numerical indicator for typifying the degree of heterogeneity. The higher its value, the more heterogeneous the system is. We may also derive a player deviancy indicator. For player i this would be:

$$DV^k_i = \sum_j h^k_{ij} \tag{A4}$$

and of course:[55] $\quad HG^k = \sum_i DV^k_i \tag{A5}$

The deviancy indicator expresses the extent to which player i differs from all other players according to comparison item k. It yields a number which in itself may not be very informative. It can therefore also be expressed in relative terms, normalising the indicator for player i with the performance of the median player:

$$DVR^k_i = \frac{DV^k_i}{DV^k_g} \tag{A6}$$

in which DV^k_g is the deviancy index for the median player, found after ranking the deviancy indicators for all the n players. The player deviancy indicators are dimensionless numbers. They give no information about the nature or causes of the heterogeneity itself, e.g. whether a player is high/low, strict/lenient or intensive/extensive with regard to a particular characteristic. A heterogeneity or deviancy indicator therefore will always have to be used in combination with a dimensioned level indicator.

The approach can be extended to more complex heterogeneity problems, for which intuitive heterogeneity analysis would no longer be an option. If we want information about structural rather than incidental dissimilarity between players, then it is necessary to extend the player

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[55] Both indictors can *ad libitum* be corrected for missing bilateral observations in the pair wise comparisons, i.e. by counting only the non-missing observations where h^k_{ij} is either zero or unity.

comparison to a larger number of comparison items. We first take the case that players differ in m ($\forall m \subset \{k1, k2, k3, ...K\}$) different functions.[56] Many comparison items are of a more complex nature than simple yes-no questions, meaning that difference between players can only be described after imposing a logical hierarchy in the differences between players. The term "function" is used in the main text to describe a high-order comparison category. If players differ in m functions, we get the following matrix system of pair-wise comparisons:

$$H^m = \begin{bmatrix} 0 & h_{ba}^{k1} & h_{ca}^{k1} & h_{da}^{k1} & 0 & h_{ba}^{k2} & h_{ca}^{k2} & h_{da}^{k2} & \cdots & 0 & h_{ba}^{K} & h_{ca}^{K} & h_{da}^{K} \\ 0 & 0 & h_{cb}^{k1} & h_{db}^{k1} & 0 & 0 & h_{cb}^{k2} & h_{db}^{k2} & \cdots & 0 & 0 & h_{cb}^{K} & h_{db}^{K} \\ 0 & 0 & 0 & h_{dc}^{k1} & 0 & 0 & 0 & h_{dc}^{k2} & \cdots & 0 & 0 & 0 & h_{dc}^{K} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \cdots & 0 & 0 & 0 & 0 \end{bmatrix} \qquad \text{(A7)}$$

The heterogeneity and player heterogeneity indicators then become:

$$HG^m = \sum_m \sum_i \sum_j h_{ij}^m \quad \text{and:} \quad DV_i^m = \frac{1}{j} \sum_m \sum_j h_{ij}^m \qquad \text{(A8)}$$

The analysis of player heterogeneity can be further refined by taking into account that players may have different s qualitatively different ways or modes for dealing with a particular function m, with $s \subset \{s1, s2, s3, ...S\}$. Figure A1 gives an example by applying the analysis to some elements of policy heterogeneity. The number of actually found modes may differ per function, but it cannot be higher than the total number of players that are compared.[57] Here we take S as the maximum number of modes in which any function m may differ. The number S of course enlarges the dimensions of the resulting heterogeneity matrix H^{ms} compared to H^m. The heterogeneity and player deviancy indicators must of course be adapted for the added comparison dimensions:

$$HG^{ms} = \sum_s \sum_m \sum_i \sum_j h_{ij}^{ms} \quad \text{and:} \quad DV_i^{ms} = \frac{1}{j} \sum_s \sum_m \sum_j h_{ij}^{ms} \qquad \text{(A9)}$$

Because not all compared functions will differ by the same number of modes, the matrix H^{ms} will contain several sub-matrices that completely consist of zeros. Take for instance the case that the compared function $k1$ is of a binary nature (yes-no).
In that case all sub-matrices $\left\{ h_{ij}^{k1s} \right\}_{s > s1}$ consist of zeros; only the top-most sub-matrix is filled.

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[56] Such functions can be specific aspects of product-market regulation, like the regulation aspects in Annex 2.

[57] Only the cases are interesting where $S < n$. Indeed if $S = n$ then all players have a different mode for dealing with function m and there is no point left in comparing qualitatively different modes.

Application to policy heterogeneity

We have applied the described heterogeneity to the database on economic policies of OECD member states developed by the OECD.[58] The complete dataset is developed on the basis of an extensive survey among the OECD member states. It contains some 1600 economic policy comparison items. About one-third of the comparison items present more than yes-no information, i.e. different "modes" in the terminology we developed earlier in this annex. The benchmark year for most of the data is 1997/1998. Figure A1 illustrates an example how the bilateral heterogeneity indicator is calculated.

Figure A1   An example for the calculation of the bilateral policy heterogeneity indicator

Regulation comparison item (function k)	Implementation mode (S)	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 b) Always c) Only firms in activity ..Y.. 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 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 b) Always c) Often d) Sometimes	Some-times	Always	1	2	0.67

Data selection

For our present analysis, many of the OECD comparison items are not relevant. The first step was to leave out all the non-EU countries except the US. The latter country is not only the EU's most important service trade and direct investment partner, but it also can be used for benchmarking.

Then we weed out most of the very specific sectoral comparison items. About half of the OECD comparison items are sector-specific. It contains hundreds of comparison items for network industries like electricity generation and distribution, telecommunication, airlines, banking, financial services, railways and other transport sub-sectors. Since the proposed EU directive does not deal with these sectors, we have deleted all except the most general comparison items.

[58] Cf. Nicoletti, Scarpetta and Boylaud (2000), Nicoletti (2003); Nicoletti, Golub *et al.* (2003); Golub (2003).

The database also contains many items with regard to the retail sector. Sometimes this information is very detailed like national regulations about shop-closing in weekends, or the presence of regulations regarding to holiday-closure. For retailing we only have preserved the comparison items of a more general nature.

We cut out a final large chunk from the remaining data by deleting some 200 very specific comparison items on national competition laws and regulations.[59] After this data selection we are left with 192 different items for assessing heterogeneity in economic policies of EU member states. Most of the remaining items are of a more or less general nature, or at least they can be considered as representative (*pars pro toto*) for a country's overall product market regulation approach.

Heterogeneity in EU product market regulation

The cleaned-up database is used for further analysis. In the case of comparison items that contain more than binary information, we develop an ordinal scale of maximally 6 coded grades (i.e. maximally 6 "modes" or $S = 6$) in which all country information for that particular comparison items could be ranked. We substitute the original country information for that item with the relevant coded grade. The result is a policy heterogeneity matrix of type H^{ms}; it can be used to derive how the EU member states differ among themselves in product market regulation. This is expressed by the country deviancy indicators $DV_i^{\ ms}$ of equation (A9). Table A1 presents the results for the EU member states.

Decomposing EU heterogeneity of product market regulation

Knowing that EU member states have heterogeneous economic policies is not enough for our analytical purposes. We specifically want to know how heterogeneous they are in those aspects of product market regulation that probably would be affected by the proposed EU directive on the Internal Market for services. Hence, the country deviancy indicators reported in Table A1 have to be decomposed.

For the decomposition we could use additional information in the OECD regulation database. Per comparison item, the OECD classified to which type of policy area it refers. This classification is based on the analytical approach developed in Nicoletti, Scarpetta and Boylaud (2000). The classification distinguishes main policy domains and sub-domains in a 4-layered hierarchy. We only use the 3 top layers of their classification. The subtotals indicate to what extent (much, somewhat, not) the comparison elements will be affected by the EU policy proposals (see chapter 3). The weights of the three subtotal categories are used for decomposing the effects of the measure on total policy heterogeneity.

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[59] As an example we take OECD database items no. 78-137: "Application and interpretation of the general competition law - May the conduct be found lawful, despite harm to competition, on the grounds of other policy considerations? Horizontal agreements: boycott". Similar specific questions are also asked for agreements like price fixing, market division, resale price control, vertical market controls.

Table A1 **Heterogeneity of product market regulation among EU member states, base year 1997**

	Den-mark	Gree-ce	Swe-den	UK	Aus-tria	Belg. -Luxem	Finland	France	Germ-any	Ireland	Italy	Nether-lands	Portu-gal	Spain	Czech Rep.	Poland	Hung-ary
Denmark	0.00	0.46	0.40	0.36	0.45	0.39	0.43	0.46	0.38	0.26	0.46	0.40	0.46	0.42	0.53	0.63	0.62
Greece		0.00	0.42	0.44	0.43	0.36	0.44	0.43	0.41	0.48	0.47	0.39	0.38	0.41	0.43	0.39	0.34
Sweden			0.00	0.34	0.48	0.39	0.47	0.43	0.39	0.32	0.49	0.32	0.51	0.45	0.48	0.54	0.43
UK				0.00	0.50	0.40	0.43	0.46	0.37	0.30	0.50	0.40	0.49	0.37	0.57	0.70	0.46
Austria					0.00	0.50	0.43	0.43	0.46	0.46	0.37	0.40	0.42	0.45	0.45	0.36	0.46
Belgium-Lux						0.00	0.38	0.35	0.39	0.43	0.45	0.34	0.42	0.37	0.52	0.50	0.44
Finland							0.00	0.41	0.41	0.45	0.44	0.32	0.42	0.43	0.45	0.45	0.41
France								0.00	0.43	0.43	0.37	0.34	0.42	0.48	0.46	0.45	0.45
Germany									0.00	0.32	0.43	0.37	0.39	0.40	0.48	0.57	0.48
Ireland										0.00	0.49	0.44	0.42	0.40	0.52	0.62	0.55
Italy											0.00	0.41	0.44	0.43	0.51	0.40	0.49
Netherlands												0.00	0.35	0.41	0.38	0.46	0.35
Portugal													0.00	0.44	0.44	0.43	0.39
Spain														0.00	0.53	0.53	0.43
Czech Republic															0.00	0.36	0.46
Poland																0.00	0.38
Hungary																	0.00

Country data are corrected for non-response or missing data.

Annex 2 Examples of policy items in the OECD regulatory database, by policy domain

Policy heterogeneity domain	More detailed elements of heterogeneity per item
State control	
* Do national, state or provincial government holds equity stakes in business company, in the following sector....	24 different sectors and business activities, like Gas manufacture and distribution, Communication, Insurance, Airlines, Support services for air, land or water transport.
* Share or number (in total employment of the business sector) of employees working in publicly-controlled firms with the following types of contracts: ...	Specific types of contracts (e.g. Tenured public employees), 5 answer categories: a=0-0.2; b=0.2-0.4; c=0.4-0.6; d=0.6-0.8; e=d 0.8-1)
Barriers to competition	
* Where laws or regulations restrict the number of competitors allowed to operate a business, which of the following selection procedures are used to	Specific items (e.g. assign state concessions), Answer categories: a=license; b= open tendering; c= single tendering; d= selective tendering
* Is it mandatory for suppliers interested in participating in public contracts to register as contractors or be qualified as such?	
* Do national, state or provincial laws or other regulations restrict in at least some markets the number of competitors allowed to operate a business, in the following sector	24 different sectors (e.g. Urban, suburban and interurban highway passenger transport, Electricity, Business services, Financial Services, and Motion picture distribution and projection)
* How frequently the following criteria are applied in the awarding of state concessions or franchises: .... ?	Specific items (e.g. allocation to bidder who offers best service at lowest prices), answer categories: B=never; C=sometimes; D=often; E=always
* Are there restrictions (other than capital and technical requirements) on participation in the public tendering procedures?	Answer categories: B=never; C=sometimes; D=often; E=always
* Do these include restrictions based on nationality or residence?	Answer categories: A=Country is not concerned by the question; B=in some sectors; C=never
* Exemption grounds for permitting otherwise illegal mergers	5 specific questions
* Legal condition of entry in	Specific domains (e.g. Telecommunications /basic voice/international), answers: A=Open; B= licensed
* Retail distribution: What is the threshold surface limit for (..*specific*...) laws or regulations to apply?	Specific domains, answer categories: A=under 250m2; B=250-500m2; C=500-1000m2; D = 1000-2000m2; E=above 2000m2
* Retail distribution: Are professional bodies or representatives of trade and commercial interests involved in (... *specific..*) licensing decisions?	Specific items
* Please indicate (if possible) the share of public procurement by central government entities assigned through open tendering procedures :	Specific sectors (e.g. services), Answer categories: A=0-25; B=25-50; C=50-75; D=75-100

Table A2 Examples of policy items in the OECD regulatory database, by policy domain (continued)

* Is there an administrative monitoring mechanism checking
compliance with public procurement tendering rules at all
government levels?

Regulatory and administrative opacity

* Does government policy impose specific requirements in relation to the following aspects of regulatory quality assurance: ..... ?	Specific issues (e.g. Transparency/freedom of information), answer categories: A=government-wide; B= in some sectors; C=No
* Are there systematic procedures for making regulations known and accessible to affected parties?	
* Do affected parties have the right to appeal against adverse enforcement decisions in individual cases?	Answer categories: A=in all cases; B=in some cases; C=no
* Are there single contact points for getting information on licenses and notifications ?	

Explicit barriers to Trade

* Are they any specific provisions which require that regulations be published to the public at the international level?	
* Are appeal procedures available to foreign parties?	
* When business practices are perceived to restrict competition and hence prevent effective access of foreign firms (foreign owned or controlled) to such markets, can the latter have redress: Through ... ?	4 specific questions (e.g. through competition agencies, through trade policy bodies)

Administrative Barriers on Start-ups

* Retail distribution: Procedures pertaining to the establishment of new outlets for selling food : ...	Specific issues, e.g. Registration in commercial register
* Road freight : In order to ...... do you need to obtain a license (other than a driving license) or permit from the government or a regulatory agency ?	Specific issues, e.g. operate a national road freight business
* Retail distribution: Procedures pertaining to the establishment of new outlets for selling food : ...	Specific issues, e.g. Licenses or permits needed for outlet siting
* Retail distribution : What are the minimum requirements for registration :....	Specific requirements, e.g. Management or professional record/degree
* Retail distribution : Does the registration office have statutory deadlines for approving and/or confirming registration?	
* Retail distribution : In the case of this hypermarket : How many levels of government would be involved in the application and licensing procedures?	Answer categories: A=0; B=1; C=2-5; D=above 5
* Enterprise creation : Maximum number of procedures (pre & post): corporation	Answer categories: A=0-5; B=5-10;C=10-20;D=above 20
* Enterprise creation : direct and indirect cost (minimum ECU): corporation	Answer categories: A=0-1000; B=1000-2000; C=2000-3000;D=above 3000
* Enterprise creation : minimum capital requirements (minimum ECU): corporation	Answer categories: A=under 10000; B=10000-25000; C=25000-50000; D=50000-75000; E=above 75000

Annex 3: Data transformation with DM method

The regression results in Chapters 4 and 5 are obtained from reduced form equations for bilateral FDI stocks, and service exports. In the case of FDI stock the approach is cross-section, while for service trade regressions we use data for three years. In bilateral equations, and certainly with panel data, one should control for unobserved factors that are specific to each country, each partner, each country-partner pair and each period, as well as for shocks that are common to all countries over time. The problem in our case is that estimating dummies for all these factors is not viable, due to an excessive loss of degrees of freedom. In the case of the FDI regressions this would require the introduction of 170 dummy variables, and 165 for service trade. Such an excessive loss of degrees of freedom prevents us from including dummies for all country-partner pairs. We solve this problem by transforming variables as deviations from their mean (hence the abbreviation: DM).[60] For each destination country it focuses on the differences between origin countries, and for each origin country it assesses the differences between destination countries. In this way two equations for bilateral exports are obtained: an "origin" equation; and a "destination" equation. The "origin" equation expresses all variables as deviations from their values for the average origin (=export) country. If variable Z_{kj} is a bilateral variable of equation (5.1) the variables of the 'origin' equation read as:

$$\Delta_k Z_{kj} = Z_{kj} - \frac{1}{I} \sum_{i=1}^{I} Z_{ij} \tag{A3.1}$$

in which I and J represent the number of countries for origin and destination. If Z represents exports from country k to j the transformed variable $\Delta_k Z_{kj}$ indicates the exports of country k to country j in deviation of the average exports to country j. Similarly, the "destination" equation expresses bilateral imports and all explanatory variables as deviations from their values for the average destination (=import) country:

$$\Delta_m Z_{im} = Z_{im} - \frac{1}{J} \sum_{j=1}^{J} Z_{ij} \tag{A3.2}$$

After transforming all bilateral variables in this way, we estimate the two equations simultaneously by the full-information maximum likelihood (FIML) procedure. The advantage of the transformed variables is that the origin-specific unobserved effects are accounted for in the origin equation. At the same time we can add explicit country-dummies to take account of the unobserved effects for the destination countries. Similarly, in the destination equations the destination-specific unobserved effects are accounted for by the transformation, and the origin-

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[60] It is a "within" fixed-effect estimator (cf. Verbeek 2004). In many cases the within estimator gives identical results as for estimating the non-transformed equation with dummies. In this case not, because of the bilateral variables. The method is introduced for bilateral trade by Erkel-Rousse and Mirza (2002). They call the method "transformed least squares".

specific unobserved effects are evaluated by adding explicit country-dummies. Additional degrees of freedom are gained by assuming that in each of the two equations the incremental information provided by the unobserved country-pair effect over the "pure" origin (or destination) effect is random, and can be included in the error term.[61] In the origin and destination equation we impose identical coefficients for the year dummies, and for those variables that express bilateral differences: physical distance, language distance, and regulatory heterogeneity.

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[61] Thus assuming that the deviations of bilateral fixed effects from their means are i.i.d. random terms.

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