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The European Union's service directive: Contrasting *ex ante* estimates with empirical evidence

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Abstract

One of the top priorities to improve the European Union's growth performance is the creation of a single market for services. The directive on services adopted by the Parliament and the Council by the end of 2006 aims at removing barriers to the free movement of service providers on the internal market. Previous studies quantified *ex ante* sizable effects of implementing the directive in its original form. This paper is a first attempt to evaluate *ex post* the trade effects induced by a directive - which excludes the country-of-origin principle - by performing a *difference-in-difference-(in-differences)* estimator on a sample of EU- and non-EU countries in the period 2004 to 2010. We account for non-tariff trade barriers and the endogeneity of regional trade agreements and find that deregulations foster a deeper integration of the new member states into the European value-added-chain and promote business service exports from third countries towards the EU. The reorientation of the new members is in turn associated with declining intra-EU10 business intensities while leaving business trade among the entire members largely unaffected.

Keywords: service directive, non-tariff barriers, outsourcing, internal market, EU
JEL-classification: F12, F15, L84

Abbreviations

ABS	Administrative burdens on start-ups (PMR)
BC	Barriers to competition (PMR)
BTI	Barriers to trade and investment (PMR)
BUSEX	Business services exports
CEEC	Central and Eastern European Countries
CGE	Computational General Equilibrium
CM	Common Market
COMEX	Commercial service exports
CoOP	Country of Origin Principle
CU	Customs Union
DD	Difference-in-Differences estimator
DDD	Difference-in-Difference-in-Differences estimator
EC	European Community
EEC	European Economic Community
EFTA	European Free Trade Association
EIA	Economic Integration Agreement
EU	European Union
FTA	Free Trade Agreement
GATS	General Agreement on Trade in Services
IBO	Involvement in business operations (PMR)
$LIB_{t_}$*	Liberalization of (regulation) in the current period (2003 to 2008)
$LIB_{t-1_}$*	Liberalization of (regulation) in the past period (1998 to 2003)
MU	Monetary Union
NAFTA	North American Free Trade Agreement
NTB	Non-tariff trade barrier
OECD	Organization for Economic Co-operation and Development
PMR	Product market regulation indicator
PO	Public ownership (PMR)
PROF	Professional services (PMR)
PROF-C	Professional services conduct regulation (PMR)
PROF-E	Professional services entry regulation (PMR)
PTA	Preferential Trade Agreement
RAO	Regulatory and administrative opacity (PMR)
RTA	Regional Trade Agreement
SC	State control (PMR)
WTO	World Trade Organization

1 Introduction

"The greatest asset of the European Union is undoubtedly its internal market" (Pelkmans 2007:1). Along with the enlargement of the European Union (EU) by integrating the new member states in 2004 the internal market for goods and capital gets finalized. However, attempts have been made to deepening market integration for services in the EU. A comprehensive report by the European Commission (COM 2002) on administrative and regulatory barriers in the member states was a starting point for a proposal for a Directive (COM 2004) in 2004. The proposed EU directive, also known as the *Bolkestein* draft, builds upon the *freedom of establishment* and *free movement* of service providers in the internal market. The proposed measures in the directive should force EU member countries to simplify their administrative regulation, eliminate restrictive regulations that impede service trade, evaluate a number of requirements and justify the regulations' compatibility with the EU directive. Most of the measures ought to result in a lower level of regulation. The key element to facilitate the free movement and cross-border provision of service is the country-of-origin principle (CoOP in Article 16) according to which service providers are solely subject to the national provisions (i.e. law and regulation) of their home country when delivering services elsewhere in the internal market. The second element to foster the free establishment of service providers (intra-EU FDI) is based on the concept of non-discrimination between nationals of the EU member states when granting authorization to supply services. The proposed directive should apply to all economic services and excludes non-economic services of social and cultural interests, publicly financed services and services which belong to separate regulations; especially financial and banking services (Article 2). However, after an intensive debate in the member states and in the European Parliament a final version (COM 2006) was adopted in December 2006.[1] With this directive, two significant changes have occurred. First and most important, the CoOP, which was the central point on which the *Bolkestein* draft was build, was fully removed from the final version of the directive. And second, Article 2 in the final directive includes a long list of further exceptions. As a result, commercial services sectors subject to the directive (and the focus of this paper) are construction services, computer and information services, and other business services (leasing, legal, accounting, management and public relations services, advertising, architectural, engineering and other technical consultancy services and research and development).

However, a number of good reasons may require regulating specific services sectors in the economy. Some regulations of services sectors reflect the concerns to ensure the quality of services (e.g. licensing and qualification requirements for professionals), to maintain standards (e.g. safety standards in the transport sector), and to protect consumers in the circumstance of asymmetric information (e.g. residency requirements enhance consumers'

[1] See Pelkmans (2007), De Witte (2007) and Messerlin (2005) for a discussion of the political process.

redress in the case of malpractice).[2] However, too much regulation can be restrictive and impede service trade, reduce competition with the consequence of increasing prices (McGuire 2008). In some services sectors (i.e. network sectors) regulation is necessary to increase competition and achieve optimal outcomes. The debate among researchers focuses on removing the CoOP from the directive which aimed at introducing competition among national regulatory systems in the EU.[3] The existence of different national regulatory systems can hamper intra-EU services trade but a removal of the national regulation can extend existing market failures from the national level to the internal market (Lammers 2010, Sinn 1997).[4] The consequence of not allowing service provision under the CoOP principle – now visible in Article 16 of the final directive - add nothing to the treaty of Rome in 1958 on establishing the European Economic Community (Pelkmans, 2007). The elementary principles "non-discrimination against nationality", "necessity of required regulation", and "proportionality to attain the objective" now restate the application of the case law by the European Court of Justice to decide whether the objectives of the relevant laws of both countries are "equivalent".

Nevertheless, empirical studies that quantify *ex ante* the impact of the service directive on intra-EU trade and FDI report sizable effects although significantly lower when excluding the CoOP. The estimates build upon the idea of removing heterogeneity in member countries' regulation but neglect trade diverting effects in the European Union's trade with the rest of the world. Since the seminal paper by Viner (1950) it is known that any regional trade agreement is causing a combination of trade creating and trade diverting effects. Trade economists investigating the effect of service trade agreements by including a dummy on free trade agreements (FTA) find mixed results. The shortcoming is certainly that they miss to account for the regulatory nature of trade barriers in service sectors compared to merchandise trade. In this paper, we evaluate *ex post* the (short term) trade effects of the service directive by performing a *difference-in difference (-in-differences)* estimator on a subset of commercial- and specialized business services trade (which remain in the final directive) accounting for liberalization of non-tariff trade barriers and the endogeneity bias of free trade agreements.

The paper is structured as follows. Section 2 surveys the literature and presents *ex ante* estimates of the service directive. Section 3 sets out the empirical strategy, data limitations and descriptive statistics. The empirical evidence and robustness checks will be discussed in Section 4. The last section concludes the paper.

[2] See OECD (1997) and OECD (1996) for professional services. An overview is provided by Nguyen-Hong (2000).
[3] Glismann and Schrader (2008) argue that the entire proposal is already born with the substantial institutional failure of excluding the free movement of temporary workers by keeping the posting of workers directive (COM 1996). See also Bertola and Mola (2010) for a discussion on temporary mobility of workers in the EU.
[4] Meanwhile, a part of the discussion is centred on the question whether regulatory competition leads to a "race to the bottom" or a "race to the top". See Kerber and Van den Berg (2008).

2 Literature Review

In the literature a common understanding exist on the macroeconomic effects of implementing the service directive aiming at lowering regulatory barriers in (selected) services sectors. From a theoretical perspective, extending the (functioning of the) internal market to service industries is supposed to have no direct effect on GDP growth and employment, rather indirect effects occur via intra-EU trade and FDI. The productivity increase induced by lowering service trade barriers is translated through three main channels (Badinger and Maydell 2009): economies of scale, international specialisation according to comparative advantage, and knowledge and technology diffusion. Lowering trade barriers reduces entry costs for foreign firms which leads to higher competition, and in turn increases productivity by lowering prices and enabling a more efficient allocation of resources (allocative efficiency). Competitive pressure forces firms to organize production steps more efficiently and increases gains from increasing returns to scale (productive efficiency). Finally, international competition increases firms' incentives to invest in R&D activities resulting in technical progress (dynamic efficiency).[5] Up to date, several studies have quantified *ex ante* the potential impact of the service directive in the European Unions' internal market. Three streams of literature emerged soon after the first proposal (COM 2004). The first one concentrates on the potential impact of the proposed directive on intra-EU trade and FDI. The second stream makes either use of computational general equilibrium (CGE) models simulating the welfare effects of the service directive or estimates the trade-induced effects of the directive on macroeconomic performance in a partial equilibrium model. A third stream of literature quantifies the effects of removing the CoOP from the directive.

Kox, Lejour and Montizaan (2005) investigate the argument that the heterogeneity of regulation across EU countries impedes the free movement of services. They develop a heterogeneity index of regulation based on the OECDs database on product market regulation (PMR) and identify per comparison whether each regulatory item is affected by the proposed directive or not. According to the first column of table 1, implementing the proposed directive would lead to the highest reduction in regulatory heterogeneity in *barriers to trade and investment* (*BTI*) and *regulatory and administrative opacity* (*RAO*) while moderate effects are expected for heterogeneity reduction in *administrative burdens on start-ups* (*ABS*) and *barriers to competition* (*BC*). However, the gravity model estimates on the intra-EU trade effects of regulatory heterogeneity (in column 4) are based on a sample of 9 EU countries in the period 1999 to 2001 and reveal that only reducing heterogeneity in *barriers to competition* (*BC*) and *barriers to trade and investment* (*BTI*) lead to significant positive trade effects.[6] Simulated trade effects of the proposed EU directive (column 6 builds upon column 1 and 4) suggest an increase in intra-EU

[5] Griffith and Harrison (2004) and Nicodème and Sauner-Leroy (2007) provide a detailed overview on transmission channels. See Kox and Lejour (2006a) on long term dynamic effects of liberalizing services markets.
[6] The new member states are not considered. The benchmark year for OECD regulatory indicators is 1997/1998.

commercial service trade by 44 per cent (mainly driven by *barriers to competition BC)*. As the final version of directive (COM 2006) deviates considerably from the entire proposal, Weber and Asmus (2008) recalculate the impact of the service directive with the updated 2003-version of the PMR-database. Besides the trade effects of *regulatory and administrative opacity* (RAO) leading to a reduction of heterogeneity in barriers from 80 to 90 per cent they find contrary results. According to column 2, implementing the (final) directive will not affect *barriers to competition (BC)* and a modest effect is expected for *barriers to trade and investment (BTI)* and *administrative burdens on start-ups (ABS)*. The preferred gravity model (column 5) estimates the trade effects of regulatory heterogeneity – which is based on a sample of 9 EU countries in the period 2001 to 2003 - reveal that most of the trade effects stem from regulatory heterogeneity in *barriers to trade and investment (BTI)* and the state's *involvement in business operations* (IBO). More interestingly, from the positive parameter estimates they conclude that the (final) directive are expected to lead to declining service trade volumes by around 2.2 to 7.9 per cent.[7]

Table 1: Ex ante evaluation of the EU service directive

	Reduction in heterogeneity (%)			Parameter Estimates (trade flows)		Simulated effect on trade (min to max/ central)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sub-index	KLM (2005)	WA (2008)	BKL (2006)	KLM (2005)	WA (2008)	KLM (2005)	WA (2008)	BKL (2006)
RAO	66-77	79-91	39-45	-0.23 (0.33)	-0.09 (0.69)	No effect	2 to 2.3	No effect
BTI	73-78	17	41-45	-0.86*** (0.30)	0.62* (0.06)	5 to 11 /8	-2.5	4 (-4)
ABS	34-46	0-15	34-45	0.35 (0.36)	-0.25 (0.37)	No effect	0 to 1.4	No effect
BC	29-37	0	19-25	-3.10*** (0.55)	-0.26 (0.49)	25 to 51 /36	No effect	23 (-13)
SC	3-6	-	3-6	0.74 (0.58)	-	No effect	-	No effect
PO	-	11	-		0.49 (0.14)	-	-1.6	-
IBO	-	0-23	-		1.00*** (0.00)	-	0 to -7.5	-
Overall PMR	31-38	11-19	22-27	-	-	30 to 62 /44	-2.2 to -7.9	19 to 38 /28

Note: sub-indicators represent regulatory and administrative opacity (RAO), explicit barriers to trade and investment (BTI), administrative burdens on start-ups (ABS), barriers to competition (BC), state control (SC), public ownership (PO), and involvement in business operations (IBO).
Source: Kox, Lejour and Montizaan (2005) (KLM), table 3.4, table 4.3 (last column, std.error in parenthesis) and table 4.4. Bruijn, Kox and Lejour (2006) (BKL), table 2.3, table 2.4 and table 2.5. Weber and Asmus (2008) (WA), table 4, table 5 (period 2001-2003, p-value in parenthesis) and table 6.

In a follow-up study, De Bruijn, Kox and Lejour (2006) evaluate the expected impact of removing the CoOP from the directive on heterogeneity reduction (column 3). Based on the parameter estimates (in column 4) they find that intra-EU commercial service trade will

[7] It remains unclear whether the negative effect is the outcome of removing the CoOP. However, results are not robust, i.e. overall positive trade effects (by around 20 per cent) are reported for the period 1999 to 2001.

increase by 28 per cent (last column) and argue that the CoOP accounts for one third of the total increase caused by full implementation of the directive. The CoOP plays an important role in fostering the free movement of service providers in the internal market with strong trade effects stemming from heterogeneity reduction in *barriers to trade and investment (BTI)* and *barriers to competition (BC)*. However, it is argued that the CoOP hardly affects *state control* (as network sectors are excluded from the directive) and *administrative burdens on start-ups* (as the CoOP does not apply to the establishment of new firms).

Furthermore, CGE trade models are calibrated with the parameter estimates in order to simulate the trade-induced welfare effects of the service directive (Gerlauff and Lejour 2006, De Bruin, Kox and Lejour 2006,2008).[8] In general, the static gains of implementing the directive derived by CGE modelling - intra-EU GDP effects range between 0.2 and 0.7 per cent, and employment effects range between 0.3 and 1.1 per cent - depend on underlying assumptions of the model: higher effects are obtained in the monopolistic competition model and with increasing returns to scale while lower effects result from perfect competition models (Gerlauff and Lejour 2006; De Bruijn, Kox and Lejour 2006,2008; Copenhagen Economics 2005a; Bajo-Rubio and Gomez-Plana 2005; O'Toole 2005). With the CoOP excluded from the directive, simulated GDP effects will be reduced by one tenth (when FDI-induced effects are accounted for) to one third (compare De Bruijn, Kox and Lejour 2006, 2008; Copenhagen Economics 2005b, Badinger et al. 2008).[9] At the country level, most of the models predict that relatively small countries (e.g. Ireland, Benelux, Denmark, Sweden, Finland) and the new member states (Czech Republic, Hungary, Poland, Slovakia and Slovenia) will experience the largest increase in exports of commercial services (Gerlauff and Lejour 2006, De Bruijn, Kox and Lejour 2006,2008; O'Toole 2005). In addition, De Bruijn, Kox and Lejour (2006, 2008) argue that although commercial services will contribute to a larger extent to the new members' export bundle, it is expected that value added in services decrease as they will further specialize in manufacturing production.

Breuss and Badinger (2005, 2006) and Badinger et al. (2008) investigate the argument that the main channel through which the directive affects macroeconomic performance (productivity, employment and investment) is an increase in competition. They estimate the transmission channels of trade and FDI in a sample of covered service sectors for eleven EU member states in the period 1978 to 2002 and combine the parameter estimates with the estimated regulatory heterogeneity reduction from Kox, Lejour and Montizaan (2005). A reduction in mark-ups following the competitive pressure lead to contrary results at the country-level: Small countries (Belgium, Netherlands, Ireland, Sweden, and the UK)

[8] The model calibration is based on converting service barriers into tariff equivalents such that the outcome of the models by 2040 is the parameter estimate on commercial service trade.
[9] Jensen et al. (2004) suggest that welfare effects of service trade liberalization through FDI are larger than through trade (accounting for 70-80 per cent of the total effects).

will rather gain less than EU average.[10] Simulations by O'Toole (2005) suggest that creating a single market for services by lowering barriers will result in trade diversion from suppliers outside Europe.

Since the seminal paper by Viner (1950) it is well known that the impact of any regional trade agreement is a combination of trade creation (low cost member countries replace high cost domestic producers) and trade diversion effects (members reorient their trade from low-cost non-members towards high-cost member countries). Earlier studies on goods trade include a binary dummy for free trade agreements (FTA) and find significant positive trade creation effects of the European Economic Community (EEC) agreement (e.g. Aitken 1973, Thursby and Thursby 1987), in Asia and North America (Frankel and Wei 1993) and in Latin America (Soloaga and Winters 2001). Other studies found insignificant trade effects (Bergstrand 1985) or even negative effects (Frankel 1997). Ghosh and Yamarik (2004a), performing extreme bound analysis, find "fragile" trade creating effect of most FTAs. Similarly, evaluations of the integration of services markets lead to mixed results: Grünfeld and Moxnes (2003) and Walsh (2003) report insignificant coefficients on the FTA- and EU dummy for total services and argue that most FTAs do not cover services explicitly. Kimura and Lee (2006) as well as Ceglowski (2006) find positive effects of various FTAs on service trade which is argued to reflect rather the impact of goods trade. Dettmer (2011) finds that specialized business services trade is enhanced by concluding a service-FTA (which explicitly cover service according to GATS Article V) but deteriorate for members of the EU27, while commercial service is largely unaffected by concluding any service trade agreement. However, Baier and Bergstrand (2004) and Magee (2003) argue that forming a FTA is determined by economic and political factors such that self-selection into FTAs occurs. Only a few studies address this endogeneity bias and conclude that overall trade effects among member states of a FTA are positive (Baier and Bergstrand 2007; Serlenga and Shin 2007; Magee 2003, Egger et al. 2008). Caporale et al. (2009) focusing on the enlargement of the EU find clear evidence that members of EU15 and Central and Eastern European countries (CEEC-4) signing the association agreement increase goods trade among themselves instead with countries that are not part of the agreement. Baier and Bergstrand (2009) testify trade diverting effects among the original EU members in the period 1970 to 1980 (when Denmark, Ireland and the UK entered and the EC signed a FTA with the European Free Trade Association (EFTA)) and in the period 1990 to 1995 (when FTA are created with CEECs). Kandogan (2009) confirms the trade diverting effects from signing agreements with CEEC and the Southern Mediterranean countries. He finds that EU partners in these agreements experience trade diversion (with non-members) especially in resource- and labor-intensive sectors in the first half of the 1990s. Similar results for the

[10] See Badinger and Breuss (2006) for an evaluation of the Casella (1996) argument of large- vs. small country bonus from trade integration in the European Union. The empirical literature is silent on the distribution of gains from services trade integration, and on the assumption of CGE models which seem to incorporate the small country bonus. Theoretically, the large country bonus arises from the existence of economies of scale, larger product varieties and the relevance of absolute factor endowments making large countries more competitive to exploit tariff removal or deregulation in the internal market than small countries.

EU are found by Magee (2008), Soloaga and Winters (2001), and Sapir (2001). Freund and Ornelas (2010) surveys the literature on this issue and conclude that trade diversion is not a major issue, although it matters in some agreements and some industrial sectors. However, the opening up of Eastern Europe in 1989 prompted a new field of research quantifying the trade potential for east-west trade in the case of EU enlargement. Accordingly, the trade liberalization agreements with the EU in the early nineties led to a reorientation of CEEC goods trade from the former Soviet Union towards the EU and a predicted decline in intra-CEECs trade (Wang and Winters 1991, Hamilton and Winters 1992, Baldwin 1994, Breuss and Egger 1999). Laaser and Schrader (2006) and Laaser, Schrader, Heid (2007) evaluate ex post the changing trade pattern of the Baltic States and the Visegrad-countries (Czech Republic, Hungary, Poland, and Slovakia) and find that trade integration with Europe has not caused a total stop of trade flows towards the CIS countries. Rather, the new member states upgrade the technology content of their export bundle and tend to build a bridge between the western markets and their former integration partners. In a recent paper, Baldwin (2011) challenges the Vinerian view on trade creation and trade diversion (which is based on tariff analysis) being not appropriate to explain the 21st century regionalism and the trade-investment-service nexus (presence of non-tariff trade barriers (NTBs)). In this line, most recent research concentrates on the deepness of integration agreements and whether they include reduction of NTBs. Ghosh and Yamarik (2004b) investigate the argument that differences in the degree of integration determine the trade creating potential and suggest that members of a trading bloc conduct more trade (inside and outside the bloc) the deeper integrated the RTA.[11] In contrast, Baier et al. (2008) provide evidence on Economic Integration Agreements (EIA) and find trade creating effects of the EU, EFTA and other agreements of which the coefficients are rather similar in size. Given the lack of theory predicting that FTA enhances trade more than a CU, Vicard (2009) confirms that the average treatment effects of all FTA-types are statistically similar. A similar attempt has been made to account for the *depth* of FTAs which incorporate services. Marchetti (2009) classify three types of recent service negotiations and is in line with Vicard (2009): he finds trade creating effects of around 12 per cent on average in the period 1999-2006 for service trade agreements in general and effects of similar size when distinguishing into service-FTAs and the EU internal market.[12] In contrast, Guillin (2011) finds that only EIA make total service trade grow by 32 per cent on average in the period 1999-2007 while all other service negotiations resulting in PTAs, FTAs and CUs (except the EU) do not significantly affect bilateral service trade. Shingal (2009) finds rather a negative trade effect (although insignificant) of EU's internal market strategy. In addition, the trade effects of service-FTAs depend on the countries' level of development such that only North-

[11] Balassa (1961) initially introduces the taxonomy of trade agreements considering the gradual process of regional integration through free trade agreements (FTA), customs union (CU), common market (CM) and monetary union (MU).

[12] Distinction is made into simple PTAs (GATS-type gradual approach), the NAFTA-type agreements (which include a "ratchet mechanism" to hinder parties making non-tariff trade barriers more restrictive) and the deeper integration agreements of the EU-type (which seek some kind of harmonization of basic regulatory requirements).

North trade agreements between developed countries lead to increasing service trade while any service agreement with a developing country has no impact.[13] The evidence on the depth issue of service market integration so far presents no conclusive results. One shortcoming of transferring the FTA-approach in merchandise trade to the service sector is certainly that the dummy misses to account for the regulatory nature of service trade barriers. The RTA dummy in merchandise trade is aimed to capture the removal of tariff rates following trade negotiations to some extent. Services, in contrast to goods, are rather subject to non-tariff barriers and by far more regulated behind the border. In the last decade when services become even more tradable, several attempts have been made to quantify restrictions on services delivery and to evaluate their impact on service trade.[14] In general, the restriction on services can be classified in two ways which correspond to classification in the GATS schedules of commitments (McGuire 2008). First, restriction applies to *establishment* (e.g. licensing requirements limit the ability to establish a firm and correspond to GATS mode 3 (commercial presence)) or the restriction applies to *ongoing operations* (e.g. pricing of services limit the ability to operate in the market and corresponds to mode 1 (cross-border trade), 2 (consumption abroad) and 4 (presence of natural persons)). A second classification distinguishes services restrictions into *non-discriminatory* (GATS limitations on market access) and *discriminatory* (GATS limitation on national treatment). However, recent evaluations on the trade effects of non-tariff trade barriers in the service sector estimate the gravity model and find a negative correlation between the level of regulatory indicators and bilateral trade in services (OECD 2009, Grosso and Shepherd 2008, Schwellnus, 2007; Mirza and Nicoletti 2004, Nicoletti et al. 2003).[15]

Thus, a proper *ex-post* evaluation of the trade effects of the service directive need to account for trade creation and trade diversion as suggested by Viner (1950) as well as non-tariff trade barriers in services sectors (or liberalization thereof). This paper is a first attempt to quantify *ex post* the (short term) trade effects of the EU's service directive by using a difference-in-difference-in differences approach.

3 Empirical Strategy and Data

The aim of the service directive (COM 2006), published at the end of 2006 in the official journal of the European Union, is to enhance bilateral service trade between member states of the European Union in targeted services sectors. As we are interested in the causal effect of the services directive on bilateral trade within the EU we use a difference-in-difference-

[13] Ghosh and Yamarik (2004b) argue that higher mean tariff rates in developing countries may explain that rather developing countries experience enormous trade creating effects from concluding any type of goods RTA.
[14] Nielson and Taglioni (2003) provide an extensive literature review on sector studies trying to quantify restrictions in several services sectors. See also Banga (2005) for an overview on measuring service trade barriers.
[15] Schiantarelli (2010) reviews the cross-country evidence on the effect of product market regulation on macroeconomic outcomes.

in-difference (DDD) estimator implemented in the gravity framework.[16] The gravity model is the workhorse model in international trade and a common methodology to investigate the trade effects of regional trade agreements. Introduced by Tinbergen (1962), the gravity model relates trade between any two countries to their economic size and inversely to the distance between them. Theoretical foundations of the empirical gravity equation can be found in Eaton and Kortum (2002) who build the gravity equation on models with homogeneous products and heterogeneity in productivity. Anderson and van Wincoop (2003) show that the gravity equation is also compatible with theoretical trade models on product differentiation by the country of origin. Krugman's (1980) model of monopolistic competition builds on a similar argument. The monopolistic competition model gives a theoretical foundation for augmenting the gravity equation with regulation indicators as it describes a link between entry barriers and trade. In this respect, product differentiation, economies of scale and especially barriers to entry are relevant characteristics of services markets in the EU (COM 2002). We focus only on those services sectors targeted by the services directive using a *difference-in-differences (DD)* approach formulated as follows:

$$\ln EXP_{ijt} = \beta_0 + \beta_1 D_{ij=EU} + \delta_0 D_{Time} + \delta_1 D_{ij=EU} * D_{Time} + \beta_k \sum_{k=1}^{K} D_{kij} + \beta_l \sum_{l=1}^{L} X_{lt} + \gamma_{ij} + \gamma_t + \varepsilon_{ijt} \quad (1)$$

The dependent variable, $\ln EXP_{ijt}$, is the log of nominal commercial (COMEX)- or business services (BUSEX) exports from country *i* to country *j* at time *t*. The variable $D_{ij=EU}$ represents a dummy which is equal to one if both the reporter *i* and the partner country *j* is a member of the EU25 (*intraEU25*). We also split intra-EU25 trade into subgroups of trade within the entire EU15 (*intraEU15*), within the new member states (*intraEU10*) which join the European Union in the year 2004 and trade between both EU subgroups (*interEU*). The dummy variable D_{Time} is equal to one for the years 2007 to 2010 after the adoption of the EU service directive and zero for the period before. While the coefficient on the EU-dummy measures the difference between intra-EU trade and trade in the control group in the pre period $\beta_1 = E[EXP_{ijt} \mid EU = 1, t = 0] - E[EXP_{ijt} \mid EU = 0, t = 0]$, the coefficient on the time dummy indicates differences in service trade in the pre and post period for country pairs in the control group, $\delta_0 = E[EXP_{ijt} \mid EU = 0, t = 1] - E[EXP_{ijt} \mid EU = 0, t = 0]$. The difference-in-differences estimator is the interaction term $D_{ij=EU} * D_{Time}$ and measures the effect of the services directive on intra-EU trade flows. The coefficient of interest, δ_1, can be expressed as:

$$\delta_1 = \left\{ E[EXP_{ijt} \mid EU = 1, t = 1] - E[EXP_{ijt} \mid EU = 1, t = 0] \right\} - \left\{ E[EXP_{ijt} \mid EU = 0, t = 1] - E[EXP_{ijt} \mid EU = 0, t = 0] \right\}$$

[16] The difference-in-difference approach is a common methodology to evaluate policy changes on outcome (Imbens and Wooldridge 2007, Angrist and Pischke 2009). Falck, Heblich and Kipar (2010) apply the DDD-estimation to the Bavarian High Tech Offensive. Renaud (2008) perform DD estimator to evaluate the effect of workers codetermination on firm performance. The DD estimator has previously been applied by Slaugther (2001), Álvarez and López (2008) and Giavazzi and Tabellini (2005) to the effect of trade liberalization on income convergence and economic (or firm) performance.

and compares intra-EU services trade before and after the adoption of the services directive to service trade of country pairs in the control group before and after the directive. Standard gravity variables related to geographical distance between reporter and partner country and bilateral dummies for sharing a common border and a common official language are included in D_{kij} . Variables in X_{lt} contain market size of the reporter and partner country (measured by nominal GDP) in the respective years.

One shortcoming of performing the difference-in-differences (DD) approach is that it focuses on intra-EU trade before and after the directive but does not account for liberalization of non-tariff trade barriers in services sectors which may affect the trade pattern across all countries. We account for the liberalization of service regulation induced by the directive and consider a control group within the EU which lead to a *difference-in-difference-in-differences (DDD)* estimator. The first difference is identified by different service trade patterns of countries over time, i.e. before and after the directive. The second difference measures different service trade pattern of all EU countries (treated to the directive) compared to non-EU countries. The third difference is related to difference of service trade pattern between liberalizing and non-liberalizing countries within the EU. Thus, to find out whether the intra-EU trade effect of the service directive (treated EU countries after the introduction of the directive) is due to liberalization of restrictions in services, the *Difference-in-Difference-in-Differences (DDD)* approach can be formulated as follows:

$$\begin{aligned}\ln EXP_{ijt} = {} & \beta_0 + \beta_1 D_{ij=EU} + \beta_2 D_{ij=LIB} + \beta_3 D_{ij=EU} * D_{ij=LIB} + \delta_0 D_{Time} + \delta_1 D_{Time} * D_{ij=EU} \\ & + \delta_2 D_{Time} * D_{ij=LIB} + \delta_3 D_{ij=EU} * D_{Time} * D_{ij=LIB} + \beta_k \sum_{k=1}^{K} D_{kij} + \beta_l \sum_{l=1}^{L} X_{lt} + \gamma_{ij} + \gamma_t + \varepsilon_{ijt}\end{aligned} \tag{2}$$

In addition to the EU-dummy and the dummy for the time (before and after the services directive) we include a dummy which is equal to one for a country pair liberalizing regulation in services sectors and zero otherwise. In this model, the difference-in-difference-in-differences (DDD) estimator is the coefficient on the interaction term $D_{ij=EU} * D_{Time} * D_{ij=LIB}$ and measures the effect of the services directive on intra-EU trade flows for country pairs in the EU which liberalize their regulation on services markets. Thus, the coefficient of interests, δ_3, can be expressed as

$$\begin{aligned}\delta_3 = {} & \left\{E[EXP_{ijt} \mid EU=1, t=1, LIB=1] - E[EXP_{ijt} \mid EU=1, t=0, LIB=1]\right\} \\ & - \left\{E[EXP_{ijt} \mid EU=1, t=1, LIB=0] - E[EXP_{ijt} \mid EU=1, t=0, LIB=0]\right\} \\ & - \left\{E[EXP_{ijt} \mid EU=0, t=1, LIB=1] - E[EXP_{ijt} \mid EU=0, t=0, LIB=1]\right\}\end{aligned}$$

and compares intra-EU trade of liberalizing EU country pairs to trade of non-liberalizing country pairs in the EU and liberalizing country pairs in the control group. Instead of measuring heterogeneity of member countries regulation as done in previous studies on the service directive, we step back from the requirement of (minimum) harmonization of

regulation across EU countries and argue that regulatory competition (initially aimed to be induced by the CoOP) lead to a reduction of (unnecessary) service trade barriers in both the reporter and partner country. This in turn will lead to a convergence of the regulatory environment at a lower level.

Three main econometric problems arise when estimating dummies for regional trade agreements in the gravity equation. In an influential paper, Baldwin and Taglioni (2006) describe in detail what they call *bronze, silver and gold medal mistake* in applying panel data. As already becoming known as "the multilateral resistance term" in the trade literature, Anderson and van Wincoop (2003) put forward the argument that bilateral trade between any two countries does not solely depend on the bilateral trade barrier between those two but also on the remoteness, i.e. each country's resistance to trade with all other trading partners. Thus, for a given bilateral barrier between country *i* and *j*, higher barriers between country *i* and its other trading partners will reduce the relative price of goods from country *j* and consequentially will raise imports from country *j,* and thus, the trade level. As a consequence, neglecting the "multilateral resistance term" in the regression and estimating trade flows depending on bilateral distance and the country's GDPs creates omitted variable bias because bilateral trade costs with all other countries will be included in the regression residual. One way to overcome the *gold medal mistake* is to account for the multilateral resistance term by including relative prices. Several studies which estimate gravity equations do so by estimating real GDP values and deflated nominal trade flows using the GDP price deflator. However, an inappropriate deflation of nominal trade values can create spurious correlation due to global inflation trends (*bronze medal mistake*) in addition to the bias which arise due to fact that the GDP deflator includes non-traded goods prices as well. In this respect, including time dummies can correct for mistaken deflation procedure. Nevertheless, an upward bias of the RTA effect arises from the GDP deflator which depends on the ratio between non-traded prices to traded prices. Countries in which non-traded goods prices are relatively high will be more open and consequentially countries that are more open (trade more) are more likely to engage in a RTA. We try to avoid the bronze and *silver medal mistake* (which arises when using the average of the two-way exports) and estimate the gravity equation with nominal trade and GDP values as well as uni-directional trade flows. According to Baldwin and Taglioni (2006), country fixed effects will cover what they call – "the gravitational un-constant term" by removing the cross-section correlation between the multilateral resistance term and the independent variables. On top, when applying panel data analysis it needs to be considered that "the gravitational un-constant term" correlates with the trade cost not only in the cross-section but also over time which will bias the coefficient of the RTA dummy. Thus, including country dummies in panel data is not enough to account for the time-series correlation. Including time-varying country dummies instead will completely absorb the bias stemming from the *gold medal error* and correct for the time-series correlation. But time-varying country dummies alone

would not remove the bias stemming from the correlation between the EU dummy and unobservable pro-trade factors. Time-invariant pair dummies are superior to nation dummies and correct for this bias. However, adding pair fixed effects will drop all other time-invariant variables such as distance, common border and common official language. Thus, we estimate the gravity model with time-invariant bilateral pair dummies and year fixed effects and report robustness checks with bilateral pair dummies and time varying country dummies.

Data

To estimate the effect of the service directive on bilateral trade we use yearly data on commercial and specialized business services trade for the period 2004 to 2010 from the Eurostat database (Eurostat 2011a).[17] In general, (commercial and business) service trade is based on balance of payments statistics and include mode 1 (cross-border) and mode 2 (consumption abroad) services provision.[18] The Eurostat database contains bilateral trade data at a disaggregated level for a range of services sectors for the years 2004-2010. Article 2 of the final service directive includes a long list of exceptions. The right way to look at the expected impact of the service directive is to list explicitly services which fall under the directive (see consideration 33 in the directive). Thus, commercial services (COMEX) subject to the directive is the aggregated value of trade in construction services, computer and information services, and other business services. Moreover, other business services (BUSEX) are highly specialized producer services and include: leasing, legal, accounting, management and public relations services, advertising, architectural, engineering and other technical consultancy services and research and development (see Appendix A1.1). We construct a sample which includes bilateral trade flows of 25 member countries of the European Union (EU25), 2 members (Bulgaria and Romania) entering in the year 2007 and 6 non-member countries (Croatia, Iceland, Japan, Norway, Turkey and the US) with its respective 65 trading partners (see Appendix A1.2 and A1.3).

Restrictions on trade in services in general can be classified into frequency indicators, quantity-based measures and price-based measures. The frequency indicators are constructed indicators based on qualitative information which are translated via a system of scores and weights into quantitative measures (Hoekman 1995, Nguyen-Hong 2000, Langhammer 2005).[19] The OECD has developed and recently deepened and updated indicators of product market regulation (PMR) which is a subset of several indicators (see Wölfl et al. 2009). The PMR indicator data is based on responses to the regulatory

[17] Monthly trade data would be more appropriate to account for impact of the financial crisis but are not available.
[18] The WTO estimated that world service trade covered by GATS is dominated by mode 3 (commercial presence) with 50 per cent, followed by mode 1 (cross-border trade) with 30 per cent, mode 2 (consumption abroad) with 15 per cent and mode 4 (presence of natural persons) with 1 to 2 per cent (Maurer et al. 2006).
[19] Quantity-based measures are derived from estimating trade models (in the absence of barriers) and use the residuals to compare the differences between actual and potential trade level (e.g. Hoekman and Francois 1999, Fink, Mattoo and Neagu 2002) or use various dummy variables (Deardorff and Stern 1998). Price-based measures are derived from differences in domestic prices of an imported good and the reference foreign prices.

indicators questionnaire provided by national governments and represents an internationally comparable dataset which is consistent across time and countries. Generally speaking, the PMR indicators measure the extent to which policy settings promotes competition in areas of product market (or in the area of professional services) in a given year (OECD 2011). For the empirical analysis we select the following indicators: *regulatory and administrative opacity (RAO)*, *administrative burdens on start-ups (ABS), barriers to competition (BC) explicit barriers to trade and investment (BTI)* and *state control (SC)*. These indicators were used to quantify *ex ante* the effects of the directive on removing regulatory heterogeneity. In addition, the OECD also publishes regulatory indicators for specialized business services (accounting, architectural, engineering and legal service). The regulatory indicators for professions (PROF) are based on questionnaires among professional service providers on entry- and conduct-regulation in a given profession in a respective country. The OECD provides an overall country-level indicator for professional service (PROF) which is the simple average of the indicators for each profession. We calculate an indicator for entry regulation (PROF-E) and conduct regulation (PROF-C) accordingly. The 2008 update and revision of the PMR indicators is available for 30 countries in the years 1998, 2003 and 2008 while the regulation database for professional services offers status quo level of regulation for the years 1996, 2003, and 2008. Both datasets can be used for cross-section estimates for the respective years. However, the level of regulation for three points in time is less useful when applying panel-data analysis. Instead, we use the PMR indicators to build a range of liberalization dummies. In general, the dummy (LIB_t_*) is equal to 1 for each trading pair where both the reporter country and the trading partner reduce regulation within the period 2003 to 2008, i.e. the respective regulatory indicator is lower in 2008 compared to 2003. Having this in mind, limitations arise with respect to the directive-induced deregulations. The data does not allow differentiating whether deregulation occurs prior to the directive (2004 to 2006) or afterwards (2007 to 2008). Since the proposal of the directive is discussed from 2004 on, it can be argued that service providers could postpone business trade and wait for the signature of the agreement to benefit from lower trade barriers in the future (implying higher trade levels in the post-2007 period). However, Baier and Bergstrand (2007) and Guillin (2011) provide evidence that future trade agreements have no impact on current trade levels. In addition, a phase-in period in the directive allows EU members to adopt relevant laws and regulations until 2009. Guillin (2011) finds that a phase-in period of about a year is required to obtain the full economic effects of an agreement in services. Baier and Bergstrand (2007) estimates indicate that even after ten years the formation of a RTA increase merchandise trade. However, we account for the phase-in period by excluding the years of implementation (2007 to 2009) and report results in the robustness section.

Standard gravity variables include the GDP (in current USD) for the reporter country and the trading partner which is taken from WDI database (World Bank 2011) and converted

into euro figures using average annual exchange rates (Eurostat 2011b) as the service trade figures from Eurostat are reported in euro. We account for trading cost related to distance (population weighted distance *distw* provided by CEPII 2011*)* between trading partners and whether two countries share a common border as well as a common official language (CEPII 2011). However, these bilateral control variables do not show up in the estimates as they are absorbed in the pair fixed effects.

Descriptive Statistics

The dataset includes 15015 observations and represent 2145 trading pairs (33*65 countries) observed for a time period of 7 years (2004 to 2010) (see appendix A2). Due to missing data on commercial- and business service trade, the number of observations drops to around 9187 observations for commercial services (1313 trading pairs on average per year) and 8357 observations for business services (1193 trade relations). Although the number of trading partners in the panel seems to be very low especially in the specialized business services, appendix A1.2 shows that summing up each reporter country's bilateral trade represent an (annual) average of more than 85 per cent of total business service trade. Business service trade relations are highly concentrated on a few business partners in a few markets.

The mean value of intra-EU25 (0.291) indicates 625 intra-EU25 trading pairs. In order to allow for different integration path into the European market for services we consider subgroups of the EU and distinguish into the entire member countries (*intraEU15*) (15*15 =225 trading pairs) and the new member states (*intraEU10*) joining in 2004 (100 trading pairs).[20] To capturing all trade relations within the EU25, a subgroup (*interEU*) where the reporter is member of EU15 (EU10) while the trading partner is member of EU10 (EU15) (2*15*10 = 300 trading pairs) is included. Moreover, the dataset allows analysing service trade agreements between non-EU-members (*RTAother* represents 150 trade relationships). We are further interested in the net effect of the EU directive and control for trade diverting effects of deepening the internal market for services. While Gosh and Yamarik (2004a,b) propose to use a dummy which is equal to one if either the reporter *i* or the partner *j* is member of a specific RTA-bloc while the other is not, we follow the method by Soloaga and Winters (2001) and use a separate dummy for bloc-exports and bloc-imports. Baldwin (2010) argues that liberalization of non-tariff barriers (e.g. standardization of regulations) may lead to external trade creation (instead of trade diversion) such that non-bloc members export more to the members of a RTA. Thus, for partner countries with no service trade agreement, we include a dummy *NoRTAEUi* where the EU is a reporter (exporter) country (925 country pairs) and a dummy *NoRTAEUj* in which the EU is an importer country (178 country pairs). In addition, we consider whether the EU has signed a service trade agreement with its partner countries or not. The dummy *RTAEUi* is equal to one for EU

[20] The speed of convergence in the regulatory level and the supply of most advanced services are shown to differ for both group (see Daniels et al. 2011, Stare and Jaklic 2008, Piatkowski and van Ark 2005).

members signing service-RTAs with non-members (these include Mexico, Chile, Croatia, Bulgaria, Romania and Albania).[21] In sum, the dataset represents 2145 trading pairs of which roughly two thirds (1450 trading pairs) are subject to a services trade agreement. For the difference-in-difference-in-difference estimator, the number of observation drops considerably due to data limitation on regulation indicators. Important to note, the dummy on intra-EU10 includes only trade relationships among the Visegrad-4 countries (Czech Republic, Poland, Hungary, and Slovak Republic). For the year 2003 data are not reported by Estonia, Latvia and Lithuania, Malta and Cypres, and Slovenia. The panel includes 5440 observations for each of the regulatory indicator and is reduced to roughly one third of the (entire) full sample (i.e. 720 trading pairs per year compared to the above mentioned 2145).[22]

Comparing the mean values of the PMR liberalization indicators in the sample, the weakest performance in deregulation by far can be observed for the *professional services (LIB$_{t}$_PROF)*: Accordingly, 35.5 per cent of 720 trading pairs in the sample liberalize overall restrictions for professional services. More progress has been made in liberalizing *barriers to competition (LIB$_{t}$_BC)* with 82.5 per cent, and *state control (LIB$_{t}$_SC)* measures with 72.9 per cent. Liberalization of *regulatory and administrative opacity (LIB$_{t}$_RAO), barriers to trade and investment (LIB$_{t}$_BTI), and administrative burdens on start-ups (LIB$_{t}$_ABS)* show a relatively high performance. Although the liberalization of professional services is weak compared to other PMR indicators mentioned, when disentangling the indicator for professional services (*LIB$_{t}$_PROF*) into entry-regulations (*LIB$_{t}$_PROF-E*) and conduct-regulations (*LIB$_{t}$_PROF-C*) we find even lower liberalization efforts for *entry* conditions than for conduct conditions.

Recent international trade literature put forward the problem of endogeneity when estimating dummies for trade agreements. Magee (2003) argues that signing a regional trade agreement is associated with political and economic factors und presents evidence for differences in almost all explanatory variables for country pairs which belong to a RTA. In this respect, the correlation matrix of our dataset in appendix A3 suggests a high cross-correlation between the distance variable and the EU25-dummy with a coefficient of around 0.58. However, the cross-correlations between distance and EU-dummy is even lower (coefficients are below 0.35) for subgroups of EU. Correlations do not seem to be a big problem for other independent variables which is especially surprising with respect to liberalization dummies: the correlation coefficients between liberalization of PMR regulation and the EU-dummy are still below 0.26 throughout.

[21] We add EU trade relations with Bulgaria and Romania to this dummy as well despite the EU enlargement in 2007, because the national implementation of the service directive in EU-2 may blur the effect for the EU25 countries being member at the time before the directive.

[22] Although the number of trade relations for each reporter country cut in half from 65 trading partners per year to 30 trading partners per year, the aggregated value of bilateral trade for each reporter country remains relatively high with more than 90 per cent of the previous level. Business service trade tend to be highly concentrated on those markets for which regulation data are reported.

Table 2: Group mean comparison for independent variables

Variable	EU25	Control	Diff	t-value	RTAother	Control	Diff	t-value
LnDist	7.021	8.421	1.400***	85.758	8.606	8.001	-.605***	-6.241
Border	.099	.026	-.073***	-19.214	.106	.047	-.059***	-3.151
Language	.045	.045	.000	.069	.152	.044	-.108***	-5.939
Ln(GDPi*GDPj)	23.906	24.136	.229***	5.173	25.267	24.055	-1.212***	-5.869
(LnGDPi-lnGDPj)	1.869	1.985	.115***	4.386	2.799	1.942	-.857***	-6.996
LIB_{tt}_RAO	.543	.619	.077***	5.64	.909	.570	-.339***	-5.996
LIB_{t}_BTI	.543	.571	.0278**	2.024	.831	.546	-.286***	-5.009
LIB_{t}_ABS	.468	.584	.115***	8.424	.636	.517	-.119**	-2.070
LIB_{t}_BC	.897	.763	-.134***	-13.06	.494	.830	.337***	7.759
LIB_{t}_SC	.709	.756	.047***	3.823	.922	.726	-.196***	-3.844
LIB_{t}_PROF	.468	.224	-.244***	-19.316	0	.361	.361***	6.595
LIB_{t}_PROF-E	.136	.157	.021**	2.158	0	.155	.155***	3.760
LIB_{t}_PROF-C	.399	.324	-.075***	-5.672	.325	.350	.026	.469
RAO_2003	2.118	2.601	.483***	8.408	1.895	2.601	.706***	2.855
BTI_2003	.633	.725	.092***	5.871	1.361	.725	-.635***	-11.230
ABS_2003	3.927	2.598	-1.328***	-18.695	2.145	2.598	.453***	1.957
BC_2003	3.142	3.840	.698***	23.498	5.676	3.840	-1.836***	-14.190
SC_2003	6.454	5.422	-1.032***	-13.651	3.488	5.422	1.934***	5.906
PROF_2003	4.970	4.692	-.278***	-3.633	3.067	4.692	1.625***	5.770
PROF-E_2003	8.661	8.409	-.252**	-2.047	7.567	8.409	.841**	1.992
PROF-C_2003	2.297	2.043	-.254***	-4.055	.519	2.043	1.524***	5.981

Note: The t-test on the EU25 (RTA) membership includes RTAs (EU25) country pairs in the control group. Excluding RTA membership from the control group do not change the results significantly except for the EU25 mean on *Liberal_BTI* which becomes insignificantly different from the control group. The means for the regulatory level variables in 2003 are compared to country pairs not having signed any service-RTA.
Source: own calculations based on Eurostat (2011a).

Table 3: Group mean comparisons for dependent variables

	All	EU25	EU15	EU10	InterEU	RTAEUi	NoRTAEUi	NoRTAEUj	RTAother
LnCOMEX	2.592	3.273	5.111	1.413	2.595	1.907	2.247	2.974	3.935
	(2.520)	(2.313)	(1.838)	(1.862)	(1.859)	(2.130)	(2.498)	(2.250)	(3.270)
	[9187]	[3318]	[1134]	[512]	[1672]	[420]	[3842]	[683]	[69]
LnBUSEX	2.286	2.930	4.714	1.191	2.276	1.740	1.989	2.601	3.035
	(2.491)	(2.322)	(1.934)	(1.810)	(1.914)	(2.095)	(2.464)	(2.238)	(3.639)
	[8357]	[3051]	[1031]	[476]	[1544]	[393]	[3468]	[652]	[47]
				Treatment of the service directive: Time*Group					
LnCOMEX	2.499	3.164	4.862	1.477	2.507	1.925	2.175	2.999	3.802
	(2.508)	(2.275)	(1.905)	(1.859)	(1.871)	(2.093)	(2.474)	(2.263)	(3.440)
	[5370]	[1902]	[655]	[285]	[962]	[264]	[2159]	[427]	[50]
LnBUSEX	2.098	2.686	4.279	1.237	2.063	1.699	1.842	2.589	2.762
	(2.480)	(2.303)	(2.089)	(1.777)	(1.971)	(2.099)	(2.436)	(2.238)	(3.846)
	[4629]	[1648]	[556]	[249]	[843]	[240]	[1821]	[405]	[33]

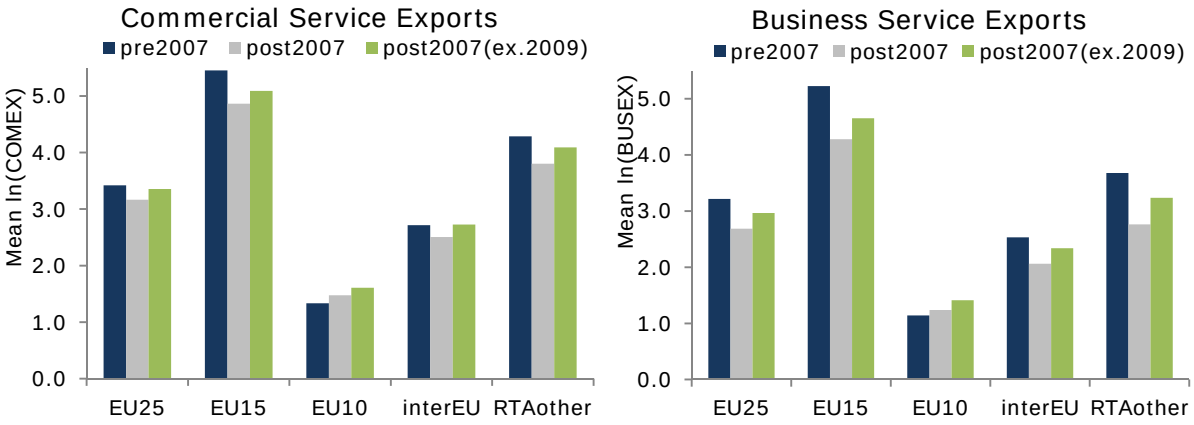
Note: standard deviation in parenthesis, number of observation in squared brackets.
Source: own calculations based on Eurostat (2011a).

Nevertheless, table 2 presents the t-test for differences in the means of explanatory variables for EU-country pairs and country pairs of service-RTAs. At the first glance, we find significant differences in the means for nearly all independent variables and for both types of membership.For EU members, it is obvious that they are closer geographically and share more often a common border. Negotiating an RTA is more likely between countries of similar economic size: the log difference in GDP is smaller for EU country pairs than for the respective control group. The t-tests reveal contradictory results for members of a service-RTA: the mean differences on almost all variables are significantly negative. In more detail, country pairs having signed a service-RTA are rather distant geographically and differ even more in their economic size than non-RTA country pairs. Dropping country pairs with a service agreement (EU or RTAother) from the respective control group does not change the results. Significant differences in the means are also visible for all liberalization indicators. Except for *barriers to competition (LIB$_t$_BC)* and *professional services* (where data is missing for respective members of an RTAother), country pairs that liberalize PMR are more likely having signed a RTA. However, the mean value of the liberalization dummies are rather smaller for EU25 country pairs - except for *LIB$_t$_BC* and *LIB$_t$_PROF* – and seem to indicate less effort in freeing up markets compared to country pairs not being member of any service-RTA. In this respect, it needs to be acknowledged that starting accession negotiation to joining the EU is already associated with satisfying several conditions on e.g. competitive market structures. The entire regulatory level in the year 2003 serves as an explanation: as expected, the initial regulatory levels (*_2003) are significantly smaller for country pairs subject to the EU and a service-RTA.

According to table 3, the mean value of log commercial service exports (COMEX) is remarkably lower for an average intra-EU25 country pair (26.4 billion Euro = exp(3.273)) than the average value traded between countries within service-RTAs (51.2 billion Euro). In the entire EU15 COMEX is six times higher (165.8 billion Euro) than the average intra-EU25. Intra-EU10 export value (4.1 billion Euros) is the lowest. Commercial service trade between EU10 and the entire group of members (*interEU*) is on average higher (13.4 billion Euros). The difference between intra-EU25 and intra-service-RTA is nearly negligible when turning to specialized business services: intra-EU25 BUSEX (18.7 billion Euros) nearly equals the average intra-service-RTA export (20.8 billion Euros). The standard deviation is even lower for intra-EU trade than an average service-RTA country pair. According to the latter part of the table, the average export values in the treatment period 2007-2010 are still below the respective values of the complete sample and suggest the impact of the financial crisis. The differences of pre-and post-2007 average values in figure 1 show that prior to 2007 exports are still higher than in the post-2007 period for intra-EU25, but also for intra-EU15 and inter-EU trade. More importantly, service trade between an average country pair in a service-RTA is lower in the post-2007 period as well. Dropping the crisis year 2009 from the sample suggest that the financial crisis has affected trade between all groups in a same

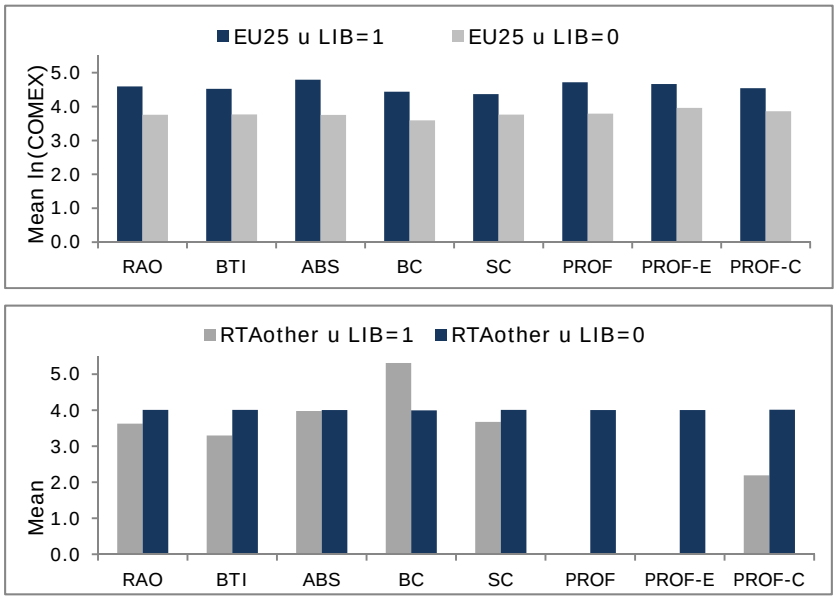
direction. Excluding 2010 as well, post-2007 levels for COMEX and BUSEX are even higher than in the pre-2007 period for all groups. Consequentially, evaluation of the service directive requests to account for the impact of the crisis. Including year fixed effects absorbs the effect of the financial crisis in the year dummy, but assumes that the crisis has affected all countries in the same way. Estimating the model with time-varying country fixed effects allows controlling for the financial crisis under the assumption that the crisis has affected countries differently. We further estimate a sample for the period 2004 to 2008 as a robustness test.

Figure 1: Pre-and post-2007 average commercial- and business service trade



Source: own compilation based on Eurostat (2011a).

Figure 2: Liberalization of regulatory barriers and commercial service exports



Note: sub-indicators represent liberalization of regulatory and administrative opacity (RAO), explicit barriers to trade and investment (BTI), administrative burdens on start-ups (ABS), barriers to competition (BC), state control (SC).
Source: own calculations based on Eurostat (2011a) and Conway and Nicoletti (2006).

The DDD-estimator accounts for liberalization efforts of EU member countries induced by the service directive. In general, a positive correlation between liberalization of PMR and intra-EU commercial service trade can be testified (figure 2). COMEX is always (i.e. for each single market barrier) higher for an average EU25 country pair liberalizing regulation. The EU export pattern of business services is still similar to commercial services and excluded for brevity.[23]

4 Empirical Evidence

In the empirical models, three explanatory variables are of interest to evaluate the effect of the service directive on service export: Firstly, the time dummy compares pre- and post-level of service trade for an average country pair in the control group. A positive coefficient reflects the increasing tradability of services in the post period. However, the crisis could be a good explanation for a negative coefficient on the time dummy, and hence, a lower growth of service trade in the post-2007 period. Secondly, the DD-estimator (*T*intraEU*) measures the trade effect of the directive on the treated group of EU member states. More in detail, a positive coefficient on the DD-estimator indicate higher growth of service trade in the EU in the post period compared to the trade growth in the control group. From this perspective, remind that member countries of the EU need to comply with the service directive enacted by the European Union's bodies by bringing laws and regulations at a national level into force (until the end of 2009). Nevertheless, national governments may postpone adopting relevant deregulations or even raise the level of restriction as powerful interest groups defending their position may successfully lobby against the lowering of market entry barriers. Having said this, a negative coefficient on the DD-estimator indicates that growth of intra-EU service trade is below the growth of service trade of the control group. Statistically, the negative effect could stem from EU country pairs that increase non-tariff barriers which outbalance the expected positive effects of country pairs implementing the directive. Thus, distinction between liberalizing and non-liberalizing country pairs is an attempt to relate the treatment effect of the directive to the regulatory content. The coefficient of the DDD-estimator ($T^*intraEU^*LIB_t$) measures the difference in the trade level of EU country pairs (treated to the service directive) which liberalize service market regulation compared to the control group. A positive coefficient on the DDD-estimator indicate that EU country pairs which act in accordance with the directive by liberalizing national regulation for foreign services providers will gain by an increase in service trade. On the contrary, a negative coefficient can be interpreted as (short term) adjustment to the

[23] Contrarily, the export value for a service-RTA country pair opening up service markets is below the mean of any non-liberalizing service-RTA country pair. Turning to the initial level of restriction (the level indicators of PMR in the year 2003), the negative relationship between a higher level of restriction and lower trade flow is consistent with the expectation. For this purpose, EU25 and RTA country pairs are clustered into two groups (below average and above average) based on the mean level of restrictions (of each regulatory indicator) in the complete sample. We compare the mean of commercial service trade for below- and above PMR average groups.

competitive pressure of opening markets which leads to a selection process with efficient service providers surviving.

Evidence from DD-estimates

DD-estimates for commercial- and business service trade are reported in Table 4. The time effect is positive significant and indicate that commercial service export is 73.3 per cent (=exp(.550)-1) higher in the post-2007 period compared to the pre-period for a country pair in the control group. The coefficients on the time variable are comparable when substituting intra-EU25 by single subgroups of the EU in column 2 and 3. More interestingly, the DD-estimator (*T*intraEU*) for intra-EU trade in the post period is negative and indicate that intra-EU25 commercial service export in the post period is significantly lower than the trade level of a country pair in the control group (by 39.6 per cent according to column 1). A breakdown into EU subgroups reveals that intra-EU15 commercial service trade is significantly lower in the post period (by 51.3 per cent according to column 2). The coefficients are slightly lower for intra-EU10 and inter-EU trade relations. In the third column, we distinguish commercial service trade flows from east (EU10) to west (EU15) and in the opposite direction and find that both trade flows are negatively affected by the service directive. Moreover, we find trade diverting effects of the service directive for EU member's exports to third countries (*NoRTAEUi*) not being part of any agreement while the European Union's import from members outside the bloc (*NoRTAEUj*) is not significantly different from zero. However, a positive coefficient can be obtained for service-RTAs, but commercial service trade of non-EU members is not significantly affected by the service directive. In the fourth column we add time-varying country fixed effects to the time-invariant pair dummies and find a negative time effect. The DD-estimator remains robust for all intra-EU trade relationships.

We find similar results for business services exports: The DD-estimator is negative for intra-EU25 trade. Business service trade is lower in the period after the adoption of the service directive for all intra-EU subgroups. In contrast to commercial service trade, the coefficient of the time dummy is negative as well and turns insignificant when estimating time-varying country dummies in column 4. Thus, growth of business service trade is significantly lower in the post-2007 period for a country pair in the control group as well. The treatment effect is significantly negative for trade relations of EU members with non-members signing a service trade agreement (*RTAEUi*). In addition, while EU members' business service export to third countries is negatively affected by the directive, EU imports from third countries tend to be higher in the post period, although insignificant. As expected, the service directive has no robust effect on business service trade of other service-RTAs. However, including time-varying country dummies turns most of the coefficients insignificant.

Table 4: Commercial and Business Service Exports: DD-estimates

	Commercial Service Exports (COMEX)				Business Service Exports (BUSEX)			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Time	0.550***	0.602***	0.602***	-1.035**	-1.013***	-0.907***	-0.906***	-0.669
	(0.101)	(0.101)	(0.102)	(0.437)	(0.117)	(0.120)	(0.120)	(0.567)
				Difference-in-differences				
T*intraEU25	-0.504***				-0.790***			
	(0.0874)				(0.0882)			
T*intraEU15		-0.720***	-0.720***	-1.543**		-1.062***	-1.063***	1.215
		(0.107)	(0.107)	(0.561)		(0.0916)	(0.0915)	(1.045)
T*intraEU10		-0.343**	-0.343**	-1.175**		-0.466**	-0.468**	1.853*
		(0.153)	(0.153)	(0.581)		(0.151)	(0.151)	(1.060)
T*interEU		-0.427***				-0.750***		
		(0.0972)				(0.0993)		
T*EUij=1510			-0.435***	-1.263**			-0.889***	1.554
			(0.121)	(0.557)			(0.114)	(1.035)
T*EUij=1015			-0.422***	-1.339**			-0.664***	1.432
			(0.114)	(0.568)			(0.117)	(1.048)
T*RTAother	0.0792	0.0538	0.0536	0.132	0.0859	0.0502	0.0474	0.220
	(0.131)	(0.131)	(0.131)	(0.214)	(0.241)	(0.242)	(0.238)	(0.281)
T*RTAEUi	-0.0983	-0.110	-0.110	-0.483	-0.363**	-0.383**	-0.384**	0.972**
	(0.140)	(0.140)	(0.140)	(0.365)	(0.139)	(0.139)	(0.139)	(0.431)
T*NoRTAEUi	-0.452***	-0.460***	-0.460***	-0.833**	-0.742***	-0.754***	-0.759***	0.472
	(0.0897)	(0.0895)	(0.0896)	(0.369)	(0.0886)	(0.0882)	(0.0881)	(0.836)
T*NoRTAEUj	0.149	0.146	0.146	-0.303	0.156	0.149	0.153	1.211**
	(0.0974)	(0.0970)	(0.0971)	(0.378)	(0.104)	(0.104)	(0.104)	(0.391)
constant	-17.87***	-15.79***	-15.79***	-70.83***	-15.20***	-12.18***	-12.13***	28.32**
	(2.624)	(2.741)	(2.744)	(4.432)	(2.493)	(2.590)	(2.573)	(9.592)
pair wise FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y		Y	Y	Y	
Tv country FE				Y				Y
N	8793	8793	8793	8793	8018	8018	8018	8018
Groups	1619	1619	1619	1619	1558	1558	1558	1558
Within R^2	.1749	.1769	.1769	.5412	.4084	.4114	.4119	.6577
Between R^2	.4125	.4048	.4050	.2955	.3882	.3685	.3747	.2650
adj. R^2	.3829	.3763	.3766	.2694	.4162	.4013	.4093	.1619

Standard errors robust to heteroscedacity reported in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Note: The dependent variable is the log of exports of commercial services (business services respectively) in the period 2004-2010. See appendix A1.1 for services sector included and appendix A2 for country pairs included in the trade agreements.

Although we find the relevant treatment effect for EU members (and no robust effects for non-members in the sample), it is debatable whether the treatment effect really measures the impact of the service directive. The negative parameter estimates may indicate short-term adjustment cost of liberalizing the internal market or may reflect the impact of the crisis to some extent. The treatment effect needs to be linked to deregulations to draw conclusion with respect to the effect of the directive's regulatory content. Trade effects should show up in the DDD-estimates for EU member countries if deregulation is a consequence of the directive adopted in the member states. Reminding that PMR data is available for 30 countries, the number of observation drops significantly.[24] According to the robustness checks in table 5, excluding country pairs from the sample do not change the treatment effect of the directive on intra-EU trade. Now, the time dummy highlights that the control group trades significantly more business services in the post period.

[24] Regulatory data are rarely provided by the new EU members such that intra-EU10 now covers trade among the Visegrad-4 countries. Appendix A1.2 shows that excluding roughly 60 per cent of our observations corresponds to a loss of bilateral trade value of 10 per cent on average, and thus, do not remove the information content of the data at all.

Table 5: Robustness of the DD-estimates: restricted sample

	COMEX				BUSEX			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Time	0.823***	0.808***	0.820***	0.766**	1.065***	1.077***	1.077***	0.183
	(0.102)	(0.104)	(0.105)	(0.256)	(0.146)	(0.146)	(0.146)	(0.235)
				Difference-in-differences				
T*intraEU25	-0.936***				-1.142***			
	(0.0967)				(0.140)			
T*intraEU15		-0.932***	-0.934***	0.390		-1.191***	-1.191***	-0.225
		(0.105)	(0.105)	(0.255)		(0.139)	(0.139)	(0.304)
T*intraEU10		-1.473***	-1.464***	-		-1.393***	-1.393***	-
		(0.223)	(0.223)			(0.235)	(0.235)	
T*interEU		-0.902***				-1.025***		
		(0.125)				(0.163)		
T*EUij=1510			-0.742***	0.820**			-1.025***	0.611**
			(0.156)	(0.254)			(0.176)	(0.250)
T*EUij=1015			-1.009***	0.218			-1.025***	-0.313
			(0.153)	(0.219)			(0.188)	(0.282)
T*RTAother	-0.301***	-0.300***	-0.307**	-0.289	-0.401**	-0.398**	-0.398**	-0.270
	(0.0910)	(0.0903)	(0.0929)	(0.255)	(0.177)	(0.178)	(0.178)	(0.418)
T*RTAEUi	-0.766**	-0.766**	-0.774**	0.0658	-1.111***	-1.109***	-1.109***	-1.493**
	(0.245)	(0.245)	(0.245)	(0.348)	(0.277)	(0.277)	(0.277)	(0.502)
T*NoRTAEUi	-0.827***	-0.831***	-0.835***	-0.145	-0.989***	-0.985***	-0.985***	-1.885***
	(0.113)	(0.113)	(0.114)	(0.157)	(0.144)	(0.144)	(0.144)	(0.244)
T*NoRTAEUj	-0.129	-0.134	-0.133	0.451**	-0.122	-0.119	-0.119	1.722***
	(0.120)	(0.121)	(0.122)	(0.174)	(0.172)	(0.171)	(0.171)	(0.185)
constant	-24.77***	-26.19***	-25.49***	26.22***	-24.23***	-23.42***	-23.42***	14.22*
	(5.263)	(5.578)	(5.622)	(4.884)	(4.375)	(4.609)	(4.578)	(7.273)
pair wise FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y		Y	Y	Y	
Tv country FE				Y				Y
N	3471	3471	3471	3471	3167	3167	3167	3167
Groups	588	588	588	588	571	571	571	571
Within R^2	.3217	.3233	.3240	.7260	.6199	.6209	.6209	.8302
Between R^2	.3292	.3337	.3223	.1969	.3783	.3750	.3749	.0306
overall R^2	.3169	.3200	.3096	.0660	.4340	.4330	.4330	.0043

Standard errors robust to heteroscedacity reported in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Note: The dependent variable is the log of exports of commercial services (business services respectively) in the period 2004-2010. The restricted sample includes country pairs for which regulation data is available (see appendix A2 for a list of countries).

Evidence from DDD-estimates

The DDD-estimates are presented in table 6 for commercial services and table 7 for business services respectively.[25] The heading of each column indicate which deregulation dummy is added in the respective model. In some models the DDD-estimator is dropped due to collinearity with the DD-estimator.[26] The time effect signals a higher value of commercial service traded in the post-2007 period for country pairs in the control group. The DD-estimator remains negative for intra-EU trade as shown before. We find mixed evidence for the effect of service market liberalization on commercial service trade for the early adopters of the service directive. Liberalization of *regulatory and administrative opacity (LIB_t_RAO)* and *administrative burdens on start-ups (LIB_t_ABS)* have *ex post* not as much contributed to increase intra-EU commercial service trade as indicated by *ex ante* evaluations by Kox, Lejour and Montizaan (2005) and Weber and Asmus (2008).

[25] The estimates for intra-EU25 reported in appendix A4 suggests significant negative effects of deregulating *barriers to competition* and *state control* on commercial service trade. Business service trade in the internal market is not significantly affected. However, subsuming all country pairs into EU25 does not allow focusing on reallocation within the internal market.
[26] This is explained by the fact that either all country pairs in the respective group (e.g. intra-EU10) deregulate or no country pair liberalize. The missing control group prevent a comparison on differences in deregulation.

Table 6: Liberalization of regulatory barriers and commercial service trade: DDD-estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	(RAO)	(BTI)	(ABS)	(BC)	(SC)	(PROF)	(PROF-E)	(PROF-C)
Time	0.849***	0.810***	0.853***	1.146***	0.643***	0.803***	0.814***	0.741***
	(0.120)	(0.122)	(0.135)	(0.282)	(0.117)	(0.115)	(0.119)	(0.0941)
				Difference-in-differences				
T*intraEU15	-0.797***	-1.108***	-0.866***	0.181	-0.316*	-0.767***	-0.917***	-0.727***
	(0.173)	(0.138)	(0.162)	(0.338)	(0.163)	(0.145)	(0.118)	(0.123)
T*intraEU10	-1.256***	-	-1.266***	-1.341***	-	-1.309***	-1.364***	-1.255***
	(0.238)		(0.248)	(0.215)		(0.246)	(0.246)	(0.238)
T*interEU	-0.895***	-0.982***	-0.936***	-0.634	-0.617**	-1.100***	-0.970***	-1.021***
	(0.176)	(0.189)	(0.188)	(0.438)	(0.208)	(0.146)	(0.139)	(0.131)
T*RTAother	-0.404***	-0.353***	-0.354**	-0.650**	-0.147*	-0.281**	-0.310**	-0.212**
	(0.115)	(0.106)	(0.140)	(0.282)	(0.0885)	(0.0984)	(0.103)	(0.0825)
T*RTAEUi	-0.613	-0.993**	-0.837**	0.878**	0.308	-0.747**	-0.777**	-0.331
	(0.554)	(0.319)	(0.265)	(0.275)	(0.709)	(0.247)	(0.250)	(0.456)
T*NoRTAEUi	-0.772***	-1.004***	-0.693***	-0.421	-0.114	-0.751***	-0.815***	-0.638***
	(0.185)	(0.163)	(0.204)	(0.343)	(0.203)	(0.129)	(0.128)	(0.124)
T*NoRTAEUj	-0.0720	-0.0218	-0.132	-1.270**	-0.214	-0.337**	-0.206	-0.203*
	(0.195)	(0.195)	(0.205)	(0.580)	(0.315)	(0.126)	(0.139)	(0.104)
				Difference-in-difference-in-differences				
T*intraEU15*LIB_t	-0.194	0.380*	-0.206	-1.283***	-0.948***	-0.483**	-0.299	-0.682**
	(0.203)	(0.196)	(0.195)	(0.346)	(0.203)	(0.178)	(0.245)	(0.240)
T*intraEU10*LIB_t	-0.413	-1.450***	-0.441	-	-1.551***	-0.858**	-0.634**	-1.059***
	(0.380)	(0.222)	(0.384)		(0.230)	(0.275)	(0.299)	(0.317)
T*interEU*LIB_t	0.0315	0.132	0.0502	-0.204	-0.395	0.465**	0.398	0.231
	(0.221)	(0.225)	(0.225)	(0.446)	(0.245)	(0.189)	(0.249)	(0.251)
T*RTAother*LIB_t	0.229	0.108	0.126	0.448	-0.235*	-	-	-0.437*
	(0.151)	(0.145)	(0.167)	(0.293)	(0.142)			(0.223)
T*RTAEUi*LIB_t	-0.133	0.348	-	-1.728***	-1.326*	-	-	-0.913
	(0.607)	(0.444)		(0.337)	(0.745)			(0.556)
T*NoRTAEUi*LIB_t	-0.0432	0.333	-0.200	-0.532	-1.013***	-0.489**	-0.142	-0.747**
	(0.223)	(0.214)	(0.234)	(0.357)	(0.237)	(0.230)	(0.279)	(0.265)
T*NoRTAEUj*LIB_t	-0.0814	-0.210	-0.00878	1.272**	0.0509	0.465**	0.415*	0.319
	(0.218)	(0.216)	(0.225)	(0.587)	(0.340)	(0.182)	(0.241)	(0.259)
N	3471	3471	3471	3471	3471	3471	3471	3471
groups	588	588	588	588	588	588	588	588
Within R^2	.3278	.3271	.3283	.3634	.3414	.3324	.3257	.3331
Between R^2	.3387	.3371	.3375	.3276	.3319	.3258	.3301	.3271
Overall R^2	.3239	.3225	.3227	.3324	.3239	.3128	.3183	.3148

Standard errors robust to heteroscedacity reported in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Notes: The dependent variable is the log of exports of commercial services in the period 2004-2010. See appendix A1 and A2 for services and countries included. The liberalization dummy equals unity for trading pairs which liberalize regulatory and administrative opacity (RAO), barriers to trade and investment (BTI), administrative burdens to start-ups (ABS), barriers of competition (BC), state control (SC)), overall barriers to professional services (PROF), entry and conduct regulation in the professions (PROF-E and PROF-C). The respective indicator is shown in the heading of each column. Estimates include pair-wise fixed effects and year dummies.

In contrast, deregulating *barriers to trade and investment (*LIB_t*_BTI)* lead to an increase of commercial service trade among the liberalizing members of the entire EU15. However, the treatment effect is significantly negative for trade among the new member states. Moreover, short term trade effects of liberalization of *barriers to competition (*LIB_t*_BC)* are negative for intra-EU15 commercial service trade as well (column 4). EU country pairs complying with the directive and deregulating *barriers to competition* experience a lower growth of commercial service trade in the short term than a country pair in the control group. The coefficient of the DDD-estimator indicates that trade growth is roughly 72.3 per cent lower than for a country pair neither being part of an RTA nor deregulate *barriers to competition*. The liberalization effect is significantly negative for EU trade with non-members as well although significantly higher.

Table 7: Liberalization of regulatory barriers and business service trade: DDD-estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	(RAO)	(BTI)	(ABS)	(BC)	(SC)	(PROF)	(PROF-E)	(PROF-C)
Time	1.139***	1.091***	1.119***	1.481***	0.830***	1.019***	1.040***	0.985***
	(0.180)	(0.171)	(0.202)	(0.357)	(0.180)	(0.155)	(0.167)	(0.136)
				Difference-in-differences				
T*intraEU15	-1.343***	-1.194***	-1.312***	-1.516***	-0.974***	-1.232***	-1.159***	-1.160***
	(0.190)	(0.173)	(0.208)	(0.386)	(0.179)	(0.154)	(0.157)	(0.132)
T*intraEU10	-1.206***	-1.312***	-1.172***	-1.298***	-1.537***	-1.219***	-1.238***	-1.155***
	(0.236)	(0.195)	(0.256)	(0.226)	(0.251)	(0.244)	(0.250)	(0.232)
T*interEU	-1.141***	-0.997***	-1.146***	-1.652***	-1.112***	-1.313***	-1.104***	-1.218***
	(0.221)	(0.242)	(0.238)	(0.387)	(0.234)	(0.173)	(0.181)	(0.157)
T*RTAother	-0.430*	-0.387*	-0.406*	-1.040**	-0.540**	-0.347*	-0.365*	-0.317
	(0.227)	(0.216)	(0.241)	(0.356)	(0.197)	(0.180)	(0.189)	(0.206)
T*RTAEUi	-1.306***	-1.266***	-1.148***	-0.755**	-0.706*	-1.056***	-1.076***	-1.035***
	(0.336)	(0.375)	(0.315)	(0.355)	(0.386)	(0.279)	(0.286)	(0.227)
T*NoRTAEUi	-1.143***	-1.039***	-1.122***	-1.053**	-0.636***	-0.912***	-0.958***	-0.840***
	(0.199)	(0.183)	(0.224)	(0.371)	(0.187)	(0.152)	(0.162)	(0.135)
T*NoRTAEUj	0.0843	0.119	0.0270	-0.719**	0.164	-0.337**	-0.150	-0.231
	(0.225)	(0.217)	(0.252)	(0.355)	(0.230)	(0.159)	(0.189)	(0.147)
				Difference-in-difference-in-differences				
T*intraEU15*LIB_t	0.391*	0.0709	0.317	0.413	-0.347	-0.302*	-0.169	-0.237
	(0.212)	(0.191)	(0.242)	(0.402)	(0.242)	(0.163)	(0.313)	(0.325)
T*intraEU10*LIB_t	-0.286	-	-0.418	-	-	-1.230**	-0.885*	-1.131**
	(0.396)		(0.414)			(0.394)	(0.467)	(0.486)
T*interEU*LIB_t	0.321	0.0337	0.270	0.742*	0.0239	0.486**	0.539	0.518
	(0.263)	(0.267)	(0.290)	(0.406)	(0.294)	(0.207)	(0.347)	(0.353)
T*RTAother*LIB_t	0.188	0.0591	0.0613	0.871**	-	-	-	-0.338
	(0.289)	(0.271)	(0.309)	(0.384)				(0.398)
T*RTAEUi*LIB_t	0.424	0.286	-	-0.301	-0.576	-	-	-0.369
	(0.471)	(0.486)		(0.445)	(0.501)			(0.512)
T*NoRTAEUi*LIB_t	0.392*	0.165	0.264	0.0719	-0.531**	-0.616**	-0.125	-0.544
	(0.225)	(0.203)	(0.258)	(0.392)	(0.252)	(0.212)	(0.348)	(0.342)
T*NoRTAEUj*LIB_t	-0.350	-0.457*	-0.330	0.715*	-0.436	0.447**	0.343	0.479
	(0.261)	(0.246)	(0.290)	(0.388)	(0.306)	(0.221)	(0.392)	(0.372)
N	3167	3167	3167	3167	3167	3167	3167	3167
groups	571	571	571	571	571	571	571	571
Within R^2	.6229	.6219	.6229	.6234	.6224	.6326	.6240	.6308
Between R^2	.3750	.3757	.3749	.3769	.3718	.3836	.3755	.3707
Overall R^2	.4305	.4314	.4325	.4353	.4312	.4379	.4358	.4299

Standard errors robust to heteroscedacity reported in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: The dependent variable is the log of exports of business services in the period 2004-2010. See appendix A1 and A2 for services and countries included. The liberalization dummy equals unity for trading pairs which liberalize regulatory and administrative opacity (RAO), barriers to trade and investment (BTI), administrative burdens to start-ups (ABS), barriers of competition (BC), state control (SC)), overall barriers to professional services (PROF), entry and conduct regulation in the professions (PROF-E and PROF-C). The respective indicator is shown in the heading of each column. Estimates include pair-wise fixed effects and year dummies.

Thus, trade-diverting effects reflect short-term adjustment cost following the removal of market barriers (*barriers to competition*) or the privatization of service sectors (remove *state control*). While most progress has been made in liberalizing barriers to competition in the internal market, the lowest effort in deregulation is visible in the professional services (table A2). From the perspective of national governments, the motivation to be restrictive rest on the fear of adverse trade effects from increasing competition and result in protecting domestic service providers. According to the DDD-estimates in column 6 to 8, intra-EU15 and intra-EU10 commercial services trade are significantly lower in the post period due to liberalization of professional services compared to the control group. However, the DDD-estimator for inter-EU trade relationships (EU15-EU10 and vice versa) confirm rather the opposite. Deregulations in the professions lead to a deeper integration of the new members into the European value-added-chain. However, deregulating professional service providers in turn lead to some extent to “external trade creation”: while the EU tend

to export less to third countries, members of the EU import significantly more from countries outside the bloc.

The evidence for reallocation of businesses within the EU is even more pronounced when turning to the DDD-estimates for specialized business services in table 7. The time variable validates a significant increase of business service exports in the post-2007 period for a country pair in the control group. Moreover, deregulation on the European Union's internal market promotes business trade between the entire EU15 and the new member states. The coefficients for entry- and conduct regulations are somewhat higher but trade is not significantly different than for a country pair in the control group. Moreover, the DDD-estimates indicate strong reorientation towards the new member states induced by deregulation of *barriers to competition (BC)*. However, the integration of the new members into the internal service market is associated with declining intra-EU10 business intensities: we find strong negative effects following the deregulation of professions. In contrast, new business trade is created within the entire EU15 market following the liberalization of *regulatory and administrative opacity (RAO)* which is reasonable from the fact that the remaining content of the service directive (which excludes the CoOP) should force members to simplify their administrative regulation and justify its compatibility with the directive. More interestingly, the (inter-EU) trade creating effect is not associated with trade diverting effects. To the contrary, EU members do import significantly more from those non-members which have not negotiated a service trade agreement with the EU. Conversely, the European Union's service trade agreement with external partners (especially accession candidate Croatia, and the members Bulgaria and Romania entering in 2007) has not significantly contributed to growing business service trade in recent years. In addition, the service directive leaves commercial and business service trade of non-EU-members which have negotiated a service-RTA almost unaffected. Except for removing *barriers to competition*, country pairs in a service-RTA deregulating services tend to grow not significantly more in the aftermath of the EU service directive as expected.

The service directive foster (or even aid) the process of deeper integration of the new member states into the European single market. Table 8 provides empirical evidence for increasing services exports from Eastern Europe into the entire EU15: the DDD-estimator (*T*EUij1015*LIB*) is significantly positive for east-west exports in the post-2007 period. Service exports in the opposite direction (i.e. from EU15 to Eastern Europe) are not significantly different. Rather negative trade effects are obvious from liberalizing *barriers to competition* and *state control*. Moreover, lowering *barriers to competition* lead to a reversal of trade flows and indicate a competitive advantage of EU10 countries in commercial services: exports of EU10 countries (i.e. the Visegrad-4) into the EU15 increases in the post-2007 period while EU15 exports towards Eastern Europe drops remarkably. The competitive disadvantage of EU15 vanishes when turning to specialized business services and implies that trade of construction and computer-and information service may drive the

result. Nevertheless, liberalizing barriers in the professions seem to demonstrate the increasing tradability, and notably, the outsourcing potential of specialized business services. The business service exports of Visegrad-4 towards the EU15 market increases following the deregulations. In the short run, liberalizing conduct regulation is slightly more trade creating than liberalizing entry conditions which confirms that deepening already established business relationships is comparably easier because investments in entering the market have already taken place. It takes more time to building up new business relationships, and thus, the trade effect of entry deregulation will materialize even in the longer run. The evidence supports the argument that outsourcing of service production towards Eastern Europe has extended the global value-added-chain for goods production.

Table 8: Outsourcing towards Eastern Europe: commercial and business service trade

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	(RAO)	(BTI)	(ABS)	(BC)	(SC)	(PROF)	(PROF-E)	(PROF-C)
Commercial Service Exports								
Time	0.857***	0.824***	0.863***	1.152***	0.661***	0.814***	0.822***	0.750***
	(0.121)	(0.124)	(0.137)	(0.285)	(0.116)	(0.116)	(0.121)	(0.0941)
Difference-in-difference								
T*EUij=1510	-0.518**	-0.931***	-0.607**	0.168	-0.127	-0.690***	-0.725***	-0.633***
	(0.249)	(0.213)	(0.236)	(0.411)	(0.316)	(0.183)	(0.167)	(0.173)
T*EUij=1015	-1.128***	-1.016***	-1.155***	-1.482***	-0.956***	-1.391***	-1.143***	-1.279***
	(0.194)	(0.241)	(0.218)	(0.311)	(0.207)	(0.174)	(0.170)	(0.160)
Difference-in-difference-in-differences								
T*EUij=1510*LIB$_t$	-0.346	0.291	-0.292	-0.950**	-0.810**	-0.228	-0.201	-0.441
	(0.286)	(0.270)	(0.277)	(0.426)	(0.348)	(0.272)	(0.399)	(0.313)
T*EUij=1015*LIB$_t$	0.268	0.0253	0.282	0.606*	-0.0991	0.925***	0.747**	0.662**
	(0.268)	(0.285)	(0.276)	(0.334)	(0.260)	(0.202)	(0.233)	(0.261)
N	3471	3471	3471	3471	3471	3471	3471	3471
Within R^2	.3296	.3280	.3300	.3661	.3431	.3371	.3279	.3372
Between R^2	.3327	.3250	.3314	.3218	.3204	.3153	.3208	.3165
Overall R^2	.3191	.3112	.3176	.3275	.3136	.3035	.3096	.3054
Business Service Exports								
Time	1.136***	1.091***	1.118***	1.478***	0.830***	1.018***	1.036***	0.987***
	(0.180)	(0.171)	(0.202)	(0.356)	(0.180)	(0.155)	(0.167)	(0.136)
Difference-in-differences								
T*EUij=1510	-1.024***	-1.063***	-1.134***	-1.386***	-1.238***	-1.091***	-1.034***	-1.027***
	(0.245)	(0.308)	(0.255)	(0.392)	(0.238)	(0.188)	(0.192)	(0.174)
T*EUij=1015	-1.203***	-0.972***	-1.153***	-1.872***	-1.036***	-1.460***	-1.152***	-1.337***
	(0.250)	(0.283)	(0.268)	(0.394)	(0.292)	(0.200)	(0.209)	(0.187)
Difference-in-difference-in-differences								
T*EUij=1510*LIB$_t$	0.117	0.131	0.246	0.446	0.183	-0.152	0.0503	-0.0474
	(0.292)	(0.331)	(0.315)	(0.418)	(0.303)	(0.277)	(0.449)	(0.394)
T*EUij=1015*LIB$_t$	0.437	-0.0124	0.284	0.979**	-0.0728	0.847***	0.793**	0.854**
	(0.320)	(0.324)	(0.344)	(0.426)	(0.360)	(0.228)	(0.349)	(0.369)
N	3167	3167	3167	3167	3167	3167	3167	3167
Within R^2	.6231	.6219	.6229	.6236	.6225	.6347	.6247	.6325
Between R^2	.3779	.3745	.3753	.3784	.3719	.3854	.3767	.3720
Overall R^2	.4327	.4303	.4328	.4362	.4312	.4391	.4356	.4310

Standard errors robust to heteroscedacity reported in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: The dependent variable is the log of exports of commercial services (business services respectively) in the period 2004-2010. See appendix A1 for services sectors and countries included. The dummy *EUij=1510* captures exports from the entire member states (country *i=EU15)* to Eastern Europe (country *j=EU10)* while the opposite export flow is considered in *EUij=1015.* The DD- and DDD-estimates of all remaining country groups (*intra-EU15, intra-EU10, otherRTA, RTAEUi, NoRTAEUi and NoRTAEUj*) are included in the regression and omitted for brevity. Estimates include pair-wise fixed effects and year dummies.

Robustness

Further robustness checks show whether the evidence remain relevant for policy conclusion. The following results stand out:

- First, deregulation (BC, SC, PROF, PROF-C) has to some extent negatively affected commercial service trade in the entire internal market of EU15. The negative trade effects disappear in specialized business services.
- Second, deregulating the professions lead to a deeper integration of the new member states and an increase in inter-EU commercial- and business service trade which is mainly driven by service trade flows from Eastern Europe towards the entire members.
- Third, the reorientation of EU10 business flows is associated with declining growth rates of intra-EU10 commercial- and business service intensities.
- And fourth, the service directive has not significantly diverted commercial- and business service trade from non-members which have negotiated a service trade agreement with the EU (*RTAEUi*). Instead of trade diversion, the service directive has contributed to external trade creation: the EU members import significantly more commercial- and business services from countries outside the bloc (*NoRTAEUj*), while service exports towards external partners (*NoRTAEUi*) decreases significantly.

As suggested by Baldwin and Taglioni (2006) including year dummies does not remove the time-series correlation of the multilateral trade resistance term. Model estimates with time-varying country dummies and pair effects can be found in the appendix A5. The significance of the time effect disappears in some specifications. The first result is not robust: the negative short term effects following deregulation in the EU15 is only supported for conduct regulation of professional services (PROF-C). Second, the increase of commercial and business service trade between EU15 and EU10 lose in significance (except for deregulating barriers to competition) although most of the coefficients tend to indicate a positive effect. A breakdown of inter-EU trade flows by direction of service delivery does not reinforce the results (not shown for brevity): neither east-west nor west-east service trade flows are significantly different in the post period compared to trade in the control group. An exception is the deregulation of *barriers to competition* which increases commercial service trade in both directions but even stronger from the new members towards the entire EU15 market. The third results stands out to be strong: the service market integration of the new member states goes hand in hand with declining intra-EU10 business intensities and tend to reflect the difficulties in developing a comparative advantage in service production vis-à-vis other transformation countries, and thus, cause a lower incentive to trade. Similar conclusions can be drawn for the fourth result: the service directive has overall not diverted trade from non-members which negotiated a service agreement with the EU. In addition, EU commercial service imports from all remaining non-members partners (without service agreement) are significantly higher in the post period, while EU business service exports

towards non-members decreases following service market liberalization as previously shown.

In appendix A6 we report respective estimates when excluding measures for the external trade effect to check for the robustness of the directive-induced intra-EU reallocations. The main argument for excluding *NoRTAEUi* and *NoRTAEUj* from the model can be seen in the extension of country pair observations within the control group which now represent all trade relationships with non service trade agreement. As suggested, the first result is not robust: the negative short term trade effects of deregulating market barriers on the entire market of EU15 disappear. However, increasing business trade between EU15 and EU10 remain robust following decreasing *barriers to competition (BC)*, *state control (SC)* and *professional service (PROF-C)* regulation. The third result of negative DDD-estimates for intra-EU10 business intensities stand out to be robust as well, irrespective of the regulation included. In addition, the coefficients of service RTAs and the *RTAEUi* dummy remain largely insignificant (with exception of *barriers to competition*) and validate that the EUs service directive has not affected business- and commercial service trade of external partners.

Another validity test with respect to the impact of the crisis on the trade pattern is simply excluding the most recent years. We estimate the sample for the period 2004 to 2008. According to appendix A7, negative trade effects from removing state control and deregulating professional service tend to be confirmed for intra-EU15 commercial and business service trade. Secondly, increasing business trade between EU15 and EU10 is only confirmed for removing *barriers to competition (BC)* as previously shown. However, the integration of EU10 into the market for business services seems to occur rather most recently (i.e. after the period of observation 2004 to 2008) because the DDD-estimator on deregulating the professions turns out to be insignificant. Thus, the trade-off between country-specific effects of the crisis and a shorter time span to adjust to liberalization induced by the directive seems to be obvious. However, negative trade effects on intra-EU10 business services trade are remarkably robust, as previously shown.

In this respect, the adjustment process following the liberalization of non-tariff barriers can even take a longer period than has been considered so far. A further concern arising in the light of the directives' trade impact is related to past liberalization (which is controlled for in the pair fixed effects). Nevertheless, we add a dummy (LIB_{t-1}*) for past deregulations (i.e. in the period 1998 and 2003) instead and find that liberalization prior to the proposal of the directive has already supported the integration process of the new member states into the internal market (appendix A8): inter-EU business service trade significantly increase due to deregulation (of *RAO* and *BC)* while commercial service trade is largely unaffected by previous deregulations.

The aim of the service directive is to foster bilateral service trade in the internal market, and thus, among those member countries which comply with the directive and deregulate barriers to trade. In this respect, a phase-in period is considered in the directive allowing member states to adopt relevant deregulations until the end of 2009. To account for the phase-in period in the DDD-estimates would require excluding the respective years of implementation (2007 to 2009) and compare the trade level in the post-implementation period to the pre2007 level when the service directive was negotiated. Despite the constraint that service trade data is currently available for year 2010 only, we find that those country pairs which comply with the service directive by deregulating market barriers within the implementation period (i.e. until 2008) experience overall positive trade effects. More in detail, regulatory reforms in the member states forces service providers in the internal market to trade more with partners in EU15 and EU10. As argued before, the reorientation of the new member states towards the EU15 – which is associated with declining intra-EU10 business intensities – tends to reflect that the new members develop rather a comparative advantage in service trade with the entire members than in trade with each other. Thus, complying with the directive's requirement of deregulating services markets pays off in terms of deeper integration of the new member states into the European single market. In addition, deregulating barriers is connected with an external trade creation effect instead of trade diversion. According to the evidence, members of the European Union trade (import as well as export) significantly more commercial- and business services with partner countries outside the bloc.

The evidence supports the argument by Baldwin (2011) and Gosh and Yamarik (2004b) that members of a trading bloc conduct more trade (inside and outside the bloc) the deeper the integration of the RTA. Previous studies evaluating *ex ante* the expected effects of the service directive suggest overall positive effects. We analyse *ex post* the effects of deregulating barriers in the internal market induced by the service directive. The evidence so far supports the results of simulation studies. We confirm an increase of exports of commercial- and business services in the new member states simulated by Gerlauff and Lejour (2006) and by O'Toole (2005). However, our results are not in line with the simulation by De Bruijn, Kox and Lejour (2006) and the new member's specialization towards manufacturing at the expense of decreasing commercial service value added. To the contrary, integrating the new member states into the internal market for services will augment their specialization pattern beyond the merchandise value-added-chain.

5 Conclusion

The enlargement process of the EU - with the new member states entering in 2004 - is followed by the target to deepen service market integration. The service directive concluded in 2006 aims at lowering barriers to the free movement of services providers in the internal market. The country-of-origin principle - which was the key element to facilitate cross-border services trade – and a long list of services sectors do not survived the draft. The literature so far has evaluated *ex ante* the expected trade effects of the service directive and concludes that removing heterogeneity in regulatory barriers affects intra-EU service trade positively albeit lower effects are expected when excluding the country-of-origin principle. Most evaluations neglect trade diverting effects in the European Union's trade with the rest of the world. Since Viner (1950) it is known that any regional trade agreement is a combination of trade creating and trade diverting effects. Investigating services trade agreements by including a RTA dummy has the shortcoming to account for the regulatory nature of service trade barriers. In this paper, we evaluate *ex post* the trade effects of the service directive by performing a *difference-in-difference-in-differences* estimator on a subset of commercial- and specialized business services trade in the period 2004 to 2010 accounting for liberalization of non-tariff barriers and endogeneity of RTA membership.

Our results underline the increasing tradability, and notably, the outsourcing potential of business services. In the European Union, this is supported by deregulating the professional services providers. First, liberalization has fostered the process of deeper integration of the new members into the European single market for services. Especially lowering barriers to conduct businesses is more trade creating in the short run than deregulating entry barriers which indicate that intensify existing business relationships is comparably easier than entering the market and building up new business relationships. Second, the service directive has rather induced commercial- and business services exports from Eastern Europe (especially the Visegrad-4 countries) into the entire EU market than in the opposite direction, and thus, extend the global value-added-chain for goods production towards the East. Accounting for the phase-in period confirms that deregulation tend to foster deeper integration of the new member states. Thirdly, the reorientation of the new member states is associated with declining intra-EU10 business intensities which suggest that a lower incentive to trade tend to be caused by the absence of comparative advantages vis-à-vis other transformation countries. In a similar way, commercial and business service trade on entire market of EU15 tends to be decreasing as well, although not robust to model specification. The negative (short term) trade effects turn into positive when taking the phase-in period into account, and suggest that deregulations need some time to become effective. Moreover, the evidence supports the argument that the European Union's aim of deeper service market integration goes beyond internal market. We find that deregulation of non-tariff trade barriers in the EU is associated with external trade creation as well.

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Appendices

Appendix A1.1: Classification of service sectors in balance of payments statistics

Code	Description	COM 2006
200	Total services	-
205	Transportation services	-
236	Travel services	-
245	Communication services	-
249	**Construction services**	COMEX
253	Insurance services	-
260	Financial services	-
262	**Computer and information services**	COMEX
268	**Other business services**	COMEX
269	Merchanting and other trade-related services	BUSEX
272	Operational leasing services	BUSEX
274	Legal, accounting, management and public relations services	BUSEX
278	Advertising, market research and public opinion polling	BUSEX
279	Research and development services	BUSEX
280	Architectural, engineering and other technical consultancy	BUSEX
281	Agricultural, mining, and on-site processing	BUSEX
285	Services between affiliated enterprises, n.i.e.	BUSEX

Source: Eurostat (2011a).

Appendix A1.2: Data coverage

Country	Eurostat BUSEX	Eurostat COMEX	Data Coverage in % Average annual (65 trading partner)	Data Coverage in% Average annual (30 PMR-countries)
			BUSEX	BUSEX
EU15				
Austria	2004-2010	2004-2010	92.1	**78.6**
Belgium	2004-06,08-10	2004-06,08-10	62.1	**60.0**
Denmark	2004-2010	2004-2010	90.3	**82.3**
Spain	-		-	**-**
Finland	2004-2010	2004-2010	49.0	**36.0**
France	2004-2010	2004-2010	81.9	**62.3**
Germany	2004-2010	2004-2010	94.8	**82.3**
Greece	2004-2010	2004-2010	85.5	**69.3**
Ireland	2004-2010	2004-2010	75.2	**64.8**
Italy	2004-2010	2004-2010	90.2	**82.5**
Luxembourg	2004-2009	2004-2010	97.0	**94.2**
Netherland	2004-2010	2004-2010	91.3	**72.8**
Portugal	2004-2010	2004-2010	75.5	**74.0**
Sweden	2004-2010	2004-2010	61.1	**50.6**
UK	-		-	-
EU10				
Poland	2004-2010	2004-2010	98.2	**93.1**
Czech Republic	2004-2010	2004-2010	91.6	**89.3**
Hungary	2004-2010	2004-2010	93.5	**82.2**
Slovak	2004-2010	2004-2010	96.8	**87.9**
Slovenia	2004-2010	2004-2010	86.3	72.4
Estonia	2004-2010	2004-2010	84.3	63.4
Latvia	2004-2010	2004-2010	53.8	36.1
Lithuania	2004-2010	2004-2010	89.9	59.6
Malta	2004-2010	2004-2010	72.0	67.7
Cypres	2004-2010	2004-2010	76.3	48.0
EXTRA-EU				
Bulgaria	2004-2010	2004-2010	94.8	83.1
Croatia	2004-2010	2004-2010	83.2	79.2
Iceland	2009-2010	2009-2010	94.9	**84.1**
Japan	2004-2010	2004-2010	98.2	**83.6**
Norway	2004-2009	2004-2009	95.8	**94.8**
Romania	2005-2010	2005-2010	95.7	74.8
Turkey	2008-2010	2008-2010	63.7	47.6
USA	-	2004-2009	-	-

Note: Bold numbers indicate that the respective country reports data on product market regulations.
Source: own calculations based on Eurostat (2011a).

Appendix A1.3: 65 vs. 30 trading partners

Albania	Estonia	Lithuania	Slovenia
Argentinia	**Finland**	**Luxembourg**	South Africa
Australia	**France**	Malaysia	**South Korea**
Austria	**Germany**	Malta	**Spain**
Belarus	**Greece**	**Mexico**	**Sweden**
Belgium	Hongkong	Morocco	**Switzerland**
Brazil	**Hungary**	**Netherlands**	Taiwan
Bulgaria	**Iceland**	**New Zealand**	Thailand
Canada	India	Nigeria	**Turkey**
Chile	Indonesia	**Norway**	Ukraine
China	Iran	Philippines	**United Kingdom**
Colombia	**Ireland**	**Poland**	**United States**
Croatia	Israel	**Portugal**	Uruguay
Cypres	**Italy**	Romania	Venezuela
Czech Republic	**Japan**	Russia	
Denmark	Latvia	Singapore	
Egypt	Liechtenstein	**Slovak Republic**	

Note: Bold countries report data on product market regulations.
Source: Eurostat (2011a)

Appendix A2: Description of variables and summary statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
LnCOMEX	9187	2.592	2.520	-5.809	9.410
LnBUSEX	8357	2.285	2.491	-5.809	9.370
$LnGDP_i$	15015	12.027	1.821	8.412	16.214
$LnGDP_j$	14519	12.041	1.618	7.929	16.214
$LnDistance_{ij}$	14784	8.006	1.110	2.134	9.880
$Border_{ij}$	14784	0.048	0.213	0	1
$Language_{ij}$	14784	0.045	0.207	0	1
intraEU25	15015	0.291	0.454	0	1
intraEU15	15015	0.105	0.306	0	1
intraEU10	15015	0.047	0.211	0	1
interEU	15015	0.140	0.347	0	1
RTAother	15015	0.010	0.098	0	1
RTAEUi	15015	0.045	0.207	0	1
NoRTAEUi	15015	0.431	0.495	0	1
NoRTAEUj	15015	0.083	0.276	0	1
Time	15015	0.571	0.495	0	1
T*intraEU25	15015	0.166	0.372	0	1
T*intraEU15	15015	0.060	0.237	0	1
T*intraEU10	15015	0.027	0.161	0	1
T*interEU	15015	0.080	0.271	0	1
T*RTAother	15015	0.006	0.079	0	1
T*RTAEUi	15015	0.030	0.171	0	1
T*NoRTAEUi	15015	0.243	0.429	0	1
T*NoRTAEUj	15015	0.047	0.211	0	1
LIB_t_RAO	5040	0.575	0.494	0	1
LIB_t_BTI	5040	0.550	0.497	0	1
LIB_t_ABS	5040	0.519	0.500	0	1
LIB_t_BC	5040	0.825	0.380	0	1
LIB_t_SC	5040	0.729	0.444	0	1
LIB_t_PROF	5040	0.355	0.478	0	1
LIB_t_PROF-E	5040	0.153	0.360	0	1
LIB_t_PROF-C	5040	0.350	0.477	0	1

Regional Trade Agreements for services (RTA) and liberalization of product market regulation (PMR)

intraEU25	=1 for a trading pair where both reporter and partner country are member of EU25
intraEU15	=1 for a trading pair where both reporter and partner country are Belgium, Denmark, Germany, Ireland, Greece, Spain, France, Italy, Luxembourg, Netherlands, Austria, Portugal, Finland, Sweden, UK
intraEU10	=1 for a trading pair where both reporter and partner country are Estonia, Latvia, Lithuania, Czech Republic, Hungary, Poland, Slovak Republic, Slovenia, Cyprus, Malta
interEU	=1 for a trading pair where the reporter country is member of EU15 (EU10) while the trading partner is member of EU10 (EU15)
RTAother	=1 for service RTAs between NAFTA countries (1994), EFTA countries (2002), EFTA-Mexico (2001), EFTA-Chile (2004), EFTA-Korea (2007), Japan-Singapore (2002), Japan-Mexico (2005), Japan-Malaysia (2006), Japan-Chile (2007), Japan-Thailand (2008), Japan-Indonesia (2009), Japan-Philippines(2009), Japan-Switzerland (2010), US-Chile (2004), US-Singapore (2004), US-Australia (2005), US-Morocco (2006)
RTAEUi	=1 for service-RTAs between EU-Mexico (2000), EU-Chile (2005), EU-Croatia (2005), EU-Bulgaria (2007), EU-Romania (2007), and EU-Albania (2009).
NoRTAEUi	=1 if exporter is member of EU while importer is not and has no agreement with the EU
NoRTAEUj	=1 if importer is member of EU while exporter is not and has no agreement with the EU
LIB_t_	=1 if reporter and partner country liberalize: regulatory and administrative opacity (RAO), explicit barriers to trade and investment (BTI), administrative burdens on start-ups (ABS), barriers to competition (BC), regulation on state control (SC), overall regulation for professional services (PROF), entry regulation (PROF-E), conduct regulation (PROF-C). Regulation data for 2003 and 2008 is available for: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, UK and the US.

Appendix A3: Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
														RAO_t	BTI_t	ABS_t	BC_t	SC_t	$PROF_t$	$PROF\text{-}E_t$	$PROF\text{-}C_t$
(1) Dist	1.00																				
(2) Border	-.36	1.00																			
(3) Lang	-.00	.20	1.00																		
(4) GDPi	-.11	.03	.09	1.00																	
(5) GDPj	.19	.03	.05	.01	1.00																
(6) intraEU25	-.58	.16	-.00	-.03	-.03	1.00															
(7) intraEU15	-.24	.15	.09	.17	.19	.53	1.00														
(8) intraEU10	-.27	.12	-.05	-.19	-.21	.34	-.08	1.00													
(9) interEU	-.29	-.00	-.05	-.07	-.08	.63	-.14	-.09	1.00												
(10) RTAEUi	.01	-.01	-.03	-.04	-.03	-.14	-.07	-.05	-.09	1.00											
(11) NoRTAEUi	.39	-.10	.05	-.04	.04	-.56	-.30	-.19	-.35	-.19	1.00										
(12) NoRTAEUj	-.04	-.03	-.03	.08	-.01	-.19	-.10	-.07	-.12	-.07	-.26	1.00									
(13) RTAother	.05	.03	.05	.06	.00	-.06	-.03	-.02	-.04	-.02	-.09	-.03	1.00								
(14) LIB_RAO$_t$	-.10	.08	-.02	.12	.16	-.07	-.05	-.00	-.02	.05	.02	.01	.08	1.00							
(15) LIB_BTI$_t$	-.20	-.01	-.07	-.10	-.05	-.01	-.14	.14	.10	.06	-.04	.03	.07	.14	1.00						
(16) LIB_ABS$_t$	-.06	.09	.02	.16	.13	-.10	-.10	.01	-.02	-.17	-.11	.02	.03	.59	-.14	1.00					
(17) LIB_BC$_t$	-.03	.05	-.11	.37	.28	.19	.08	.07	.13	.05	-.07	-.07	-.11	.11	-.17	.08	1.00				
(18) LIB_SC$_t$	-.07	.08	-.11	.06	.10	-.05	-.14	.09	.07	.04	-.19	.10	.05	.11	-.02	.20	.22	1.00			
(19) LIB_PROF$_t$	-.12	-.00	-.02	.11	.09	.24	.26	-.03	.01	-.12	-.01	.04	-.09	.13	-.24	.21	.11	.25	1.00		
(20) LIB_PROF-E$_t$	.03	-.02	.03	.11	.06	-.05	-.08	.04	.02	-.07	-.04	.07	-.05	-.11	-.09	.11	.20	.01	.34	1.00	
(21) LIB_PROF-C$_t$	-.06	.01	-.01	-.05	-.01	.10	.13	-.03	-.02	.10	.08	-.08	-.01	.12	-.25	.13	.00	.45	.65	.09	1.00
(22) LIB_RAO$_{t-1}$														.092							
(23) LIB_BTI $_{t-1}$															-.23						
(24) LIB_ABS $_{t-1}$																-.19					
(25) LIB_BC $_{t-1}$																	.673				
(26) LIB_SC $_{t-1}$																		.562			
(27) LIB_PROF $_{t-1}$																			-.110		
(28) LIB_PROF-E $_{t-1}$																				.103	
(29) LIB_PROF-C $_{t-1}$																					.323

Note: See appendix A1 and A2 for services, countries and PMR indicators.
Source: own calculations.

Appendix A4: Deregulation and intra-EU25 commercial- and business service export

	(1) (RAO)	(2) (BTI)	(3) (ABS)	(4) (BC)	(5) (SC)	(6) (PROF)	(7) (PROF-E)	(8) (PROF-C)
				Commercial Service Exports				
Time	0.861***	0.836***	0.862***	1.140***	0.644***	0.808***	0.831***	0.749***
	(0.119)	(0.120)	(0.135)	(0.285)	(0.116)	(0.113)	(0.117)	(0.0920)
T*intraEU25	-0.846***	-1.059***	-0.899***	-0.0255	-0.397**	-0.936***	-0.948***	-0.871***
	(0.145)	(0.131)	(0.150)	(0.331)	(0.142)	(0.119)	(0.109)	(0.0980)
T*RTAother	-0.406***	-0.352**	-0.357**	-0.653**	-0.146*	-0.283**	-0.313**	-0.213**
	(0.115)	(0.107)	(0.140)	(0.286)	(0.0879)	(0.0992)	(0.103)	(0.0837)
T*RTAEUi	-0.610	-0.988**	-0.836**	0.870**	0.305	-0.749**	-0.778**	-0.332
	(0.554)	(0.320)	(0.264)	(0.279)	(0.708)	(0.247)	(0.250)	(0.456)
T*NoRTAEUi	-0.769***	-0.996***	-0.690***	-0.426	-0.116	-0.752***	-0.813***	-0.636***
	(0.185)	(0.162)	(0.204)	(0.346)	(0.202)	(0.129)	(0.128)	(0.123)
T*NoRTAEUj	-0.0692	-0.0184	-0.129	-1.270**	-0.215	-0.337**	-0.202	-0.200*
	(0.194)	(0.193)	(0.205)	(0.578)	(0.314)	(0.125)	(0.138)	(0.103)
				Difference-in-difference-in-differences				
T*intraEU25*LIB$_t$	-0.119	0.236	-0.122	-0.991**	-0.780***	-0.139	0.0276	-0.358
	(0.176)	(0.170)	(0.178)	(0.338)	(0.182)	(0.151)	(0.218)	(0.224)
T*RTAother*LIB$_t$	0.227	0.103	0.127	0.450	-0.238*	0	0	-0.440**
	(0.151)	(0.147)	(0.168)	(0.296)	(0.142)	(.)	(.)	(0.223)
T*RTAEUi*LIB$_t$	-0.139	0.343	0	-1.725***	-1.325*	0	0	-0.916*
	(0.607)	(0.445)	(.)	(0.339)	(0.744)	(.)	(.)	(0.555)
T*NoRTAEUi*LIB$_t$	-0.0445	0.331	-0.201	-0.532	-1.013***	-0.493**	-0.136	-0.753**
	(0.223)	(0.214)	(0.234)	(0.360)	(0.237)	(0.229)	(0.279)	(0.265)
T*NoRTAEUj*LIB$_t$	-0.0810	-0.202	-0.00882	1.269**	0.0521	0.467**	0.412*	0.315
	(0.217)	(0.214)	(0.224)	(0.585)	(0.339)	(0.182)	(0.240)	(0.258)
N	3471	3471	3471	3471	3471	3471	3471	3471
groups	588	588	588	588	588	588	588	588
Within R^2	.3255	.3245	.3260	.3590	.3385	.3241	.3223	.3254
Between R^2	.3351	.3289	.3350	.3288	.3322	.3247	.3270	.3241
Overall R^2	.3214	.3164	.3208	.3316	.3235	.3104	.3154	.3111
				Business Service Exports				
Time	1.135***	1.079***	1.117***	1.468***	0.824***	0.985***	1.031***	0.956***
	(0.180)	(0.171)	(0.202)	(0.360)	(0.177)	(0.155)	(0.166)	(0.137)
T*intraEU25	-1.264***	-1.146***	-1.254***	-1.558***	-1.015***	-1.278***	-1.145***	-1.192***
	(0.187)	(0.175)	(0.208)	(0.377)	(0.175)	(0.150)	(0.157)	(0.130)
T*RTAother	-0.431*	-0.386*	-0.408*	-1.041**	-0.543**	-0.350**	-0.367*	-0.322
	(0.226)	(0.215)	(0.240)	(0.359)	(0.198)	(0.177)	(0.189)	(0.203)
T*RTAEUi	-1.309***	-1.272***	-1.152***	-0.760**	-0.708*	-1.060***	-1.077***	-1.037***
	(0.335)	(0.372)	(0.315)	(0.358)	(0.384)	(0.278)	(0.285)	(0.225)
T*NoRTAEUi	-1.147***	-1.046***	-1.126***	-1.057**	-0.638***	-0.923***	-0.960***	-0.848***
	(0.198)	(0.183)	(0.224)	(0.374)	(0.186)	(0.153)	(0.162)	(0.136)
T*NoRTAEUj	0.0830	0.117	0.0253	-0.721**	0.163	-0.350**	-0.152	-0.240
	(0.225)	(0.218)	(0.252)	(0.358)	(0.230)	(0.160)	(0.190)	(0.149)
				Difference-in-difference-in-differences				
T*intraEU25*LIB$_t$	0.342	0.0802	0.282	0.515	-0.225	-0.0744	0.148	-0.0131
	(0.211)	(0.190)	(0.243)	(0.392)	(0.240)	(0.161)	(0.319)	(0.323)
T*RTAother*LIB$_t$	0.189	0.0588	0.0624	0.870**	0	0	0	-0.334
	(0.288)	(0.269)	(0.309)	(0.386)	(.)	(.)	(.)	(0.394)
T*RTAEUi*LIB$_t$	0.429	0.295	0	-0.299	-0.576	0	0	-0.380
	(0.469)	(0.483)	(.)	(0.447)	(0.500)	(.)	(.)	(0.509)
T*NoRTAEUi*LIB$_t$	0.396*	0.171	0.268	0.0698	-0.532**	-0.619**	-0.131	-0.550
	(0.224)	(0.203)	(0.257)	(0.395)	(0.252)	(0.212)	(0.347)	(0.341)
T*NoRTAEUj*LIB$_t$	-0.349	-0.458*	-0.328	0.713*	-0.437	0.456**	0.344	0.487
	(0.261)	(0.247)	(0.290)	(0.391)	(0.306)	(0.222)	(0.392)	(0.371)
N	3167	3167	3167	3167	3167	3167	3167	3167
groups	571	571	571	571	571	571	571	571
Within R^2	.6215	.6209	.6215	.6222	.6209	.6270	.6212	.6257
Between R^2	.3775	.3791	.3766	.3800	.3734	.3925	.3796	.3798
Overall R^2	.4315	.4321	.4332	.4360	.4314	.4391	.4370	.4322

Standard errors robust to heteroscedacity reported in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The dependent variable is the log of exports of commercial (business) services in the period 2004-2010. See appendix A1 and A2 for services, countries and PMR indicators. Estimates include pair-wise fixed effects and year dummies.

Appendix A5: Robustness of DDD: Time-varying country fixed effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	(RAO)	(BTI)	(ABS)	(BC)	(SC)	(PROF)	(PROF-E)	(PROF-C)
				Commercial Service Exports				
Time	0.0469	-0.246	-0.565*	-1.435	-0.120	-1.681***	-1.511***	-1.757***
	(0.327)	(0.273)	(0.296)	(0.889)	(0.278)	(0.256)	(0.342)	(0.278)
T*intraEU15	-2.630***	0.897**	0.480	0.987***	1.186**	0.634**	0.661**	1.453**
	(0.477)	(0.404)	(0.345)	(0.295)	(0.412)	(0.320)	(0.324)	(0.576)
T*intraEU10	-3.025***	-	-	0.396	-	-	-	0.862
	(0.661)			(0.472)				(0.558)
T*interEU	-2.658***	0.865**	0.412	-	0.738**	0.435**	0.517**	1.281**
	(0.540)	(0.346)	(0.254)		(0.369)	(0.200)	(0.208)	(0.551)
T*RTAother	-0.198	-0.375	0.609	-0.635*	-0.183	-0.347	-0.297	-0.392
	(0.384)	(0.236)	(0.386)	(0.332)	(0.183)	(0.282)	(0.257)	(0.285)
T*RTAEUi	-3.070***	0.594	0.0402	0.904**	2.266***	-1.814***	0.374	-
	(0.589)	(0.377)	(0.416)	(0.435)	(0.611)	(0.456)	(0.414)	
T*NoRTAEUi	-3.081***	0.0893	-0.989***	0.601*	1.977***	-1.774***	0.129	-0.195
	(0.316)	(0.249)	(0.247)	(0.331)	(0.433)	(0.252)	(0.252)	(0.450)
T*NoRTAEUj	0.362	0.765**	1.326***	-1.326	-1.059**	2.016***	0.357	1.478***
	(0.480)	(0.366)	(0.269)	(0.839)	(0.488)	(0.386)	(0.261)	(0.380)
				Difference-in-difference-in-differences				
T*intraEU15*LIB$_t$	0.317	-0.00706	0.211	0.332	-0.264	-0.304	0.0984	-0.696**
	(0.238)	(0.256)	(0.244)	(0.360)	(0.278)	(0.290)	(0.333)	(0.336)
T*intraEU10*LIB$_t$	-0.588	-	-0.569	-	-	-1.561***	-1.133***	-1.991***
	(0.420)		(0.425)			(0.339)	(0.338)	(0.380)
T*interEU*LIB$_t$	0.151	-0.144	0.108	1.251**	0.126	-0.0650	0.259	-0.474
	(0.272)	(0.268)	(0.270)	(0.420)	(0.308)	(0.308)	(0.313)	(0.351)
T*RTAother*LIB$_t$	-0.0258	0.0935	-0.904*	0.684*	-0.191	-	-	-0.0599
	(0.404)	(0.312)	(0.471)	(0.389)	(0.314)			(0.455)
T*RTAEUi*LIB$_t$	0.567	-0.468	-	0.329	-0.479	-	-	-0.674*
	(0.416)	(0.314)		(0.376)	(0.324)			(0.392)
T*NoRTAEUi*LIB$_t$	0.197	-0.00819	0.122	0.0897	-0.517**	-0.467*	0.0540	-0.922**
	(0.240)	(0.222)	(0.257)	(0.235)	(0.194)	(0.241)	(0.319)	(0.320)
T*NoRTAEUj*LIB$_t$	0.0910	-0.156	0.141	1.928**	0.300	0.469*	0.366	0.284
	(0.271)	(0.278)	(0.268)	(0.889)	(0.480)	(0.280)	(0.299)	(0.277)
N	3471	3471	3471	3471	3471	3471	3471	3471
Within R^2	.7272	.7262	.7265	.7305	.7285	.7287	.7275	.7294
Between R^2	.2893	.0144	.2473	.1824	.0192	.2883	.0106	.0261
Overall R^2	.3099	.0000	.2562	.1017	.0317	.2882	.0000	.0035
				Business Service Exports				
Time	0.181	-1.061***	-1.930**	-1.276***	-1.452**	-0.411	-0.335	-1.226**
	(0.241)	(0.283)	(0.692)	(0.346)	(0.451)	(0.318)	(0.226)	(0.532)
T*intraEU15	-0.0173	0.614	0.404	0.314	0.409	0.259	0.231	0.545
	(0.320)	(0.409)	(0.989)	(0.239)	(0.567)	(0.303)	(0.301)	(0.759)
T*intraEU10	-		0.377	-0.0935	-0.805	-	-	0.338
			(1.059)	(0.374)	(0.613)			(0.801)
T*interEU	0.144	0.557	0.538	-	0.106	0.160	0.223	0.492
	(0.234)	(0.364)	(1.014)		(0.592)	(0.194)	(0.195)	(0.764)
T*RTAother	0.443	0.393	0.415	-0.999***	-	-0.356	-0.259	-0.464
	(0.403)	(0.401)	(0.406)	(0.239)		(0.450)	(0.422)	(0.475)
T*RTAEUi	-0.490	-0.617	0.533	0.0738	0.323	-0.831*	0.293	0.917
	(0.498)	(0.519)	(0.641)	(0.343)	(0.666)	(0.492)	(0.465)	(0.794)
T*NoRTAEUi	-1.133***	-1.681***	-0.250	-1.149***	-0.395	-1.003**	-0.263	-0.0643
	(0.227)	(0.305)	(0.425)	(0.179)	(0.464)	(0.321)	(0.188)	(0.572)
T*NoRTAEUj	1.329***	2.449***	0.805	1.378***	1.330***	1.118***	0.463**	0.609**
	(0.276)	(0.314)	(0.667)	(0.397)	(0.372)	(0.295)	(0.230)	(0.306)
				Difference-in-difference-in-differences				
T*intraEU15*LIB$_t$	0.167	-0.0723	0.0799	0.108	-0.696**	-0.298	0.492	-0.555**
	(0.260)	(0.255)	(0.339)	(0.284)	(0.287)	(0.255)	(0.454)	(0.267)
T*intraEU10*LIB$_t$	-0.889**	-	-0.935*	-	-	-1.668***	-1.048**	-1.996***
	(0.438)		(0.486)			(0.389)	(0.525)	(0.392)
T*interEU*LIB$_t$	-0.115	-0.0233	-0.204	0.440	-0.325	0.00283	0.561	-0.319
	(0.280)	(0.278)	(0.349)	(0.318)	(0.294)	(0.280)	(0.458)	(0.287)
T*RTAother*LIB$_t$	-0.823	-0.851	-0.763	1.336***	-0.487	-	-	0.693
	(0.614)	(0.619)	(0.613)	(0.290)	(0.420)			(0.625)
T*RTAEUi*LIB$_t$	0.466	-0.319	-	-0.222	-1.034**	-	-	-0.567
	(0.368)	(0.438)		(0.315)	(0.344)			(0.393)
T*NoRTAEUi*LIB$_t$	0.0112	-0.226	-0.107	0.107	-0.781**	-0.484**	0.440	-0.803**
	(0.253)	(0.246)	(0.340)	(0.233)	(0.238)	(0.231)	(0.443)	(0.257)
T*NoRTAEUj*LIB$_t$	-0.305	-0.255	-0.148	0.0906	-0.732**	0.304	0.276	0.0622
	(0.288)	(0.293)	(0.302)	(0.481)	(0.336)	(0.243)	(0.449)	(0.280)
N	3167	3167	3167	3167	3167	3167	3167	3167
Within R^2	.8310	.8299	.8310	.8305	.8309	.8320	.8312	.8323
Between R^2	.0098	.0364	.0071	.1203	.1308	.1956	.2054	.1223
Overall R^2	.0255	.0019	.0196	.0125	.0295	.0617	.0994	.0330

Standard errors robust to heteroscedacity reported in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. *Note:* The dependent variable is the log of exports of commercial (business) services in the period 2004-2010. See Appendix A1 and A2 for services, countries and PMR indicators. Estimates include time-varying country and pair fixed effects.

Appendix A6: Robustness of DDD: excluding dummies for trade diversion

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	(RAO)	(BTI)	(ABS)	(BC)	(SC)	(PROF)	(PROF-E)	(PROF-C)
				Commercial Service Exports				
Time	0.0834	-0.344	0.698**	-0.911	-1.000**	-0.175	0.654**	-0.619**
	(0.225)	(0.219)	(0.335)	(0.734)	(0.326)	(0.205)	(0.216)	(0.239)
T*intraEU15	0.0490	0.0898	0.0769	0.282	0.113	0.145	0.105	0.0913
	(0.200)	(0.182)	(0.177)	(0.403)	(0.239)	(0.229)	(0.164)	(0.194)
T*intraEU10	-0.348	-0.767**	-0.406	-0.777**	-0.755**	-0.491	-0.545*	-0.520
	(0.346)	(0.342)	(0.344)	(0.342)	(0.341)	(0.349)	(0.327)	(0.324)
T*interEU	0.0198	0.0562	0.00767	-0.664	-0.312	-0.0570	-0.0332	-0.0951
	(0.232)	(0.225)	(0.219)	(0.484)	(0.301)	(0.252)	(0.200)	(0.218)
T*RTAother	-0.188	-0.382*	0.642*	-0.573**	-0.509**	-0.277	-0.272	-0.274
	(0.385)	(0.223)	(0.389)	(0.288)	(0.163)	(0.244)	(0.257)	(0.270)
T*RTAEUi	-0.00173	0.518*	1.009**	0.559	0.398	0.225	0.270	0.205
	(0.497)	(0.292)	(0.369)	(0.368)	(0.356)	(0.315)	(0.323)	(0.422)
				Difference-in-difference-in-differences				
T*intraEU15*LIB_t	0.144	0.0350	0.0888	-0.176	0.0168	-0.0589	-0.0135	0.0450
	(0.149)	(0.155)	(0.134)	(0.366)	(0.208)	(0.252)	(0.241)	(0.199)
T*intraEU10*LIB_t	**-0.763****	-	**-0.691***	-	-	**-1.298*****	**-1.235*****	**-1.218*****
	(0.365)		(0.361)			(0.305)	(0.249)	(0.257)
T*interEU*LIB_t	-0.0225	-0.102	-0.0137	**0.720***	0.400	0.190	0.151	0.287
	(0.195)	(0.179)	(0.175)	(0.424)	(0.248)	(0.271)	(0.214)	(0.217)
T*RTAother*LIB_t	-0.121	0.145	**-0.993****	**0.587***	0.265	-	-	0.0619
	(0.406)	(0.293)	(0.477)	(0.330)	(0.292)			(0.405)
T*RTAEUi*LIB_t	0.385	**-0.439***	-	-0.0589	-0.128	-	-	0.106
	(0.359)	(0.248)		(0.346)	(0.268)			(0.273)
N	3471	3471	3471	3471	3471	3471	3471	3471
Within R^2	.7272	.7261	.7265	.7286	.7273	.7276	.7273	.7276
Between R^2	.1663	.2144	.2048	.1806	.0016	.0054	.2704	.2070
Overall R^2	.0426	.0660	.0906	.0571	.0161	.0175	.1356	.0956
				Business Service Exports				
Time	-1.666***	-0.770***	-1.084***	-1.623***	0.282	-1.834***	-0.189	-0.154
	(0.206)	(0.178)	(0.248)	(0.394)	(0.266)	(0.271)	(0.203)	(0.213)
T*intraEU15	-0.133	-0.0991	-0.0960	0.00858	-0.0435	-0.0233	-0.0256	-0.0413
	(0.190)	(0.179)	(0.187)	(0.233)	(0.190)	(0.189)	(0.171)	(0.187)
T*intraEU10	-0.108	-0.479	-0.120	-0.500	-0.497	-0.286	-0.259	-0.266
	(0.334)	(0.343)	(0.336)	(0.348)	(0.347)	(0.316)	(0.319)	(0.313)
T*interEU	0.0303	-0.155	0.0388	-0.305	-0.341	-0.126	-0.0358	-0.106
	(0.219)	(0.236)	(0.220)	(0.258)	(0.224)	(0.209)	(0.204)	(0.207)
T*RTAother	0.393	0.369	0.391	-0.914***	-0.235	-0.217	-0.213	-0.362
	(0.399)	(0.399)	(0.399)	(0.219)	(0.417)	(0.435)	(0.420)	(0.473)
T*RTAEUi	0.648	1.074**	0.794*	1.221***	0.689*	0.485	0.487	0.870**
	(0.448)	(0.428)	(0.434)	(0.299)	(0.396)	(0.437)	(0.425)	(0.414)
				Difference-in-difference-in-differences				
T*intraEU15*LIB_t	0.212	0.158	0.190	0.00671	0.0619	0.0224	0.101	0.103
	(0.138)	(0.136)	(0.129)	(0.184)	(0.145)	(0.174)	(0.191)	(0.154)
T*intraEU10*LIB_t	-0.847**	-	-0.825**	-	-	-1.334***	-1.442***	-1.312***
	(0.375)		(0.373)			(0.336)	(0.325)	(0.326)
T*interEU*LIB_t	-0.0695	0.207	-0.0931	0.339*	0.429**	0.331	0.169	0.354*
	(0.178)	(0.180)	(0.166)	(0.186)	(0.160)	(0.202)	(0.200)	(0.189)
T*RTAother*LIB_t	-0.685	-0.649	-0.673	1.232***	-	-	-	0.757
	(0.602)	(0.600)	(0.603)	(0.200)				(0.600)
T*RTAEUi*LIB_t	0.487*	-0.0913	-	-0.324	-0.275	-	-	0.121
	(0.287)	(0.379)		(0.221)	(0.250)			(0.323)
N	3167	3167	3167	3167	3167	3167	3167	3167
Within R^2	.8309	.8299	.8310	.8305	.8304	.8314	.8311	.8315
Between R^2	.0246	.0540	.1128	.1711	.2017	.0069	.1833	.2282
Overall R^2	.0076	.0023	.0025	.0606	.1076	.0169	.0885	.1161

Standard errors robust to heteroscedacity reported in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: The dependent variable is the log of exports of commercial (business) services in the period 2004-2010. See appendix A1 and A2 for services, countries and PMR indicators. Estimates include time-varying country and pair fixed effects.

Appendix A7: Robustness of DDD: time period 2004 to 2008

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	(RAO)	(BTI)	(ABS)	(BC)	(SC)	(PROF)	(PROF-E)	(PROF-C)
				Commercial Service Exports				
Time	0.320**	0.304**	0.322**	0.549**	0.0939	0.284**	0.326**	0.175*
	(0.117)	(0.115)	(0.133)	(0.247)	(0.140)	(0.116)	(0.125)	(0.0949)
T*intraEU15	-0.440**	-0.600***	-0.406**	-0.543**	-0.147	-0.425***	-0.497***	-0.331***
	(0.150)	(0.138)	(0.158)	(0.276)	(0.148)	(0.120)	(0.115)	(0.0992)
T*intraEU10	-0.369	-	-0.367	-0.325*	-	-0.362*	-0.366*	-0.262
	(0.250)		(0.263)	(0.174)		(0.193)	(0.193)	(0.183)
T*interEU	-0.145	-0.425**	-0.156	-0.912**	-0.196	-0.240*	-0.288**	-0.148
	(0.168)	(0.141)	(0.179)	(0.358)	(0.189)	(0.127)	(0.124)	(0.111)
T*RTAother	-0.653***	-0.532***	-0.504**	-0.652**	-0.190	-0.369**	-0.393**	-0.213**
	(0.107)	(0.125)	(0.180)	(0.247)	(0.118)	(0.119)	(0.127)	(0.102)
T*RTAEUi	0.127	-0.166	-0.206	0.207	0.723***	-0.167	-0.182	0.276*
	(0.298)	(0.595)	(0.232)	(0.239)	(0.135)	(0.206)	(0.209)	(0.158)
T*NoRTAEUi	-0.202	-0.414**	-0.146	-0.237	0.103	-0.265**	-0.290**	-0.159
	(0.145)	(0.165)	(0.159)	(0.261)	(0.173)	(0.119)	(0.121)	(0.107)
T*NoRTAEUj	-0.172	-0.126	-0.227	-1.029**	-0.128	-0.403**	-0.269*	-0.236**
	(0.192)	(0.187)	(0.206)	(0.458)	(0.241)	(0.133)	(0.140)	(0.106)
				Difference-in-difference-in-differences				
T*intraEU15*LIB$_t$	-0.00135	0.303*	-0.171	0.112	-0.465**	-0.0939	0.261	-0.611***
	(0.187)	(0.171)	(0.194)	(0.289)	(0.180)	(0.151)	(0.188)	(0.181)
T*intraEU10*LIB$_t$	-0.0762	-0.375**	-0.108	-	-0.485**	-0.344	-0.209	-0.873***
	(0.291)	(0.165)	(0.297)		(0.178)	(0.223)	(0.229)	(0.244)
T*interEU*LIB$_t$	-0.201	0.245	-0.248	0.750**	-0.124	-0.133	0.106	-0.637**
	(0.200)	(0.178)	(0.199)	(0.370)	(0.215)	(0.179)	(0.241)	(0.208)
T*RTAother*LIB$_t$	0.428**	0.255	0.232	0.366	-0.273	-	-	-0.815***
	(0.157)	(0.172)	(0.216)	(0.283)	(0.171)			(0.155)
T*RTAEUi*LIB$_t$	-0.362	0.0296	-	-0.352	-1.094***	-	-	-1.046**
	(0.382)	(0.613)		(0.311)	(0.250)			(0.332)
T*NoRTAEUi*LIB$_t$	-0.0929	0.268	-0.199	-0.0613	-0.547**	-0.150	0.0360	-0.624**
	(0.187)	(0.187)	(0.194)	(0.281)	(0.197)	(0.192)	(0.217)	(0.201)
T*NoRTAEUj*LIB$_t$	-0.0494	-0.154	0.0222	0.908*	-0.157	0.557**	0.325	0.0997
	(0.214)	(0.205)	(0.225)	(0.470)	(0.268)	(0.176)	(0.201)	(0.233)
N	2440	2440	2440	2440	2440	2440	2440	2440
Within R^2	.1585	.1593	.1631	.1586	.1550	.1531	.1486	.1546
Between R^2	.3322	.3332	.3310	.3249	.3267	.3330	.3287	.3337
Overall R^2	.3530	.3562	.3523	.3468	.3496	.3546	.3516	.3553
				Business Service Exports				
Time	0.364**	0.319*	0.343*	0.619**	0.0420	0.284*	0.323*	0.115
	(0.174)	(0.165)	(0.195)	(0.289)	(0.232)	(0.160)	(0.177)	(0.139)
T*intraEU15	-0.360*	-0.393**	-0.299	-0.578*	0.0285	-0.294*	-0.296*	-0.139
	(0.188)	(0.164)	(0.207)	(0.310)	(0.231)	(0.152)	(0.159)	(0.129)
T*intraEU10	-0.256	-	-0.227	-	-0.425**	-0.244	-0.211	-0.0951
	(0.221)		(0.245)		(0.168)	(0.183)	(0.193)	(0.168)
T*interEU	-0.223	-0.364**	-0.131	-0.630*	0.0790	-0.195	-0.182	-0.0367
	(0.197)	(0.178)	(0.221)	(0.322)	(0.243)	(0.153)	(0.164)	(0.133)
T*RTAother	-0.675***	-0.625***	-0.655***	-0.997***	-0.655***	-0.493**	-0.486**	-0.298
	(0.171)	(0.159)	(0.193)	(0.282)	(0.192)	(0.205)	(0.218)	(0.240)
T*RTAEUi	0.0629	0.394	-0.141	0.135	0.717**	-0.0917	-0.0826	0.213
	(0.396)	(0.425)	(0.257)	(0.283)	(0.222)	(0.214)	(0.223)	(0.218)
T*NoRTAEUi	-0.205	-0.215	-0.136	-0.179	0.279	-0.150	-0.136	-0.00665
	(0.191)	(0.176)	(0.218)	(0.293)	(0.236)	(0.150)	(0.161)	(0.133)
T*NoRTAEUj	-0.129	-0.0848	-0.184	-0.531*	0.143	-0.458**	-0.274	-0.265*
	(0.233)	(0.220)	(0.257)	(0.279)	(0.240)	(0.170)	(0.193)	(0.154)
				Difference-in-difference-in-differences				
T*intraEU15*LIB$_t$	0.205	0.223	-0.0370	0.351	-0.520**	-0.149	-0.0466	-0.721***
	(0.216)	(0.183)	(0.243)	(0.337)	(0.261)	(0.171)	(0.248)	(0.201)
T*intraEU10*LIB$_t$	0.00429	-0.209*	-0.121	-0.178	-	-0.458**	-0.333	-1.031***
	(0.257)	(0.113)	(0.283)	(0.179)		(0.213)	(0.234)	(0.237)
T*interEU*LIB$_t$	0.141	0.301	-0.128	0.543	-0.419	-0.150	-0.00131	-0.742***
	(0.218)	(0.189)	(0.246)	(0.347)	(0.269)	(0.196)	(0.258)	(0.223)
T*RTAother*LIB$_t$	0.405	0.260	0.287	0.713**	-	-	-	-0.820**
	(0.283)	(0.265)	(0.304)	(0.359)				(0.273)
T*RTAEUi*LIB$_t$	-0.102	-0.562	-	-0.186	-1.065***	-	-	-0.928**
	(0.435)	(0.453)		(0.352)	(0.304)			(0.353)
T*NoRTAEUi*LIB$_t$	0.160	0.126	-0.0301	0.000128	-0.684**	-0.302	-0.218	-0.756***
	(0.223)	(0.196)	(0.254)	(0.328)	(0.266)	(0.184)	(0.215)	(0.212)
T*NoRTAEUj*LIB$_t$	-0.168	-0.293	-0.148	0.355	-0.584**	0.683**	0.237	0.0838
	(0.272)	(0.252)	(0.297)	(0.328)	(0.293)	(0.234)	(0.301)	(0.278)
N	2311	2311	2311	2311	2311	2311	2311	2311
Within R^2	.2691	.2710	.2725	.2728	.2701	.2729	.2660	.2729
Between R^2	.3629	.3599	.3628	.3585	.3576	.3567	.3559	.3580
Overall R^2	.3923	.3907	.3933	.3915	.3911	.3859	.3901	.3872

Standard errors robust to heteroscedacity reported in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: The dependent variable is the log of exports of commercial (business) services in the period 2004-2008. See appendix A1 and A2 for services, countries and PMR indicators. Estimates include pair fixed effects and year dummies.

Appendix A8: Long term trade effects of deregulation

Liberalization of PMR in the period 1998 to 2003

	Commercial Service Exports					Business Service Exports				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
	(RAO)	(BTI)	(ABS)	(BC)	(SC)	(RAO)	(BTI)	(ABS)	(BC)	(SC)
Time	1.050**	1.011***	1.003***	1.268***	0.767***	2.014***	0.975***	1.269***	1.551***	1.111***
	(0.501)	(0.139)	(0.0846)	(0.278)	(0.160)	(0.228)	(0.180)	(0.168)	(0.348)	(0.188)
T*intraEU15	-1.122**	-1.163***	-1.195***	-1.040***	0.585**	-2.072***	-1.098***	-1.334***	-1.103***	-1.125***
	(0.509)	(0.166)	(0.101)	(0.0851)	(0.251)	(0.239)	(0.193)	(0.177)	(0.125)	(0.235)
T*intraEU10	-1.247**	-	-1.452***	-1.460***	-1.436***	-2.033***	-1.409***	-1.525***	-1.543***	-1.409***
	(0.536)		(0.238)	(0.334)	(0.252)	(0.190)	(0.257)	(0.272)	(0.377)	(0.264)
T*interEU	-1.109**	-0.973***	-0.982***	-1.402***	-0.440	-2.107***	-1.098***	-1.198***	-1.763***	-1.362***
	(0.518)	(0.239)	(0.141)	(0.311)	(0.340)	(0.273)	(0.271)	(0.218)	(0.377)	(0.250)
T*RTAother	-0.260**	-0.266**	-0.306***	-0.640**	-0.308**	-0.377**	-0.119	-0.335*	-1.035**	-0.386**
	(0.0898)	(0.130)	(0.0772)	(0.278)	(0.0978)	(0.177)	(0.0948)	(0.200)	(0.345)	(0.196)
T*RTAEUi	-0.998***	-1.039***	-0.910***	-1.288***	1.286***	-2.448***	-1.185***	-1.446***	-1.744***	-0.377**
	(0.162)	(0.202)	(0.216)	(0.313)	(0.153)	(0.323)	(0.263)	(0.291)	(0.394)	(0.181)
T*NoRTAEUi	-1.147**	-1.099***	-1.069***	-1.119***	0.496	-1.892***	-1.021***	-1.228***	-1.197**	-0.580**
	(0.520)	(0.169)	(0.118)	(0.305)	(0.329)	(0.248)	(0.199)	(0.185)	(0.366)	(0.215)
T*NoRTAEUj	-0.187	0.0737	-0.0618	-0.630**	-0.877	-1.179***	0.373	-0.267	-1.036**	-0.311
	(0.511)	(0.210)	(0.135)	(0.274)	(0.538)	(0.249)	(0.291)	(0.278)	(0.345)	(0.189)
	Difference-in-difference-in-differences									
T*intraEU15*LIB_{t-1}	0.00540	0.0903	0.223	-	-1.757***	0.889***	-0.0614	0.214	-	-0.0622
	(0.506)	(0.197)	(0.183)		(0.269)	(0.204)	(0.247)	(0.251)		(0.285)
T*intraEU10*LIB_{t-1}	-0.704	-1.398***	-	-0.440	-	-	-	-	-0.397	-
	(0.586)	(0.241)		(0.420)					(0.402)	
T*interEU*LIB_{t-1}	0.164	-0.0116	-0.140	0.534	-0.622*	1.039***	-0.0244	-0.152	0.828**	0.215
	(0.531)	(0.280)	(0.279)	(0.342)	(0.359)	(0.282)	(0.331)	(0.331)	(0.419)	(0.307)
T*RTAother*LIB_{t-1}	-	-0.0506	0.0719	0.483	-	-	-0.497**	-	0.953**	-
		(0.157)	(0.157)	(0.294)			(0.172)		(0.364)	
T*RTAEUi*LIB_{t-1}	-	-	-0.150	-	-2.333***	1.195**	-	0.147	-	-0.957**
			(0.326)		(0.229)	(0.371)		(0.436)		(0.301)
T*NoRTAEUi*LIB_{t-1}	0.219	0.176	0.238	0.167	-1.551***	0.850***	0.0163	0.328	0.166	-0.496*
	(0.519)	(0.208)	(0.195)	(0.322)	(0.347)	(0.219)	(0.256)	(0.259)	(0.389)	(0.273)
T*NoRTAEUj*LIB_{t-1}	0.164	-0.143	0.0438	0.654**	0.804	1.121***	-0.565	0.239	1.041**	0.212
	(0.511)	(0.243)	(0.206)	(0.290)	(0.549)	(0.250)	(0.351)	(0.349)	(0.382)	(0.271)
N	2884	2884	2884	2884	3185	2658	2658	2658	2658	2893
groups	495	495	495	495	495	478	478	478	478	523
Within R^2	.5015	.5010	.5019	.5022	.3927	.6651	.6652	.6651	.6674	.6616
Between R^2	.3539	.3557	.3544	.3534	.3181	.3907	.3915	.3874	.3835	.3737
Overall R^2	.3743	.3741	.3745	.3745	.3241	.4561	.4559	.4556	.4548	.4375

Standard errors robust to heteroscedacity reported in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The dependent variable is the log of exports of commercial (business) services in the period 2004-2010. See appendix A1 and A2 for services, countries and PMR indicators. Estimates include pair fixed effects and year dummies.

Appendix A9: Robustness of DDD: accounting for the phase-in period (2007-2009)

	(RAO)	(BTI)	(ABS)	(BC)	(SC)	(PROF)	(PROF-E)	(PROF-C)
				Commercial Service Exports				
Time	-0.478**	-2.022***	-1.392**	-3.074**	-3.955***	-0.538**	-2.269***	-2.695***
	(0.181)	(0.465)	(0.491)	(1.145)	(1.159)	(0.239)	(0.240)	(0.615)
T*intraEU15	-0.427	-1.501**	-0.464	-1.246	0.432	1.129	-0.710	-1.005*
	(0.561)	(0.455)	(0.375)	(1.081)	(1.055)	(1.465)	(0.757)	(0.609)
T*intraEU10	0.654	-	-	-	-	-2.659***	-	-
	(1.027)					(0.643)		
T*EUij=1510	0.720	1.155**	0.240	-0.0693	1.754**	-2.130***	0.680*	0.506
	(0.845)	(0.570)	(0.508)	(1.020)	(0.793)	(0.595)	(0.380)	(0.362)
T*EUij=1015	-0.499	-1.620**	-0.647	-2.767**	-0.313	0.793	-0.940	-1.276**
	(0.644)	(0.508)	(0.406)	(1.163)	(1.058)	(1.486)	(0.715)	(0.610)
T*RTAEUi	-	0.187	0.214	-0.683	-	-	-0.206	-2.127**
		(0.658)	(0.693)	(0.693)			(0.511)	(0.766)
T*NoRTAEUi	-0.324	-1.844***	-1.004**	-1.126**	-0.756**	-1.257**	-1.451***	-2.727***
	(0.775)	(0.491)	(0.453)	(0.394)	(0.365)	(0.422)	(0.289)	(0.632)
T*NoRTAEUj	-0.618	-	-	-4.852***	-	-	-	-
	(1.075)			(1.099)				
				Difference-in-difference-in-differences				
T*intraEU15*LIB$_t$	1.880**	0.936**	1.672**	0.469	-0.726	0.0328	-0.149	0.378
	(0.849)	(0.316)	(0.834)	(0.651)	(0.650)	(0.386)	(0.389)	(0.375)
T*intraEU10*LIB$_t$	-	-	-	-	-	-2.845***	-3.218***	-2.553***
						(0.495)	(0.421)	(0.453)
T*EUij=1510*LIB$_t$	2.252**	-	2.083**	1.559*	-0.262	0.260	-0.886	0.581
	(0.938)		(0.897)	(0.896)	(0.773)	(0.524)	(0.653)	(0.507)
T*EUij=1015*LIB$_t$	1.701**	0.690*	1.680**	1.843**	-0.0823	0.437	0.188	0.709*
	(0.831)	(0.406)	(0.818)	(0.818)	(0.702)	(0.458)	(0.369)	(0.411)
T*RTAEUi*LIB$_t$	2.897**	-0.541	-	0.790	-0.563	-	-	0.867
	(1.118)	(0.654)		(0.704)	(0.755)			(0.577)
T*NoRTAEUi*LIB$_t$	1.682*	0.623*	1.634*	-0.0853	-1.148	-0.175	-0.127	-0.0464
	(0.858)	(0.359)	(0.842)	(0.267)	(0.700)	(0.285)	(0.347)	(0.273)
T*NoRTAEUj*LIB$_t$	-	-	-	5.107***	1.485	2.430*	0.583	2.030*
				(0.779)	(1.042)	(1.407)	(0.724)	(1.149)
N	1942	1942	1942	1942	1942	1942	1942	1942
Within R^2	.7328	.7317	.7298	.7401	.7346	.7379	.7347	.7374
Between R^2	.0004	.0188	.0046	.0184	.0007	.0340	.0026	.0001
Overall R^2	.0250	.0432	.0023	.0231	.0136	.0586	.0226	.0172
				Business Service Exports				
Time	-1.129***	-1.383**	-1.497***	0.753	-0.170	-1.408**	-0.546	-1.376***
	(0.280)	(0.611)	(0.400)	(0.885)	(0.637)	(0.440)	(0.379)	(0.378)
T*intraEU15	0.298	-0.384	-1.225**	-2.088*	-3.086**	-0.330	-0.567	-0.331
	(0.477)	(0.612)	(0.488)	(1.072)	(0.972)	(0.430)	(0.369)	(0.388)
T*intraEU10	-	-	-2.519***	-	-	-0.283	-2.032***	-
			(0.617)			(0.696)	(0.553)	
T*EUij=1510	0.835**	1.372**	-2.295***	1.422**	-0.536*	0.308	-1.215**	0.569
	(0.378)	(0.512)	(0.593)	(0.516)	(0.323)	(0.610)	(0.442)	(0.383)
T*EUij=1015	0.115	-1.170*	-1.528**	-3.396**	-4.075***	-1.123**	-1.212**	-1.025**
	(0.456)	(0.694)	(0.572)	(1.125)	(1.125)	(0.527)	(0.471)	(0.384)
T*RTAEUi	-	-	-	-	-	-	-	0.830
								(0.518)
T*NoRTAEUi	0.441	-0.249	-1.304**	-0.548	-0.895*	-0.759	-0.451	-0.954**
	(0.534)	(0.650)	(0.531)	(0.419)	(0.499)	(0.482)	(0.401)	(0.335)
T*NoRTAEUj	-	-	-	-2.763***	-4.019**	-	-	-
				(0.781)	(1.260)			
				Difference-in-difference-in-differences				
T*intraEU15*LIB$_t$	0.884**	0.480	2.000**	-0.745	0.712	-0.521	-0.452	0.517
	(0.406)	(0.537)	(0.671)	(0.669)	(0.645)	(0.394)	(0.357)	(0.372)
T*intraEU10*LIB$_t$	-1.489**	-	-	-	-	-2.721***	-3.102***	-1.772***
	(0.682)					(0.529)	(0.459)	(0.466)
T*EUij=1510*LIB$_t$	-	-	2.239**	-	2.092**	0.336	-0.784	1.327**
			(0.757)		(0.652)	(0.546)	(0.574)	(0.529)
T*EUij=1015*LIB$_t$	0.231	0.612	1.467**	-	1.242*	-0.0852	-0.167	0.798*
	(0.469)	(0.603)	(0.649)		(0.725)	(0.475)	(0.422)	(0.410)
T*RTAEUi*LIB$_t$	3.201***	1.073	-	-	0.866	-	-	0.729
	(0.704)	(1.294)			(0.848)			(0.777)
T*NoRTAEUi*LIB$_t$	0.565	0.125	1.904**	-0.431*	1.143*	-0.508**	-0.428	0.240
	(0.447)	(0.530)	(0.684)	(0.242)	(0.689)	(0.254)	(0.288)	(0.265)
T*NoRTAEUj*LIB$_t$	-	-	-	0.689	1.449*	0.194	-0.596	1.001*
				(0.423)	(0.859)	(0.663)	(0.469)	(0.563)
N	1838	1838	1838	1838	1838	1838	1838	1838
Within R^2	.8305	.8247	.8277	.8243	.8262	.8290	.8278	.8296
Between R^2	.0140	.0012	.0222	.0016	.0434	.0529	.0000	.0085
Overall R^2	.0536	.0509	.0828	.0377	.0072	.0097	.0421	.0496

Standard errors robust to heteroscedacity reported in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. *Note:* The dependent variable is the log of exports of commercial (business) services in the period 2004-2010. The phase-in period (2007 to 2009) is excluded. Estimates include time-varying country and pair fixed effects.