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01. September 2008

Online at <http://mpra.ub.uni-muenchen.de/11441/>

MPRA Paper No. 11441, posted 06. November 2008 / 19:55

# Working Paper

## The Internal Market for Services of the European Union – Evidence from OECD-Panel Data

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\* We are grateful to Wolfgang Cezanne for valuable discussions, and to Mihaela Tabacaru and Steffen Jenkel who provided helpful assistance.

## **Abstract**

The European Union service sector hampers many regulations by the Member States. For this reason, the European Commission issued a directive to reduce regulations and raise competition. We update the study from Kox, Lejour and Montizaan (2005) with the latest changes of the directive on services o the internal market. Based on OECD-Panel data, we are able to develop a linear service trade model to investigate the economic benefit of such a directive. Our results show that the volume of service trade would decline with a between 2.6%-5.4%. This surprising outcome is contrary to previous results from Kox, Lejour and Montizaan (2005) or Breuss and Badinger (2005). We show that this is due to the latest modification in the service directive.

**Keywords:** Regulatory Barriers; OECD Panel Data; Service Trade; European Union

**JEL classification codes:** C23, F12, O52

## Introduction

For most European Union (EU) Member States<sup>1</sup>, services have been found to be important for economic growth and account for 70% of GDP and employment (European Parliament 2006). Despite this fact, barriers still hamper the internal market for services of the EU. To overcome these barriers, the European Parliament issued a directive on services in December 2006 with the aim to remove such barriers.

This paper investigates the potential economic benefit that would result from the implementation of this directive. In order to test this, a linear service trade model, based on an economic gravity equation and monopolistic competition theory, is introduced. Using indicators for the quantity of national regulations in the calculation reveals the impact of these regulations on the internal service trade. Applying the directive on these indicators will reveal the effect of the directive on the service trade in the EU.

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<sup>1</sup> Note that European Union Member States and Member States will be used interchangeably throughout this article.

## 1 Background Information

In March 2000, the European Council held a special meeting in Lisbon. The aim of the meeting was “to agree on a new strategic goal for the Union in order to strengthen employment, economic reform and social cohesion as a part of a knowledge-based economy” (Lisbon European Council 2000, introduction). An important point from this meeting was the discussion about an economic reform for the internal market. They decided, “to set out by the end of 2000 a strategy for the removal of barriers to services” (Lisbon European Council 2000, point 17).

In December 2000, the European Commission issued a strategy-paper for the internal market for services (European Commission 2000), which contains a two stage approach for the removal of regulation barriers. The first stage analyses the internal market and identifies barriers to the free movement of services. A report by the Commission of the European Communities (European Commission 2002) concluded this first stage. The report summarises barriers to the internal market for services, the common features of the legal barriers and the impact of the barriers. The aim of the second stage of the approach is to develop appropriate solutions for the barriers identified in Stage 1. Issuing a proposal for a directive on services (European Commission 2004) accomplished this second stage. The proposed directive provides a legal framework encompassed of 47 articles to eliminate obstacles for the freedom of establishment and the free movement of services and to raise the mutual trust between EU Member States.

In April 2006, the European Commission issued an amended proposal of the

directive (European Commission 2006), and in December 2006, they issued the final directive on services (European Parliament 2006).

## **2 The Internal European Market for Services**

The service sector of the EU in 2003 encompassed around 65% of the total GDP and around 68% of the total employment of the Member States. Table 1, which is based on a study by Vogt (2005), shows that the shares from total GDP of the 12 EU Member States varies from 50% for Ireland, up to 92.7% for Luxembourg. The service shares on total employment are higher and their variation is lower than the ones for GDP. They stretch from 59.7% for Portugal up to 77.7% for Netherlands. Despite these high values, the shares for services in the EU were approximately 11% less than those in the UK and the USA.

\*\*\*\* TABLE 1 \*\*\*\*

The European Commission (2003) has also described other significant characteristics of cross-border service activities. They mention that services account for just 20% of trade in the internal market, even though 90% of Small and Middle Enterprises (SME) are service industries. In addition, 40 % of business services providers say that eliminating barriers to cross-border trade would increase revenues by up to 20%.

## *2.1 Barriers*

Barriers for the internal market for services, hinders providers and consumers to benefit from an open internal market and unlimited competition. These barriers can be derived from both legal and non-legal factors ( European Commission 2002).

Legal barriers contain quantitative restrictions, residence and/ or registration requirements. There are many examples of this. Some Member States could fail to recognize that requirements were met, if a service provider in another Member State did them. Administrative burdens and prior authorisation of certain services could hamper the promotion of services. The requirement that providers must have an establishment in the Member State in which they deliver services could also hinder the distribution of services. Other barriers include the formation and the content of contracts, price regulations, rules and practices, in relation to payment and accounting rules. There could be differences between Member States in terms of rates, obligations, procedures or forms, which result in difficulties for intra-European trade. Professional liability insurance schemes, which may vary between Member States, could also hamper cross-border service trade.

Non-legal barriers arise due to lack of information or differences in culture between Member States. Thereby, missing knowledge about rights, applicable national rules, competent authorities, procedures and formalities could relate to a lack of information. Commercial and consumer habits, which derive from the difference in language, values and habits of a specific country, could also cause difficulties.

## *2.2 EU Service Directive*

In 2006, the European Parliament issued a final directive on services in the internal market (European Parliament 2006). The aim of this directive is to reduce barriers of the internal market for services of the EU, described in the report by the European Commission. The directive contains measures that target to simplify administration, reduce barriers to the freedom of establishment, reduce the free movement of services, and increase the quality of services and administrative cooperation. It is a dynamical approach with time for the removal of barriers and evaluation to achieve a genuine internal market for services by 2010 (European Parliament 2006, point (7), p. L.376/37).

## *2.3 Application of the Monopolistic Competition Theory*

To test if the theory of monopolistic competition can be applied to the internal market for services of the EU, the characteristics of this market must be the same as the one of monopolistic competition. That means product differentiation, economies of scale, and barriers to entry should exist in the internal market. If they exist, then a reduction of barriers to entry could induce other enterprises to enter the market, potentially leading to more competition with increasing quantity of products, decreasing product prices and raising demand.

Product differentiation in services is an important strategical factor for all companies, because it accounts for most of the cost. Companies use services for communications, transportation, health care, wholesale and retail distribution, and financial services (Quinn, Doorley and Paquette 1990, p. 58). It also creates



additional value for customers, and it is reasonable to assume that if customers are satisfied with the quality of services or the service products of a company, they will remain a loyal customer of this company. Furthermore, it is also a condition for the service industries to have a sustainable competitive advantage. A sustainable company advantage exists when resources or skills for services are valuable, rare, inimitable and when there is no strategically equivalent substitute (Bharadwaj, Varadarajan and Fahy 1993, p. 84). These requirements describe product differentiation.

Economies of scale involves decreasing average production costs by increasing the scale of production, or learning by doing. Various studies have proved the existence of such learning by doing procedures in the service sector (e.g. von Hippel and Tyre 1999; Canback 1998). According to Cezanne (2006, p. 164) and Cezanne and Weber (2005), obstacles to enter a market can be institutional or economical barriers, such as import restrictions, governmental restrictions and sunk costs. These costs are the difference of acquirement costs to the value of resale of necessary fixed costs for a market entry or lack of information.

The report made by the European Commission (2002) describes such barriers. As mentioned in chapter two of that report, many legal and non-legal barriers to entry exist in the Member States, whereby legal barriers correspond to institutional barriers. As an example, there are quantitative restrictions for the establishment of service providers in Member States other than their state of origin. Member States can limit the number of service providers or require registration. Economic barriers arise from the institutional or legal barriers. These barriers lead to (higher) transaction costs,

which, in turn, lead to higher average costs and higher prices. They also represent sunk costs. The existence of these institutional and economic barriers leads to limited competition on national service markets, and on the internal market for services, which consists of these national markets.

The above-mentioned requirements of monopolistic competition actually exist currently on the internal market for services of the EU, as we have proven so far. To take this theory one step further, a reduction of barriers to entry will encourage other enterprises to enter the market, which would lead to more competition. Through the implementation of the directive on services with the aim to reduce barriers to entry of the Member States, competition on the internal market for services could raise and the national service markets of the Member States could become more contestable markets. Following this approach, there should be a negative connection between barriers to entry and service trade: the assumption is that the lower the barriers, the higher the amount of trade in the service industry.

#### *2.4 Regulatory Indicators*

In 2003, the OECD released a 'Regulatory Indicators Questionnaire' to analyse product market regulations in the OECD countries. Several governmental administrations answered took part. The questionnaire covered general regulatory framework policies and specific regulations in many sectors. The OECD sent the questionnaire to all OECD Member States and their representatives.

The responses from the questionnaire encouraged the creation of the OECD International Regulation Database (2003). This database classifies regulation data

into high-level, mid-level and low-level indicators. Figure 1 represents this classification for high-level and mid-level indicators.

\*\*\*\* FIGURE 1 \*\*\*\*

Classification (Figure 1) divides regulations in two high-level indicators: *inward-* and *outward-oriented policies*. Furthermore, the indicator inward-oriented policies are divided in two mid-level indicators: *state control* and *barriers to entrepreneurship*. The mid-level indicator of outward-oriented policies is *barriers to trade and investment*. For further analysis, these mid-level indicators are divided in sub-domains (see figure 2). *State control* represents the sub-domains of *public ownership* and *involvement in business operations*. The sub-domains of barriers to entrepreneurship are *regulatory and administrative opacity*, *administrative burdens on start-up* and *barriers to competition*. The sub-domains of *barriers to trade and investment* are *explicit barriers to trade and investment* and *other barriers*.

\*\*\*\* FIGURE 2 \*\*\*\*

Following the structure of the OECD database with sub-domains of the mid-level indicators, table 2 gives a detailed summary of the collected items per sub-domain. In total, there are 124 items answered by representatives from OECD

countries. The sub-domains of public ownership with 22.58% and involvement in business operation with 16.13% sum to 38.71%. This represents the mid-level indicator state control. The mid-level indicator barriers to entrepreneurship total 47.58% (8.87% for regulatory and administrative opacity, 17.74% for administrative burdens on start-up, and 20.97% for barriers to competition). The remaining 13.71% belongs to the mid-level indicator barriers to trade and investment, consisting of 10.48% for explicit barriers to trade and investment, and 3.23% for other barriers.

It is important to note that the indicator *other barriers* contains only 3.23% of all data, which are four items from the 124. This may not be representative for this indicator. Therefore, subsequent calculations do not consider this sub-domain.

\*\*\*\* TABLE 2 \*\*\*\*

We apply the methodology for bilateral regulatory indicators, described in the annex, on the data from the OECD. The comparison contains 15 EU Member States, namely Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom. Calculating the average regulatory indicator per country pair gives comparable values for each Member State.

The average indicator is:

$$(1) \quad ARICP_{ij} = \frac{1}{K} \sum_s \sum_m BRI_{ij}^{m,s}$$

$K$  ( $K \in N$ ) represents the number of items per domain/sub-domain.  $BRI_{ij}^{m,S}$  is a bilateral regulatory indicator at question  $m$  with the way  $s$  of dealing with the question for the country pair  $i$  and  $j$ . The assignment of values to this bilateral regulatory indicator is as follows: if two countries differ at Yes-or-No, or a) or b) questions, the actual indicator gets the value 1; otherwise, if they have the same answer, it gets the value 0. If the question allows for more than two answers, then the indicator gets the value 1 if there is a total difference between the two countries. Otherwise, the indicator gets a value between 0 and 1, depending on how many answers these questions allow and how much do the answers of the two countries differ. E.g., if there are three possible answers to one question, and both countries have one identical and one different answer, then the indicator gets the value 0.66. If the answers are numbers, then if the destination country has the highest number of all countries, the indicator gets the value one. The indicators for the other country pairs get a value between zero and one, which depends on the number of the destination country in relation to the highest number.

The assigning of values for the average regulatory indicator for each question per country pair builds up for the 15 Member States. The result is a 90x124 matrix, because of the combination of Belgium and Luxembourg, due to missing data for Luxembourg.

For the calculation of the average indicator, the values are summed up for each sub-domain per country pair. Dividing the sums by  $K$ , the count of all questions in the actual sub-domain gives the average regulatory indicators per country pair for

each sub-domain. These indicators take values between 0 and 1, and the values for the country pairs are comparable for each sub-domain. Following this structure, the average indicators for all pairs of the 15 Member States per sub-domain are calculated (the sub-domain 'other barriers' is left out). An example of the construction of the *ARICP* is shown in table 3.

\*\*\*\* TABLE 3 \*\*\*\*

### *2.5 The Impact of the Service Directive*

The estimation of the impact of the directive on services uses the sub-domain structure of the data. Three impact cases appear:

- the directive affects the comparison item and leads to less heterogeneity;
- the directive could affect the item and lead to less heterogeneity; and
- the directive does not affect the item.

The second case leads to the creation of a bandwidth with a minimum and maximum effect. Applying the directive on the data and considering the three cases, results in the calculation of two new matrices, each with the dimension 90x124, one for the calculation of the minimum effect of the directive and the second for the calculation of the maximum effect. Table 4 gives the bandwidth of the impact of the directive per domain/sub-domain.

The directive on services affects the sub-domain regulatory and administrative opacity heavily, with a possible reduction from 79% to 91%. Public ownership, involvement in business operation, administrative burdens on start-up and explicit barriers to trade and investment are moderately affected. Public ownership could decline by 11% and involvement in business operations by 0% to 23%. The possible reduction of administrative burdens on start-up takes values from 0% to 15% and the sub-domain of explicit barriers to trade and investment is around 17%. Barriers to competition are not affected. The directive could lead to a total reduction of barriers by 11% to 19%.

\*\*\*\* TABLE 4 \*\*\*\*

### 3 Model and Data

The base of the linear service trade model is an economic gravity equation, which is:

$$(2) \quad F_{ij} = G \frac{M_i^\alpha M_j^\beta}{D_{ij}^\delta}$$

where

$F_{ij}$  is the Flow from Origin  $i$  to Destination  $j$

$M_i, M_j$  is the Relevant Economic Sizes of the Origin and Destination

$D_{ij}$  is the Distance Between the Two Entities

$G$  is a Constant

To apply this equation on the internal market for services of the EU, bilateral service trade represents the flow from the country of origin to destination country. The GDP of both countries gives an indication of their economies of size. If we use this notation and apply the natural logarithm on the gravity equation, we get the linear equation:

$$(3) \quad \ln(BST_{ij}) = \ln(G) + \alpha \ln(GDP_i) + \beta \ln(GDP_j) - \delta \ln(D_{ij}).$$

where:

$BST_{ij}$  is the Bilateral Service Trade from Country  $i$  to Country  $j$

$GDP_i$  is the Gross Domestic Product of the Origin Country  $i$

$GDP_j$  is the Gross Domestic Product of the Destination Country  $j$

$D_{ij}$  is the Distance Between Country  $i$  and Country  $j$

$G$  is a Constant

The next step is the augmentation of this equation with the average regulatory indicators. This is necessary for the estimation of the impact of the directive on bilateral service trade between the Member States. The monopolistic competition theory gives the theoretical foundation of this augmentation, as it describes a link between barriers to entry and trade. In our study, the average regulatory indicators per country pair represent barriers to entry for the internal market for services. Reducing



these barriers leads to more competition with more service trade and lower product prices. That means that reducing average regulatory indicators should raise competition, whereby bilateral service trade should increase. This is because actual regulations hamper foreign service providers more than native providers, and a reduction of these regulations attracts more foreign providers to enter domestic markets and to participate in the competition.

Because the estimation of the impact of the directive is based on data for three different years (2001 to 2003), this augmentation also introduces two dummy variables. These help to distinguish the data for different years.

The linear service trade model is represented by the following equation:

(4)

$$\ln(BST_{ij}) = \ln(G) + \alpha \ln(GDP_i) + \beta \ln(GDP_j) - \delta \ln(D_{ij}) + \chi_1 PO + \chi_2 IBO + \chi_3 RAO_{ij} + \chi_4 ABS_{ij} + \chi_5 BC_{ij} + \chi_6 EBTI_{ij} + \chi_7 Year2002 + \chi_8 Year2003 + \varepsilon_{ij}$$

where:

*PO* is the Indicator for Public Ownership

*IBO* is the Indicator for Involvement in Business Operation

*RAO* is the Indicator for Regulatory and Administrative Opacity

*ABS* is the Indicator for Administrative Burdens on Start-up

*BC* is the Indicator for Barriers to Competition

*EBTI* is the Indicator for Explicit Barriers to Trade and Investment

$Year_{2002}$  is the Dummy Variable for the year 2002

$Year_{2003}$  is the Dummy Variable for the year 2003

$\varepsilon_{ij}$  is a Residual Variable

The residual variable represents influences on bilateral service trade by other than the described variables. The  $\chi_l$  ( $l = 1, \dots, 9$ ) are the coefficients of the average regulatory indicators. These, the constant term  $\ln(G)$ , and the coefficients  $\alpha, \beta, \delta$  will be estimated in the next section.

The data for bilateral service trade comes from the OECD and stretches from 2001 to 2003. Belgium and Luxembourg represent a special case, because there isn't much separate data for them. In these countries, the data is merged and appears as data for Belgium-Luxembourg. Data for bilateral import and export of services exists for all countries, but it can vary because of the use of different data sources. Some data is missing because not all 15 EU Member States report bilateral service trade for all years. There is missing data for Belgium-Luxembourg, Greece, Ireland, Netherlands, Spain and Sweden.

Data about the GDP comes from the World Economic Outlook Database kept by the International Monetary Fund, and the distance data are a result of investigations by CEPII (Mayer and Zignago 2006). The regulatory indicators are based on the results of the questionnaire by the OECD, as mentioned before.

## 4 Estimation of the Model

Before the coefficients of the linear service trade model are calculated, we can make some predictions. The signs of the coefficients of the logarithm of the GDP variables and the logarithm of the distance should be positive, whereas the coefficient of the distance variable should be negative, in accordance to the definition of economic gravity equations. The regression uses only the data and no defined equation, and because of this, the coefficient of the distance variable should be negative. This would prove the negative connection between the logarithm of the distance and the logarithm of bilateral service trade, defined in the linear service trade model. Furthermore, due to application of the monopolistic competition theory, the connection between the average regulatory indicators per sub-domain and bilateral service trade should be negative.

We will present, in what follows, the calculation of the coefficient for each variable. Beside the calculation of the coefficients, values for a significance test are also calculated. The null hypothesis of this significance test is that the true coefficient is not significantly different from zero, which means that if the calculated significance value is lower than 5%, then the true coefficient is significantly different from zero. The estimation is a linear regression performed with the original least square method.

To picture the evaluation of the internal market for services, this investigation contains the period from 2001 to 2003 and the period from 1999 to 2001. Table 5 shows the results of this regression.

From Table 5, we see that for the logged variables, both estimations show the predicted signs. The coefficients of the logarithmic variables of GDP have positive signs and lie around 0.75. The coefficients of the logarithm of distance show the predicted negative sign and are close to -1.15. In addition, all these coefficients are significant, which means that the true coefficients are significantly different from zero, and because of this, the likelihood that the estimated coefficients are close to the true coefficients is high. The coefficients of the regulatory indicators have different signs, opposite to the previous estimations from other authors (Breuss and Badinger 2005; Kox, Lejour and Montizaan 2005). From there, it is assumed that all regulatory indicators hamper service trade and, due to this, have negative coefficients. Public ownership, involvement in business operation and explicit barriers to trade and investment have positive parameters for both estimations, and regulatory and administrative opacity, administrative barriers on start-up and barriers to competition have negative signs at both periods. Some of the coefficients are significant, and these, which are not significant, are close to zero. Not significant means only that the true parameter is not significantly different from zero and then an estimated low parameter could be close to the true coefficient.

We can then evaluate the market by estimating the periods between 1999-2001 and 2001-2003. We find that the parameter of the logged variables declined during these two time periods. This means that the variables' effect on bilateral service trade sunk. The coefficients of public ownership, involvement in business operation and regulatory and administrative opacity increased, whereby the parameter of administrative burdens on start-up, barriers to competition and explicit barriers to

trade and investment decreased. Three of the six raised parameters mean that the negative impact of national regulations becomes lower, and the two variables of these three with positive parameters are counterproductive and support service trade. The increase in parameter values shows that the effect of the directive on service sinks. When we look at the two positive coefficients, we find the effect of the directive becomes negative, and through its application, service trade would decline.

\*\*\*\* TABLE 5 \*\*\*\*

Using the linear service trade model with the parameters for the period of 2001 to 2003, and calculating bilateral service trade, reveals the most up to date effect of the directive on services. Calculating service trade with the original data gives the actual service trade, and other influences than the ones explicitly used are left out. Using the new values of the average regulatory indicators with the applied directive, and no other modified data, results in comparable values for bilateral service trade. Only data for 2003 is used to have a complete year, which serves as basis for estimating the effect of the directive on services.

Table 6 summarizes these estimated effects. Overall, service trade would decrease as a result of the implementation of the directive on service. The trade volume would decline by values between -2.2% to -7.9% or around -8.08 Million USD to -28.87 Million USD (the calculated total service trade of the 15 Member States was 363.16 Million USD). The reasons behind this surprising result are the

decreasing effects of public ownership, involvement in business operation and explicit barriers to trade and investment. Regulatory and administrative barriers and administrative barriers on start-up cannot match this effect. The barriers to competition are not affected by the directive and have no effect on bilateral service trade. The calculated service trade of the Member States in 2003 was 364.58 Million USD.

\*\*\*\* TABLE 6 \*\*\*\*

If we take into consideration the period between 1999 to 2001 and the year 2001 as basis for analysing the changes due to the directive, we can see that the effect is a positive one (Table 6). This indicates a development of the market for service to become more open. It seems that old regulations could be modified without governmental intervention.

Figure 3 shows the calculated bilateral service trade of the Member States from 2001 to 2003. For 2003, the figure compares the calculated value for service trade without the directive with the estimated values for service trade, which contains the minimum and the maximum effects of the implemented directive.

The trade volume of services would be smaller, as a result of the applied directive. The calculated trade volume without the directive accounts for 363.16 Million USD, and the values for the minimum and the maximum effect account for

355.07 Million USD (minimum effect) and 334.28 Million USD (maximum effect).

\*\*\*\* FIGURE 3 \*\*\*\*

In short, this part shows the opposite effect of the assumed, theoretical, effect of the directive on service trade. In theory, a reduction of barriers to entry of service providers leads to more competition, which could encourage higher trade. This investigation shows that the application of the directive on services, which reduces regulatory barriers, decreases service trade between the regarded Member States.

## **5 Discussion and Conclusions**

The internal service sector of the EU is crucial for the European economy. Services make up around 70% of total GDP and employment in the Member States, as well as of the EU itself. Service trade alone is important, as it accounts for 20% of the trade on the internal European market. As a report made by the European Commission shows, the national regulations by the Member States hamper service trade. To make these regulations more flexible, the European Parliament issued a directive on service, with the desired effect of an increase in the service trade.

Other studies by Breuss and Badinger (2005), Copenhagen Economics (2005) and Kox, Lejour and Montizaan (2005), estimated an increasing effect for service trade, growth or employment, but these studies used pre-2002 data (Breuss and

Badinger) for the period of 1999 to 2001 (Kox, Lejour and Montizaan). This study investigates the economic effects of the final directive on services from 2006, particularly the effect on service trade on the internal European market on services. To test its assumptions, the present research develops a linear service trade model based on the monopolistic competition theory and economic gravity equations. We introduce regulatory indicators to calculate the level of regulations of the Member States and we use those indicators to estimate the effect of the directive on service trade. Using data from 15 Member States for the period of 2001 to 2003 shows that the application of the directive would cause a negative economic effect on service trade in the short run. By application of the directive, internal service trade would decrease by a value between 2.2% to 7.9%.

The other studies, together with the present study's estimations for the period of 1999 to 2001 and 2001 to 2003, show that the estimated positive effect on service trade of the Member States, due to the implementation of the directive is not as expected, and that the effect might indeed be a negative one. The application of the directive could hamper the development of the market for services, because it would open the market.

The development of the directive on services is crucial and may influence the results of all mentioned studies. Furthermore, data from new Member States could change the estimated effects. These states can provide simpler services, with low wages and lower prices compared to the old Member States. By opening the national service markets, foreign providers could replace domestic providers for these specific services. This is why critics of the directive fear that its implementation could cause



social dumping and raise unemployment.

This study treats services as homogenous, but in reality, services differ by their type. The implementation of the directive could raise competition in simple services more than in complex services, which need more knowledge, education or infrastructure. We advise that the development of the national service markets and the implementation of the directive on services be explored further. In addition, the economic effect of the directive itself in the long run is unclear and needs further analyses.

## **Appendix: Methodology for Regulatory Indicators**

The indicators are bilateral, which means that they consider only two countries at the same time. The idea behind this is that service providers want to offer their services in other Member States and have to comply to different national regulations - those of their country of origin and those of the destination country.

The development of these bilateral regulatory indicators used the results of a questionnaire by the OECD (2003). In that questionnaire, OECD asked countries about their regulatory structures and policies. The methodology uses only Yes-or-No-Questions. These questions have no dimension, and to evaluate them numerically is impossible. Comparing the answers of two countries leads to a binary structure. Two countries can have identical or non-identical answers at one compared item.

Let  $n$  be the different countries, and an item or question  $k$  ( $k \in N$ ) where two

countries differ or not. The bilateral regulatory indicator  $BRI_{ij}^k$  gets the value 0 at item  $k$  if the answers of the countries  $i$  and  $j$  are similar, or the value 1 if they are dissimilar. The indicator reads as follows:

$$(5) \quad BRI_{ij}^k = \{0,1\}, \forall i, j \in (1, \dots, n).$$

All binary information for one item can be summarized in a bilateral regulatory matrix  $BRM^k$ . For the case of four countries,  $(a, b, c, d)$  this matrix looks like:

$$(6) \quad BRM^k = \begin{bmatrix} 0 & BRI_{ab}^k & BRI_{ac}^k & BRI_{ad}^k \\ 0 & 0 & BRI_{bc}^k & BRI_{bd}^k \\ 0 & 0 & 0 & BRI_{cd}^k \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

A comparison of a country with itself does not make sense, and only a one-way comparison is necessary. The chronological order of the compared countries does not matter for the assigned value. If there is high dissimilarity between the countries, then the matrix has many entries with the value one.

The database of the OECD contains more than one question, which induces the development of a more complex bilateral regulatory matrix. Note that the countries differ in  $m$  ( $m \in \{k1, k2, k3, \dots, K\}, (k1, k2, k3, \dots, K \in N)$ ) items. This leads to the following bilateral regulatory matrix:

$$(7) \quad BRM^m = \begin{bmatrix} 0 & BRI_{ab}^{k1} & BRI_{ac}^{k1} & BRI_{ad}^{k1} & \dots & 0 & BRI_{ab}^K & BRI_{ac}^K & BRI_{ad}^K \\ 0 & 0 & BRI_{bc}^{k1} & BRI_{bd}^{k1} & \dots & 0 & 0 & BRI_{bc}^K & BRI_{bd}^K \\ 0 & 0 & 0 & BRI_{cd}^{k1} & \dots & 0 & 0 & 0 & BRI_{cd}^K \\ 0 & 0 & 0 & 0 & \dots & 0 & 0 & 0 & 0 \end{bmatrix}$$

Furthermore, the countries may have  $s$

( $s \in \{s1, s2, s3, \dots, S\}, (s1, s2, s4, \dots, S \in N)$ ) different qualitative ways of dealing with a particular item  $m$ . The number of  $s$  may differ from one item to another, but it cannot be higher than the total number of compared countries. At a maximum, each country can have a different  $s$  than the other countries.  $S$  is the maximum number of ways in which  $m$  items can differ. This enlarges the bilateral regulatory matrix to  $BRM^{ms}$ :

(8)

$$BRM^{ms} = \begin{bmatrix} 0 & BRI_{ab}^{k1,s1} & BRI_{ac}^{k1,s1} & BRI_{ad}^{k1,s1} & \dots & 0 & BRI_{ab}^{K,s1} & BRI_{cb}^{K,s1} & BRI_{ad}^{K,s1} \\ 0 & 0 & BRI_{bc}^{k1,s1} & BRI_{bd}^{k1,s1} & \dots & 0 & 0 & BRI_{bc}^{K,s1} & BRI_{bd}^{K,s1} \\ 0 & 0 & 0 & BRI_{cd}^{k1,s1} & \dots & 0 & 0 & 0 & BRI_{cd}^{K,s1} \\ 0 & 0 & 0 & 0 & \dots & 0 & 0 & 0 & 0 \\ \dots & \dots & \dots & \dots & \dots & \dots & \dots & \dots & \dots \\ 0 & BRI_{ab}^{k1,S} & BRI_{ac}^{k1,S} & BRI_{ad}^{k1,S} & \dots & 0 & BRI_{ab}^{K,S} & BRI_{ac}^{K,S} & BRI_{ad}^{K,S} \\ 0 & 0 & BRI_{bc}^{k1,S} & BRI_{bd}^{k1,S} & \dots & 0 & 0 & BRI_{bc}^{K,S} & BRI_{bd}^{K,S} \\ 0 & 0 & 0 & BRI_{cd}^{k1,S} & \dots & 0 & 0 & 0 & BRI_{cd}^{K,S} \\ 0 & 0 & 0 & 0 & \dots & 0 & 0 & 0 & 0 \end{bmatrix}$$

Not all items may differ by the number of ways and there are many items with a binary nature. Thereby, the matrix  $BRM^{ms}$  contains several sub-matrices with zero values. Summarizing the values of each item for a country pair leads to the bilateral regulatory indicators per country pair ( $RICP_{ij}$ ).

$$(9) \quad RICP_{ij} = \sum_s \sum_m BRI_{ij}^{m,s}$$

These indicators divided through the count of items leads to the average regulatory indicators per country pair (*ARICP*).

$$ARICP_{ij} = \frac{1}{K} \sum_s \sum_m BRI_{ij}^{m,s}$$

These average indicators are useful for the comparison of national regulations between different countries.

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## Tables

TABLE 1

### SHARE OF SERVICES ON GDP AND EMPLOYMENT OF 2003

<b>Country</b>	<b>Services in % in share of total GDP</b>	<b>Services in % in share of total Employment</b>
Austria	60.4	63.2
Belgium	68.6	76.0
Finland	58.5	68.7
France	67.9	73.9
Germany	65.3	70.4
Greece	64.5	60.9
Ireland	50.0	65.8
Italy	66.4	66.5
Luxembourg	92.7	77.2
Netherlands	67.5	77.7
Portugal	63.0	59.7
Spain	63.9	65.3
Euro area	65.6	68.3
United Kingdom	68.6	80.6
United States	71.5	81.1

Source: Vogt (2005, p. 5)

TABLE 2

## COLLECTED ITEMS IN THE OECD REGULATION DATABASE

<b>Domain</b>	<b>Sub-Domain</b>	<b>Number of Items in the Database</b>	<b>Weight of total Number of Items</b>
State Control	Public Ownership	28	22.58%
	Involvement in Business Operation	20	16.13%
	Regulatory and Administrative Opacity	48	38.71%
Barriers to Entrepreneurship	Administrative Burdens on Start-up	11	8.87%
	Barriers to Competition	22	17.74%
	Explicit Barriers to Trade and Investment	26	20.97%
Barriers to Trade and Investment	Other Barriers	59	47.58%
		13	10.48%
		4	3.23%
		17	13.71%
<b>Total</b>		<b>124</b>	<b>100%</b>

Source: CONWAY, JANOD and NICOLETTI (2005)

TABLE 3

## CONSTRUCTION OF THE AVERAGE REGULATORY INDICATORS

Comparison Item	Answer of Country		Assigned Value	Count	Value of ARICP
	i	j			
Are the prices of domestic airfares regulated in any way?	Yes	No	1	1	1
The level of government at which shopping hours regulations are set is :	National and State/provincial		0.33	2	0.665
i) National	National				
ii) State/ provincial					
iii) Local					
How many different public and private bodies would an entrepreneur need to contact to register a public limited company (pre-registration + registration)?	25	10	0.4	3	0,5766

Source: CONWAY, JANOD and NICOLETTI (2005)

TABLE 4

## EFFECT OF THE DIRECTIVE ON SERVICES ON REGULATORY BARRIERS

<b>Sub-Domain</b>	<b>Reduction of Regulatory Barriers through the Application of the Service Directive</b>
Public Ownership	11%
Involvement in Business Operation	0% - 23%
Regulatory and Administrative Opacity	79% - 91%
Administrative Burdens on Start-up	0% - 15%
Barriers to Competition	0%
Explicit Barriers to Trade and Investment	17%
<b>Total Reduction</b>	<b>11% - 19%</b>

Source: own calculations

TABLE 5

## RESULT OF THE LINEAR SERVICE TRADE MODEL REGRESSION

Coefficient {of the Variable}	Period 1999 to 2001	Period 2001 to 2003
$\ln(G)$	<b>-6.49</b> (0.00) <sup>a)</sup>	<b>-4.38</b> (0.00)
$\alpha \{ \ln(GDP_i) \}$	<b>0.81</b> (0.00)	<b>0.72</b> (0.00)
$\beta \{ \ln(GDP_j) \}$	<b>0.78</b> (0.00)	<b>0.74</b> (0.00)
$\delta \{ \ln(D_{ij}) \}$	<b>-1.05</b> (0.00)	<b>-1.14</b> (0.00)
$\chi_1 \{ PO \}$	<b>0.37</b> (0.20)	<b>0.49</b> (0.14)
$\chi_2 \{ IBO \}$	<b>0.72</b> (0.02)	<b>1.00</b> (0.00)
$\chi_3 \{ RAO_{ij} \}$	<b>-0.92</b> (0.00)	<b>-0.09</b> (0.69)
$\chi_4 \{ ABS_{ij} \}$	<b>-0.03</b> (0.91)	<b>-0.25</b> (0.37)
$\chi_5 \{ BC_{ij} \}$	<b>-0.21</b> (0.44)	<b>-0.26</b> (0.49)
$\chi_6 \{ EBTI_{ij} \}$	<b>0.69</b> (0.01)	<b>0.62</b> (0.06)
$\chi_7 \{ Year2002 \}$	<b>0.08</b> (0.26)	<b>-0.07</b> (0.36)

$\chi_8 \{ Year2003 \}$	<b>0.06</b> (0.38)	<b>-0.04(0.57)</b>
R <sup>2</sup>	0.86	0.84
a) estimated Coefficient (value of the significance test)	The significance level is 5% and each variable contains 469 values.	

Source: own calculation

TABLE 6

EFFECTS OF THE DIRECTIVE ON SERVICES ON THE BILATERAL SERVICE TRADE, CHANGES BASED ON 2003

Domain/ Sub-Domain	Effect on Bilateral Service Trade	
	Minimum Effect	Maximum Effect
Due to Public Ownership	-1.6%	
Due to Involvement in Business Operation	0%	-7.5%
Due to Regulatory and Administrative Opacity	+2%	+2.3%
Due to Administrative Burdens on Start-up	0%	+1.4%
Due to Barriers to Competition	No Effect	
Due to Explicit Barriers to Trade and Investment	-2.5%	
Total Effect (2003)	-2.2%	-7.9%

Total Effect based on the older period 1999 to 2001, changes base on 2001	+19.9%	+21.5%
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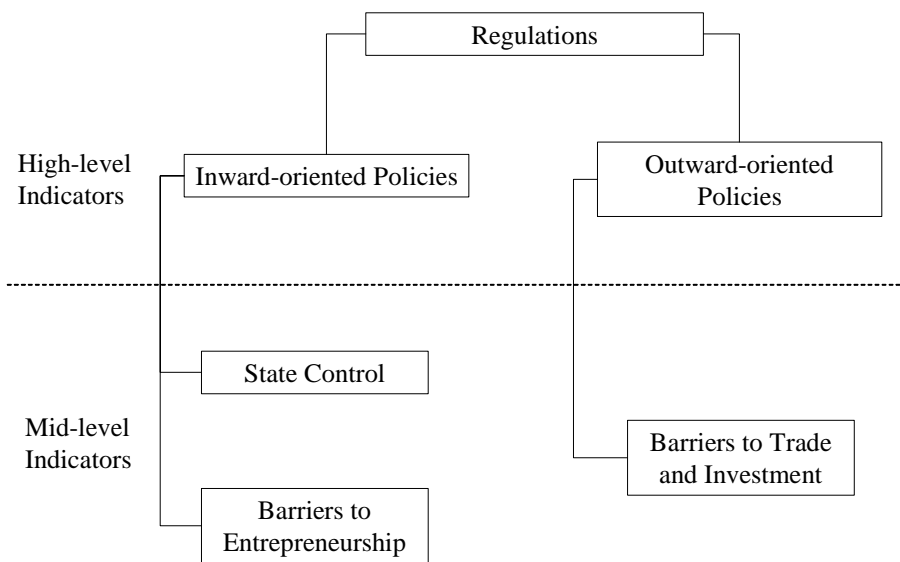
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Source: own calculation

## Figures

FIGURE 1

### HIGH- AND MID-LEVEL INDICATORS OF REGULATIONS

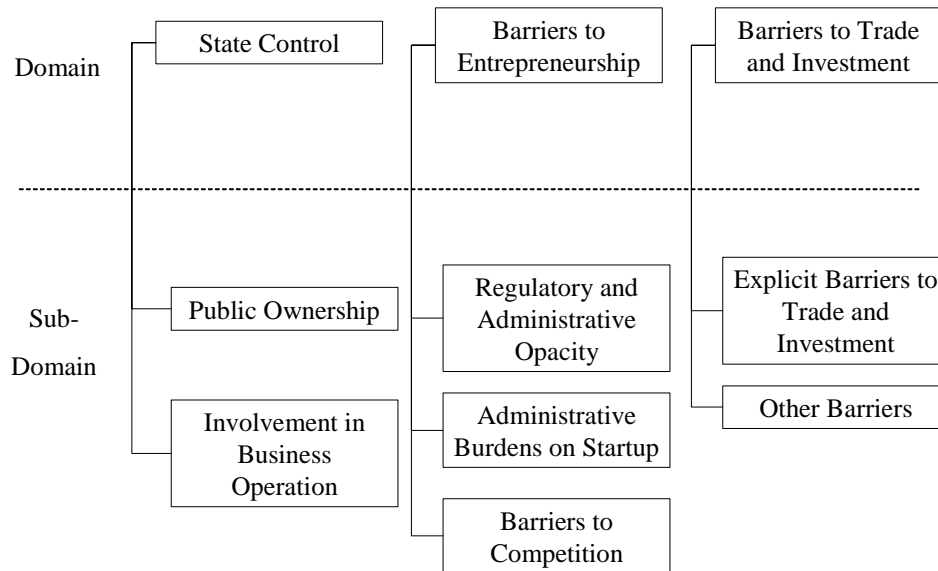


Source: Conway, Janod and Nicoletti (2005)



FIGURE 2

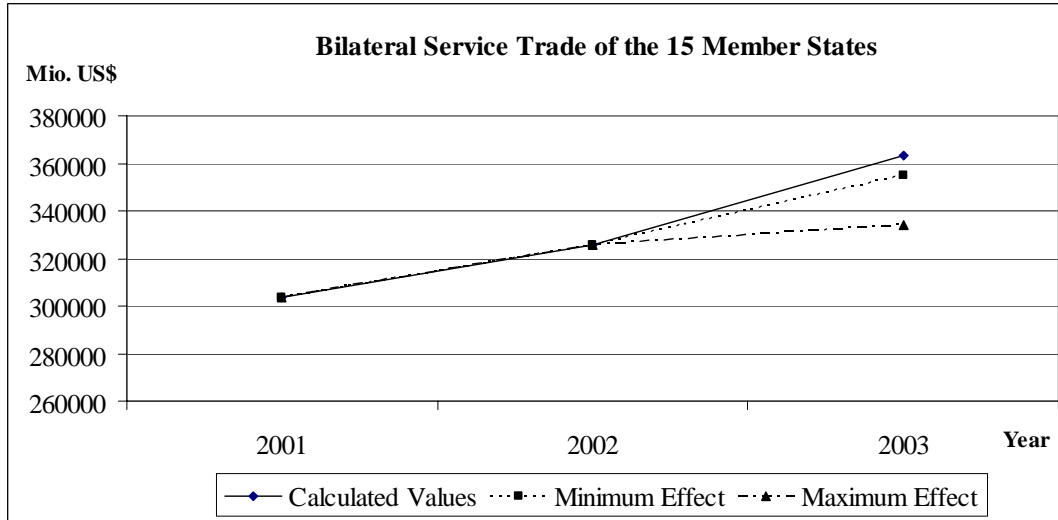
## MID\_LEVEL INDICATORS DIVIDED IN DOMAINS AND SUB\_DOMAINS



Source: Conway, P., Janod, V. and Nicoletti, G. (2005)

FIGURE 3

## BILATERAL SERVICE TRADE WITH APPLIED DIRECTIVE ON SERVICES



Source: own calculation according to Conway, Janod and Nicoletti (2005)