Trade and Regulation: Computer Services and other Business Services

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EXECUTIVE SUMMARY

This paper provides a sector study of computer and information services and business services other than professional services under the OECD/TAD Services Trade Restrictiveness Index (STRI) project. These services have in common that they are subject to relatively few explicit barriers to trade and investment. The business services covered by this study are information-intensive and their value added relates to the processing of information, some of which can be easily codified and transmitted across electronic networks. Business services are therefore among the most tradable among services.

The determinants of trade in business services are analysed both qualitatively and quantitatively. An attempt it s made to assess to what extent modes of supply are complementary, substitutes or independent. This provides a useful background for developing the STRI for both business services and other services:

- Observed openness in a relatively unrestricted and tradable sector such as computer services can serve as a benchmark for the estimation of the overall trade restrictiveness index for a country;
- Business services are first and foremost inputs in the production and distribution of other products, both goods and services. It is important to assess to what extent international demand and supply of business services is driven by sector-specific forces or whether they are derived from the dynamics of other sectors. The answer to this question has a bearing the trade response to trade liberalisation and regulatory reform;
- If modes of supply are related, restrictions in one mode will affect trade in other modes as well. E.g. restrictions on business travel may restrict cross-border trade as well if occasional face to face interaction is essential for the delivery of the service;
- If modes of supply are related, it would be most appropriate to develop one trade restrictiveness index for the sector, not individual indicators by mode.

The study starts with a brief assessment of the importance of business services in the economy. Computer services are still a relatively small sector, accounting for about 2% of total GDP and employment on average in OECD countries. Other business services in contrast are a more important source of income and employment than manufacturing in many OECD countries.

The study next presents recent trends in trade in business services. Computer and information services have experienced rapid growth, but from a low base. India and Ireland are the largest exporters of these services. OECD as a whole is a net exporter of both computer services and other business services. It appears that the relative importance of commercial presence compared to cross-border trade has increased over time.

Business services mainly provide inputs to organisations rather than to individuals. The growing share of business services in GDP partly reflects outsourcing of services from manufacturing and other services production to external suppliers, but the development of new services and more specialised tasks appears to be the most important source of growth. New services support and complement tasks performed internally in the client firm, and close interaction between services supplier and client is observed in a

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broad range of business services. It is argued that the nature of client-supplier relationships suggests that modes of supply are largely complementary and that few business services can be provided cross-border alone.

It is found that a number of regulatory measures for which information is obtained through the PMR survey restrict trade in business services. Interestingly, restrictive outward oriented policies are associated with lower trade values in ongoing trade relationships while restrictive inward oriented policies in general and state control in particular are associated with a lower probability to enter the market. The individual indicators found to be significantly related to trade in business services are listed in the study.

The study concludes with suggesting a way forward for estimating a services trade restrictiveness index for business services. It is proposed that computer services may serve as a benchmark free trade sector when developing the aggregate STRI for each country. In addition to the information on restrictions derived from the PMR and the OECD investment restrictiveness index, the services trade restrictiveness index should also incorporate restrictions on public procurement and movement of natural persons. Further, it is argued that there should be one STRI for each business services sub-sector, but not for each mode of supply since modes of supply are likely to be complementary. Finally a methodology for estimating the STRI is suggested.

1. Introduction

1.   This paper provides a sector study of business services, other than professional services, under the OECD/TAD Services Trade Restrictiveness Index (STRI) project.

2.   Business services entail a broad variety of services that have in common that they are provided to organisations rather than to individuals. Furthermore, business services are often an essential and integrated part of the client organisation's production process. Due to advances in communication technology, the business services sector has become increasingly international and a growing literature has emerged that analyses the scale and scope of international trade in business services. Hitherto the focus has mainly been on the driving forces and the employment and welfare consequences.[1] There is, however, very little analysis of barriers to trade in business services.

3.   This paper contributes to filling this gap. Its objective is three-fold. First, it aims at understanding to what extent trade in business services is related to trade in other sectors. Thus, if trade in business services is demand-driven on the basis of internationalisation of other sectors, this has a bearing on which policy restrictions are binding. Second, the study aims at making a first attempt at analysing to what extent commercial presence and/or movement of natural persons are necessary for cross-border trade in business services. The answer to this question determines whether or not a separate index on each mode of supply is meaningful. Finally the paper makes a first attempt to identify the barriers to trade in business services.[2]

4.   The business services covered in this paper are computer and information services and other business services. A complementary paper under this project covers the professional services (accounting, architecture, engineering and legal services). When analysing trade restrictiveness it is natural to distinguish professional services from other business services because the professional services tend to be much more regulated and subject to more explicit and implicit barriers to trade and investment than the other business services. It is, however, not always easy to distinguish the professional services from the other business services in available trade and investment data. Particularly data on foreign direct investment (FDI) and sales by foreign affiliates are usually reported at a 2-digit industrial classification level where the professional services and other business services all belong to ISIC category 74. Some overlap in the quantitative analysis of trade can therefore not be entirely avoided, but the qualitative analysis in this paper does not apply to the professional services. Computer services are found under ISIC category 72, computer and related services.

5.   Cross border trade in services are reported under EBOPS categories 263 computer services; 264 information services (which together constitute 262 computer and information services); and 268 other business services. Data coverage is usually far better for sector 262 than for 263 and 264 separately, so in most cases the analysis will be at the 262 level. EBOPS 268 refers to other business services and includes sub-sectors 269-285 of which 275, 276 and 280 cover professional services included in the complementary paper. Whenever data allows, 268 net of these services will be presented. The most important among these are advertising, market research and opinion polling, business and management consultancy services, labour recruitment and provision of personnel, investigation and security activities and services provided between affiliated businesses and other business activities not elsewhere classified. See Box 1 for details on classification.

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[1] For a recent comprehensive analysis, see Rubalcaba and Kox (2007).

[2] As defined in the General Agreement on Trade in Services (GATS) trade in services entails four modes; cross-border trade, consumption abroad, commercial presence and movement of natural persons.

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Box 1.

Sector classification

The cross-border trade data analysed in this paper are presented according to the Extended Balance of Payments Services (EBOPS) classification while data on production, foreign direct investment and sales of foreign affiliate statistics are classified according to the International Standard Industrial Classification (ISIC rev 3.)

The EBOPS categories included are:
262 Computer and information services
      263 Computer services
      264 Information services
          889 News Agency services
          890 Other information provision services
268 Other business services
      269 Merchanting, other trade related services
      272 Operational leasing services
      273 Miscellaneous business, professional and technical services*
      278 Advertising, market research and public opinion polling
      279 Research and development
      280 Architectural engineering and other technical services*
      281 Agricultural, mining and on-site processing services
      284 Other business services
      285 Services between related enterprises n.e.c

The ISIC categories are:
72 Computer and related activities
74 Other business activities
      741 Legal, accounting, book-keeping and auditing activities; tax consultancy; market research and public opinion polling; business and management consultancy*
      742 Architecture engineering and other technical services*
      743 Advertising
      749 Business activities n.e.c.

* Contains professional services, which are excluded from the qualitative analysis.

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6.   The rest of the paper is organised as follows. Section 2 discusses the economic importance of business services. Section 3 describes trade patterns by mode of supply and partner country. Section 4 discusses driving forces, Section 5 discusses implicit and explicit barriers to trade in business services while Section 6 summarises and concludes with recommendations on which explicit and implicit barriers to trade should be included in the restrictiveness index for business services.

2. Economic importance of business services

7.   Computer services (ISIC 72) and other business services (ISIC 74) have experienced a rising share of GDP and employment over the past three decades. Table 1 presents data on growth and relative importance in the sectors in five selected OECD countries. Manufacturing is included for comparison. Computer services have experienced spectacular growth, but from a low base. In the United States the sector's real value added increased 12.3-fold, but in Japan it only doubled. Other business services in contrast have grown the fastest in Japan, increasing more than 3-fold during the quarter century from 1980

to 2005. In all the selected countries except Sweden, other business services have grown faster than manufacturing.[3]

8.   Computer services are a small sector in the five selected countries, accounting for 1-3% of total GDP and employment. Nevertheless the sector exhibits faster growth than the economy at large and its share in GDP and employment has increased. Computer services are a relatively capital-intensive sector, which is reflected in a lower share in employment than in GDP in all five countries. Other business services in contrast is relatively labour intensive, contributing more to total employment than to total GDP in all five countries. In the Netherlands other business services constitute a larger source of employment than manufacturing, while in the US computer services and other business services combined employ more people than manufacturing.

Table 1. Key indicators of the relative importance of business services in the economy, selected countries.

Volume change and sector shares of total

	USA		Japan		Germany		Netherlands		Sweden	
	1980	2005	1980	2005	1980	2005	1980	2005	1980	2005
Real growth										
Computer services		12.3		1.9		7.2		10.2		3.2
Other business services		2.5		3.1		2.2		2.9		1.9
Manufacturing		2.3		2.3		1.2		1.7		2.5
Share of total value added										
Computer services	0.3%	1.9%	1.8%	2.3%	0.4%	1.6%	0.4%	1.9%	0.7%	3.1%
Other business services	3.9%	8.0%	1.8%	4.2%	4.9%	8.9%	4.7%	9.2%	2.8%	6.6%
Manufacturing	22.7%	15.6%	28.2%	20.8%	29.7%	22.5%	18.1%	14.0%	21.7%	19.7%
Share of total employment										
Computer services	0.3%	1.5%	0.6%	2.1%	0.4%	1.3%	0.3%	1.6%	0.6%	2.2%
Other business services	4.8%	9.1%	2.7%	7.5%	3.3%	10.2%	5.7%	13.8%	2.9%	7.4%
Manufacturing	19.3%	10.3%	23.3%	17.2%	30.6%	19.3%	19.5%	11.2%	23.5%	16.5%

Source: EU KLEMS data base http://www.euklems.net/
Note: Growth is shown as the volume index in 2005 divided by the volume index in 1980.

9.   It has been hypothesised that the growing share of business services in the economy is due to outsourcing of activities that were previously conducted inside the manufacturing sector and that the rising share therefore is a statistical artefact. Recent research does, however, suggest that the rise in business services is real. Case studies and comprehensive surveys have found that the share of non-production workers has not declined in the manufacturing sector following the rise of business services.[4] This is further documented by Pilat and Wölfl (2005) for the OECD countries. Although there was a small decline in the share of services-related jobs in manufacturing in Portugal and France and a somewhat larger decline in Denmark between 1995 and 2002, most countries exhibit an increase.

10.   The role of business services in the economy is mainly as providers of inputs into the design, production and distribution of goods and services, including the management of supply chains and international production networks.[5] In Germany, for instance, about 95% of gross output in the business

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[3] Sweden has specialised in ICT hardware rather than services and its production of radio, television and communication equipment has increased 57-fold since 1995 according to the EU KLEMS database.

[4] See Bryson *et al*. (2004) and Miles (2007) for reviews of the literature.

[5] See Lesher and Nordås (2007) for an analysis of linkages between business services and other sectors.

services sectors went to either intermediate use or gross fixed capital formation in the year 2000.[6] The economic benefits from trade in business services therefore not only stem from the well-known efficiency gains from specialisation according to comparative advantage and lower consumer prices, but also from access to better, cheaper and a broader variety of intermediate inputs, some of which may be essential for the competitiveness of the downstream industry (Markusen, 1989; Robert-Nicoud, 2008).

11.   Recent research has found that business services complement and support services produced inside the client firm (Bryson et al, 2004). Thus, external and internal services are interwoven at all stages of manufacturing production from design, R&D, market research and testing at the pre-production stage; via process design, quality control, procurement, maintenance and many more during production; to marketing packaging, and after sales services after production. Demand for external business services stems from the need to increase flexibility, reduce risk and solve problems related to the development or adopting of technology, entering into new markets, comply with new regulation or existing regulation in new markets to mention the most important. Most organisations do not have in-house capacity, nor would it be economical or practical to acquire the capacity to solve problems of the nature described here. Demand for business services is therefore likely to follow the business cycle and import demand for business services is likely to follow internationalisation of other sectors. We note that government regulation can actually be a source of demand for business services.

12.   Eurostat provides information on numbers of firms and other key variables for services for some countries, and from this information it appears that the markets for both computer services (ISIC 72) and other business services (ISIC 7413, 7414, 743, 744 and 745) are relatively competitive with a large number of firms.[7] In addition some studies suggest that business services firms tend to be either relatively large or small with a thin middle range. The observation is explained by two important sources of competitiveness for business services firms. One is to provide the clients with strategic inputs that help them adjust to new challenges. This often requires a team of consultants with different skills and oversight that only large business services firms can provide. The other source of competitiveness is niche state-of-the art competency and flexibility where small, even micro firms have an advantage (Bryson *et al.* 2004).

## 3. Trade patterns

3.1 Cross-border trade

13.   We start by presenting data on recent trends in cross-border trade in business services. Figure 1 shows developments over the past decade for business services for total OECD. Although a very dynamic sector, computer and information services account for a small share of total services trade, standing at 2.6% of OECD services imports and 3.9% of services exports in 2005. The OECD average conceals large variations between countries, however. In Ireland, computer services is the most important traded services sector, accounting for a third of total services exports in 2002. Other business services accounted for about 22% of OECD exports and imports in 2005.[8]

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[6] The share is calculated from the input-output table in the OECD input-output database. Business services in this calculation includes ISIC sector 72, computer and related services; 73, research and development; and 74, other business services.

[7] The countries for which data on number of companies in NACE code 72 is available are Denmark, 7488 companies; Spain, 28881; Portugal, 5891; Romania, 10771; Slovenia, 2254; Sweden, 30356 and Norway 9348. All numbers are from 2005, the latest available years (Source: Eurostat). A measure of market concentration (e.g. the market share of the five largest firms) would be a better indicator of the competitiveness of the market, but we do not have sufficient information to calculate such indices.

[8] Travel and transport account for slightly less than half of world trade in services.

Figure 1. Cross-border trade in business services, OECD total, USD mill.
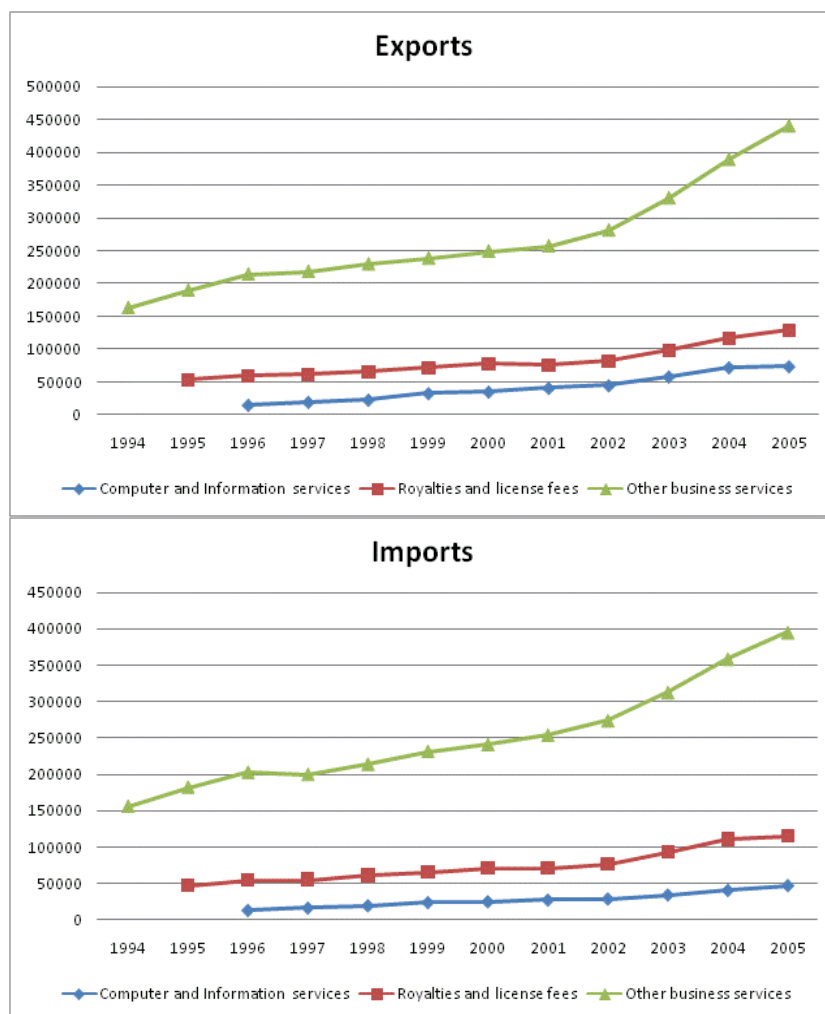
Source: OECD

14.   Computer and information services (EBOPS 262) are among the services sectors exhibiting the fastest trade growth among all services sectors. For the OECD area as a whole imports increased 3.6-fold from 1996 to 2005, while exports increased 5.2-fold (in current US dollar terms). This is a relatively skills intensive sector and one would expect OECD countries to have a comparative advantage for computer and information services. This is also borne out in the data, showing an exports/imports ratio increasing from 1.11 in 1995 to 1.80 in 2004, but falling back to 1.58 in 2005.

15.   Other business services (EBOPS 268) account for a much larger share of total services trade. The exports/imports ratio has fluctuated somewhat, with a trend increase, and stood at 1.11 in 2005 as compared to 1.04 in 1995. It is also of interest to assess the importance of international trade to the business services sectors, i.e. how important is imports relative to total domestic demand, and how much of total output is exported? Table 2 provides information on this for a number of OECD and some non-OECD countries for the year 2000. The measures of openness are calculated from the OECD input-output database.

**Table 2. Measures of openness 2000, selected countries**

Export share of industry output and import penetration %

	Exports/industry output		Import penetration	
	Computer and related services	**Other business services**	**Computer and related services**	**Other business services**
AUT	5.0	16.9	6.1	14.0
BEL	24.1	19.8	25.6	15.6
BRA	6.8	16.7	23.0	12.9
CAN	21.5	10.3	6.6	13.1
CZE	8.6	18.1	8.7	30.0
DEU	11.9	5.1	12.2	5.4
DNK	22.7	8.6	22.0	7.0
ESP	29.8	13.5	24.0	20.1
FIN	10.4	8.9	11.1	26.3
FRA	2.4	8.3	3.1	7.8
GBR	8.5	14.3	4.6	10.5
HUN	10.5	17.0	13.0	30.9
IDN	5.2	2.7	37.0	41.3
IRL	70.2	42.0	15.7	78.1
ITA	4.6	5.5	5.6	6.5
JPN	1.2	1.3	2.7	2.5
NLD	15.2	15.0	15.1	16.8
NOR	16.0	18.9	6.3	22.3
POL	6.9	3.4	18.6	6.9
RUS	n.a.	13.4	n.a.	20.5
SGP	35.6	28.5	34.4	51.5
SVK	16.3	16.9	20.5	26.8
SWE	11.2	16.5	10.7	23.6
USA	3.3	2.9	0.4	0.5

Source: calculated from the OECD input-output database. Export share is export value divided by total industry output. Import penetration is import value divided by total domestic expenditure (intermediate+final, including imports).

16.   The well-known pattern of higher exposure to international trade in small countries that is observed for merchandise trade is observed for business services as well. Thus, Ireland and Singapore are the most exposed to international trade, while Japan and USA are the least exposed. We also notice that a high export share corresponds to high import penetration in most cases, suggesting that trade in business services is largely intra-industry trade. We now turn to a description of which countries are the most important trading nations in each business services category, giving a snapshot of the latest year available, 2005/2006, starting with computer services. The OECD aggregate cross-border trade flows are depicted in Figure 1 above, while Figure 2 ranks the OECD countries and major emerging countries according to their exports and imports in 2005/2006.

Figure 2. Trade in computer services, 2005/2006, USD mill.
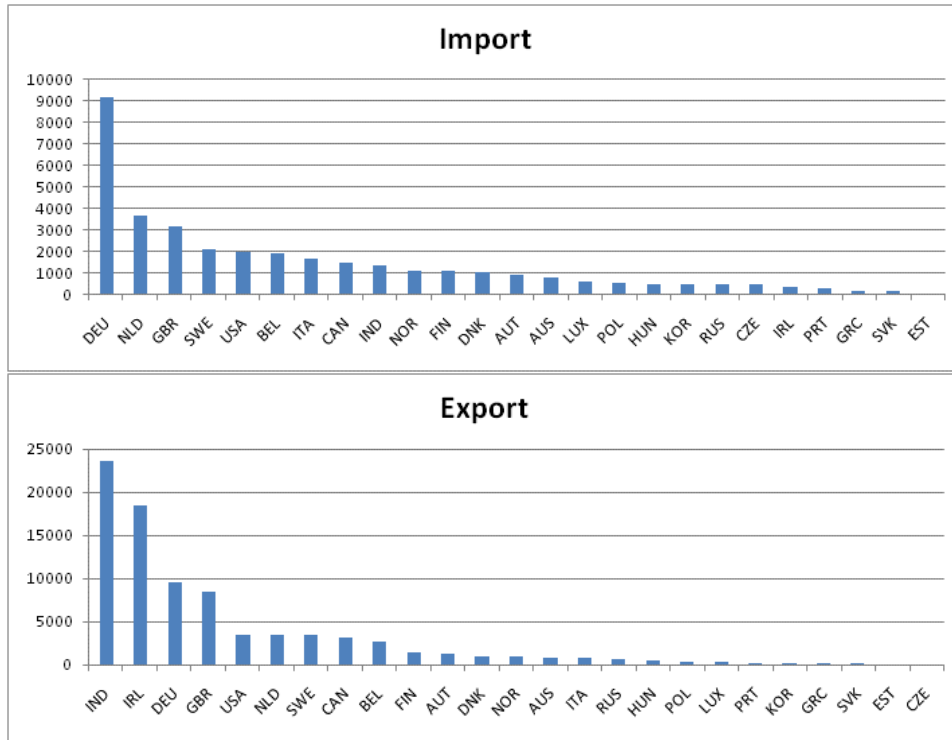
Source: OECD

17.　　On the exporting side, we see that two countries dominate; India and Ireland. The fact that a small country like Ireland has gained such a prominent position in this market underscores that trade in computer services is still small compared to total world trade and income. Germany is by far the most important market for computer services exports, as also indicated in Table 2 where Germany features a relatively high import penetration rate in spite of being a large economy. Turning to other business services (EBOPS 268), exports and imports by country are presented in Figure 3 for the year 2005/06.

Figure 3. Trade in Other business services, USD mill., 2005/06.
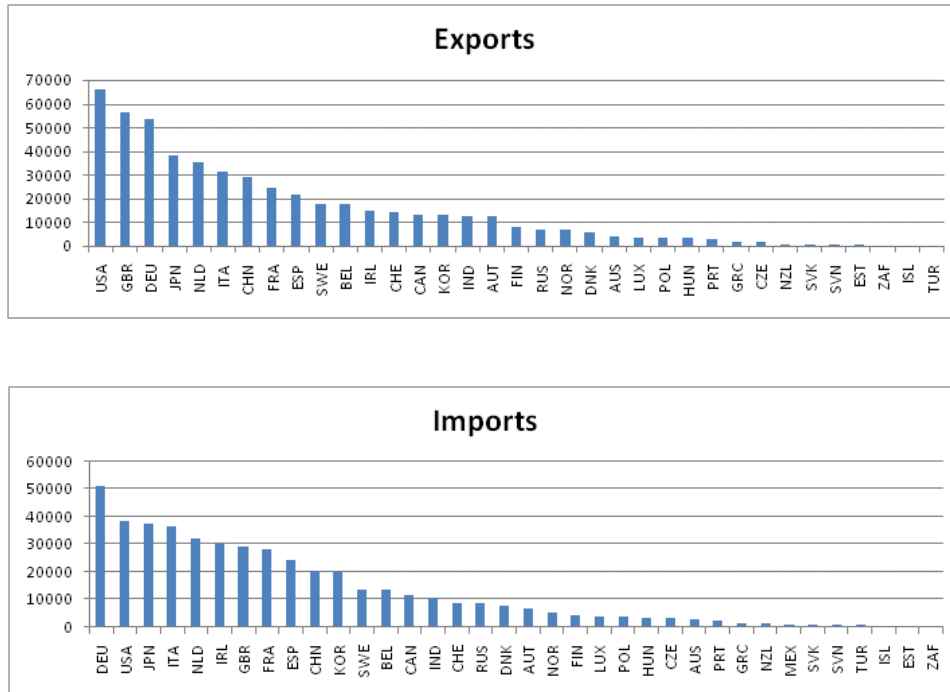
Exports

Imports

18.   In this sector the largest economies are the largest traders in absolute terms, but we notice that India is a significant trader both on the exporting and importing side also for other business services.

3.2 Who trades with whom?

19.   Who trades with whom is an important question for understanding the driving forces behind and the barriers to trade in business services. Figure 4 shows the five largest sources of imports or export destinations in leading computer services traders. It is clear that imports are quite concentrated as the five largest sources of imports account for between 68 and 80% of total imports. Exports are somewhat more diversified as illustrated by Germany's exports of computer services. Ireland's exports of such services are even more dispersed with the five largest export destinations accounting for only 13% of total computer services exports in 2004.   Ireland has established itself as a regional centre for business services particularly for US multinationals' European operations and most of its exports of business services are to other EU members.

Figure 4. Sources of imports and export destination, selected countries.

**Computer services imports in Germany, USD millions**

USA 2112 23%; IRL 1816 20%; GBR 1003 11%; CHE 817 9%; FRA 452 5%; Other 2957 32%

Legend: USA, IRL, GBR, CHE, FRA, Other

Computer services exports from Germany, USD millions

USA 1961 21%; GBR 843 9%; CHE 687 7%; ESP 601 6%; IRL 595 6%; Other 4919 51%

Legend: USA, GBR, CHE, ESP, IRL, Other

Computer and information services imports 2002 in the Netherlands, USD millions

USA 536 34%; GBR 387 25%; FRA 174 11%; DEU 98 6%; BEL 66 4%; Other 321 20%

Legend: USA, GBR, FRA, DEU, BEL, Other

Computer and information services imports 2005 in the United Kingdom, USD millions

USA 1020 26%; DEU 913 24%; IRL 493 13%; FRA 307 8%; IND 275 7%; Other 829 22%

Legend: USA, DEU, IRL, FRA, IND, Other

Source: OECD

3.3 Commercial presence (GATS mode 3)

20.   Data on sales by foreign affiliates or FATS data are scarcer than cross-border trade data. The countries for which a relative long time series is available are France, Germany and the US. Figure 5 depicts developments in outward and inward sales of foreign affiliates for the period 1995 to 2005 for computer services (ISIC category 72). It is first noticed that outward sales are between two and five times larger than inward sales for the US, while France and Germany are net importers of computer services through commercial presence, France for the entire period and Germany for most of the period, with a spell of net exports during the period 1999-2001.

Figure 5. Sales of foreign affiliates, outward and inward, Computer services

Selected countries, 1995-2005,USD mill.
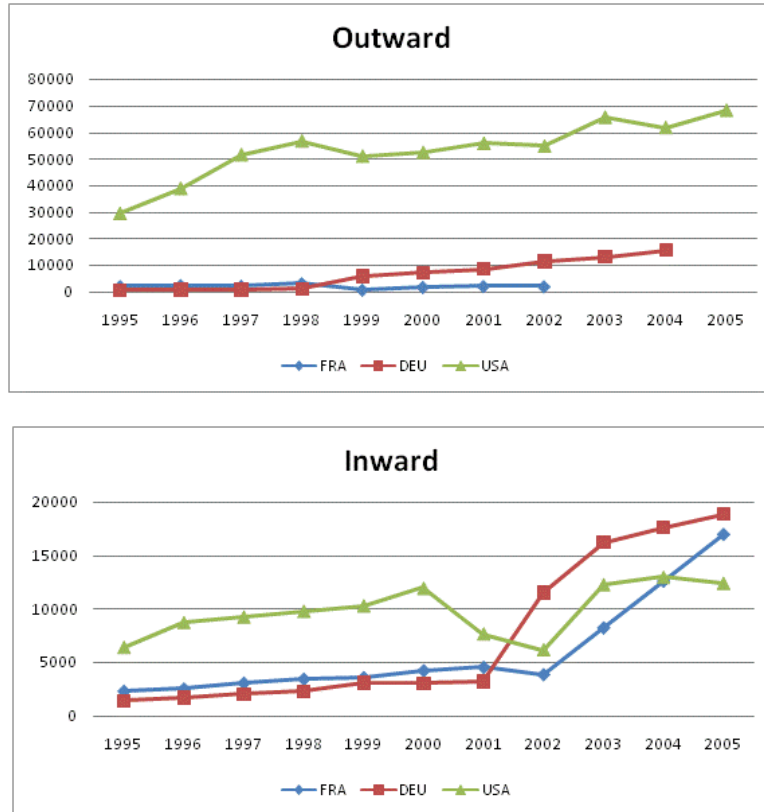
Source: OECD

21.   The dip in inward FATS for the US in 2001-2002 is probably due to the 2001 recession in which computer services were particularly hard hit. The post-recession period has, however, seen a sharp rise in inward FATS in computer services in all three countries. This rise has been much faster than cross-border imports, and the relative importance of commercial presence has increased in all three countries both for exports and imports, although the ratio of sales of foreign affiliates to cross border trade differs widely among the three countries as shown in Figure 6. The shift towards commercial presence is particularly sharp in Germany.

Figure 6. The relative importance of mode 3 and mode 1, computer services

Selected countries 1995-2005

Source: OECD

22.   Cross-border trade plays a much smaller role in the US than in Germany and France. What determines this large difference in the relative importance of mode of supply is an interesting question. Can differences be explained by differences in trade restrictiveness, or are differences in geography, market size or complementary trade and investment in goods-producing sectors the reason? These questions will be sought answered through conceptual work during the STRI project. Some preliminary results will nevertheless be presented in section 5 below. A similar pattern emerges for other business services as shown in Figures 7 and 8.

Figure 7. Outward and inward FATS, Other business services,.

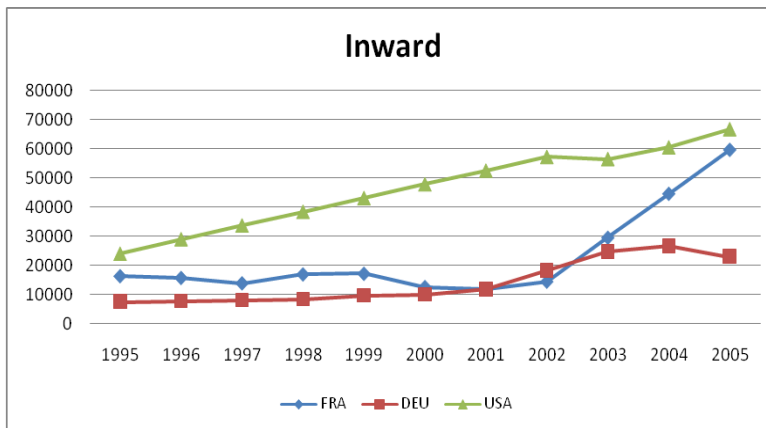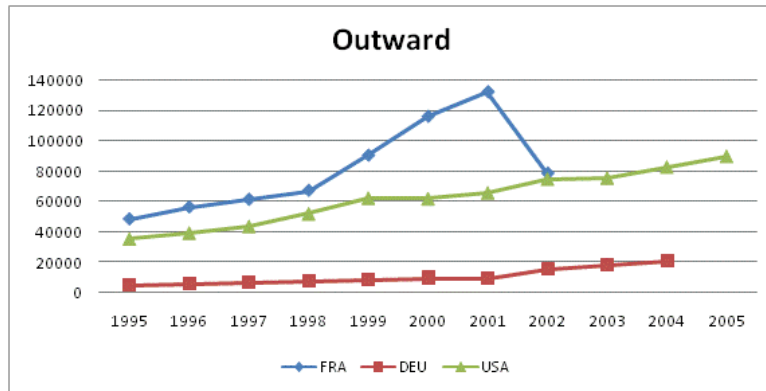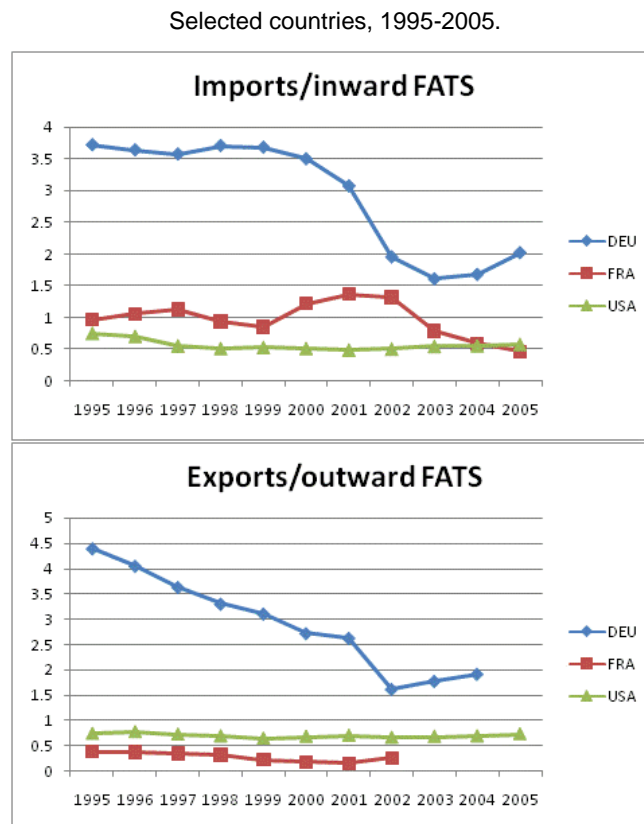Selected countries, 1995-2005, USD mill

Figure 8. Relative importance of mode 1 and mode 3, other business services

Selected countries, 1995-2005.

Source: OECD

23.   Cross-border trade in other business services is the most important in Germany; commercial presence is the most important in the US, while France has switched from cross-border trade to commercial presence being most important. For all three countries the relative importance of commercial presence has increased over time, although a recent reversal is observed in Germany.

4. Driving forces for international trade in business services

4.1 Lessons from the literature based on firm-level data

24.   Developments in information and communication technology are probably the most important driver of trade in business services. All services that are mainly concerned with processing information can in principle be traded over ICT networks. In addition ICT creates new services, including computer services and new services producing content for e.g. internet services. Van Welsum and Vickery (2005) found that about 20% of total OECD employment is in jobs that can potentially be offshored as a result of new developments in ICT. These include jobs that can be codified and which do not require face-to-face interactions.

25.   There is no doubt that services trade over electronic networks has increased rapidly, but it is also clear that few services can be characterised by information processing only, and electronic transmission is often complemented by other activities. First, much of business services trade is intra-firm trade. Thus, multinational companies tend to establish regional services centres in selected countries and use these as a

base for cross-border supply to their affiliates in a region. This is for instance a major driving force for Ireland's trade in computer services as multinationals have established services centres for their EU operations there (Grimes, 2006). Second, tasks that can in principle be traded over electronic networks are often sold as part of a package in which there are tasks that requires face-to-face interaction from time to time.

26.   A recent study from the Birmingham city region in the UK found that about 60% of the clients of computer, marketing and design firms were located in the local region, about 30% in the rest of the UK while about 4% were in the rest of EU and 6% in the rest of the world. For consultancy and accountancy almost 80% of clients were found in the local region, while 15% were in the rest of UK and 5% abroad (Daniels and Bryson, 2002).[9] The Birmingham study covered both large and small companies and there appeared to be no systematic relation between firm size and exports. The study does, however, indicate that the large exporting services firms tend to locate in major cities such as London.

27.   A key to understanding driving forces for trade in business services is the relationship between business services provider and client and how such relations are formed. Tordoir (1995) provides a typology of relationships distinguishing between three types: sparring relations; jobbing relations; and sales relations. Sparring relations typically involve management consulting and other highly knowledge-intensive services that support strategic processes in client firms. Such services involve frequent face-to-face interaction and cannot easily be provided at a distance. Jobbing relations refer to situations where the client has defined a specific task for the business services firm to provide. Often the client supervises the service provider, but frequent face-to-face interaction may not be necessary. Finally, sales relations involve more standardised services that business services providers may develop independently and sell to many clients. Examples are some computer services and some market intelligence reporting. Obviously the most tradable tasks stemming from these relationships are tasks in the third category.

28.   Turning to how client – business services provider relationships are formed, detailed case studies and surveys have found that personal knowledge of individual professionals is important for establishing a contractual relationship with a business services provider. For small and medium sized enterprises (SMEs) this usually implies that the business services supplier is found in the same location as the client. A somewhat dated study (Wood, 1998) found that more than two thirds of the SMEs surveyed in the European Union sourced consultancy services in their local region and more than 90% in their home country. Large companies in contrast search for state-of-the-art inputs wherever they can be found. Furthermore, multinational companies tend to encourage their business services suppliers at home to set up business in the host countries of their affiliates. In addition they source business services in the host countries in order to get access to local expertise on culture, legal systems and other relevant features of the business environment. Multinational business services firms also typically hire local staff in order to obtain such expertise (Bryson *et al*. 2004).

29.   An in depth study of Ireland provides further information on the nature and driving forces for trade in business services (Grimes, 2006). Strong complementarities between manufacturing and business services are found and a functional relationship between the internationalisation of both activities is emphasised. First, international production networks require a number of supporting supply chain management services, including computer and information services. Second, manufacturing subsidiaries require a number of supporting sales and marketing services. Third, moving up the value chain in manufacturing typically goes together with higher services content embedded in the manufactured product.[10] It is indeed the case that services trade grows at the same pace as merchandise trade and has

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[9] The study is not more precise than this as far as sector classification is concerned.

[10] Other studies that have found strong interdependence between manufacturing and business services activities are Francois (1990), Diaz Fuentes (1998) and Guerrieri and Meliciani (2005).

constituted a constant share of total trade for decades. Business services have increased their share in services trade, but this could well reflect the fact that internationalisation of supply chains requires more intensive use of business services in order to coordinate activities located in several countries.

30.   A somewhat different approach to assessing tradability of services is a recent study from the United States. It argues that services that can be traded within the country can also be traded across international boundaries. Industries that are concentrated geographically while servicing large parts of the country are according to this criterion tradable. Industries are classified into three groups according to a measure of geographical concentration.[11]   Computer and information services are found in the most tradable group, while the other business services covered by this study are assigned to the middle group (Jensen and Kletzer, 2005). The study does not discuss why distance is moderately important for business services, but from the literature reviewed here, one would expect that relatively frequent face-to-face interaction is important as well as is local knowledge on the part of the services supplier.

31.   To summarise, business services are experience goods and personal knowledge of services suppliers is important for establishing a relation between services supplier and client. The need for personal knowledge has implications for the way business services are traded. First, trade costs in business services are related to the costs of searching for a suitable supplier; and entering and monitoring a contract. Imperfect contracts are likely to be the norm rather than the exception because it is difficult to know exactly what are the competencies of the business services firm, it may be difficult to describe in a contract exactly what the task purchased should be and given that difficulty, it is also difficult to assess to what extent the supplier has fulfilled the contract. Establishing such contracts across borders is usually more difficult than within the same jurisdiction which by itself is likely to give rise to a strong home bias. One would therefore expect cross-border trade to take place mainly in services tasks that can be standardised and transmitted over electronic networks. Some computer and information services fall into this category. For most business services commercial presence appears to be an increasingly important mode of supply and both cross-border supply and commercial presence need to be complemented by movement of natural persons.

4.2 The role of market size and geography, a gravity analysis

32.   The gravity model is a widely used tool for analysing the relation between trade flows and trade barriers. Briefly the model states that bilateral trade is a function of the relative market size of the trading partners and the relative distance between them.[12]   Relative distance is correlated with the ease at which goods and services flow between two countries (relative to other possible trading partners) and reflects transport costs, cost of business travel, and other costs related to differences in culture, legal framework and preferences, which tend to increase with distance.

33.   Before using the model, its limitations should be borne in mind. First, the model explains the direction of trade better than total world trade and captures how *differences* in bilateral trade costs affect trade patterns. Thus, if trade costs were reduced uniformly across all country pairs, there would be no effect on the direction of trade.[13]   This feature makes the gravity model very useful for analysing the

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[11] The measure is the Gini-coefficient of geographical dispersion of a sector.

[12] The *relative* market size refers to the market size of each trading partner relative to all other potential trading partners in the world. In addition the market size of two trading partners relative to each other matters. Relative distance refers to the distance between the two trading partners relative to the distance to all other potential trading partners.

[13] This is why most studies find that the importance of distance has not changed for the pattern of world trade in spite of substantial reductions in communication costs. When the reduction is due to innovations in the ICT sector, and all countries have access to the new technology, this should be expected. Egger (2008) finds

impact of barriers to trade that vary with distance or trading partner for reasons such as preferential trade agreements. It is, however, less useful for analysing country-specific trade and regulatory barriers that do not vary with trading partner. Second, the model is better at explaining total trade flows by trading partner than trade flows by sector.[14] The third limitation is a practical one. When applied to services trade there is a scarcity of bilateral trade statistics, and the problem is more severe the more disaggregated the data. Not only are data scarce, also the quality leaves a lot to be desired.

34. With these caveats in mind, a new version of the gravity model is used for a quantitative assessment of natural barriers to trade in computer and business services. As explained in the introduction, the purpose of this analysis is to assess the tradability of the services covered by this study. A recent paper by Egger (2008) shows that the impact of distance on bilateral trade flows is not uniform and varies with both market size and income levels.[15] Egger's suggested methodology is applied to trade in business services (EBOPS 268) and computer and information services (EBOPS 262). The results are largely in line with what he found for goods and are presented in Table 3.

Table 3. OLS gravity regressions on determinants of trade in business services

Dependent variable: log imports

Variable	Other business Services	Computer and Information services
log distance	-8.08 (0.30)***	-10.22 (0.62)***
log distance*log GDP importer	0.09 (0.01)***	-0.03 (0.01)**
log distance*log GDP exporter	0.13 (0.00)***	0.13 (0.01)***
log distance*log GDP per capita importer	0.36 (0.03)***	0.61 (0.07)***
log distance*log GDP per capita exporter	0.08 (0.01)***	0.16 (0.02)***
Common border	0.33 (0.08)***	0.29 (0.13)**
Common language	0.59 (0.08)***	0.37 (0.14)***
Both EU	0.68 (0.09)***	1.04 (0.15)***
country*time dummies	Yes	Yes
N	3591	2660
R^2 Adjusted	0.89	0.78

Note: t-statistics are in parentheses, ***, and ** signify statically significance at a 1% and 5% level respectively

35. Contrary to popular perceptions, distance is highly relevant for cross-border trade both for computer and information services and other business services. However, the marginal impact of distance

that for merchandise trade the relative importance of distance has increased over time and the marginal effect of distance is different for different countries.

[14] When applied to a sector most versions of the model implicitly or explicitly assume that demand for goods or services in the sector in question is separable from demand from other goods and services. As has been argued in this study, this is unlikely to be the case for business services.

[15] Egger also argues that when using time-varying data, country fixed effects will not capture the price indices that are entailed in the so-call multilateral resistance terms in the gravity model. In order to capture the price effects correctly, the country dummies need to be interacted with the time dummies.

is smaller for large countries and countries with high income per capita. Thus, GDP and GDP per capita in both the importing and exporting country reduce the marginal impact of distance on bilateral trade.[16] Countries with a common border tend to trade about a third more with each other than countries without a common border. Furthermore countries that share a common official language tend to trade about 40% more other business services and 80% more computer services with each other.

36.   To illustrate what the results on distance imply, we did comparative statics for the country that came closest to the median GDP, which is the Netherlands in this sample. Consider two countries, A and B that are both similar in size and GDP per capita as the Netherlands. The marginal impact of distance for their exports to the Netherlands would be -0.67 for other business services and -0.95 for computer services. This implies that if country A is 10% further away, the Netherlands would import 6.7% less business services and 9.5% less computer services from A than from B country. Should countries A and B be one standard deviation larger and richer than the Netherlands, then the marginal impact of distance is -0.44 for other business services and -0.69 for computer services. Finally, if A and B are one standard deviation smaller and poorer than the Netherlands, the marginal impact of distance would be -0.9 for other business services and -1.21 for computer services. The disadvantage of remoteness is in other words larger the smaller and poorer the country.

37.   The regression results also shed some light on the role of policy in services trade flows. A dummy which is one if in a country pair both are members of the European Union and zero otherwise was included. The result suggests that market integration within the European Union is strongly associated with higher trade value. EU countries tend to trade about twice as much other business services and almost three times as much computer and information services with each other than what would be the case in the absence of the common market. Services trade has in principle been open within the European Union since the single market opened in 1992. Yet, even if the *level* of intra-EU trade is larger than what would be the case without the internal market, intra-EU trade in business services has stagnated in recent years (Kox and Lejour, 2007). A likely reason is that emerging markets have taken market shares as a result of improvements in ICT technology, and countries such as India have a comparative advantage in production of the services that can most easily be codified and transmitted over electronic networks.

38.   In spite of the common market it has been recognised that barriers to trade in services remain and the EU markets are far from fully integrated in the services market. The EU services directive aims at lowering legal, administrative and practical obstacles to services trade. It was introduced in 2006 and will be fully implemented by the end of 2009. While remaining obstacles to services trade are apparent, an in depth study of the impact of the internal market would be useful. After all, intra-EU trade is higher than it would have been without the internal market; the internal EU market is among the most open regional services markets in the world. An in depth study would help identify the importance of explicit barriers to trade and investment and distinguish them from behind the border regulatory barriers.

39.   In order to get the full picture of trade in business services it is also necessary to take into account the fact that many country pairs do not trade with each other. In our database there are 3349 observations of bilateral trade flows in computer and information services of which 890 are zero and for other business services there are 3990 observations of which 157 are zero. It is likely that the decisions that firms take about whether or not to enter a foreign market is a more fundamental one than the decision whether or not to sell one extra unit in a market where it is already established. We therefore believe that one should analyse the determinants of market entry separately. Nevertheless we expect that some of the same factors

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[16] There are four times more observations for computer and information services than for computer services alone, and regressions results are therefore more robust for this more aggregated category.

that determine how much is imported or exported also determine whether or not there is positive trade.[17] Thus one would expect that being far apart, having different languages, different cultures and different regulatory systems would discourage or increase the cost of entry. In contrast sharing a border or being partners in a trade agreement that includes services trade liberalisation would encourage market entry. A French firm, when considering which markets to enter into is for instance more likely to enter other EU members. And among the EU members it is more likely to enter the immediate neighbours and among those the French-speaking ones would be the most attractive. When moving further afield it is again likely to prefer French-speaking destinations. The determinants of market entry are presented in Table 4.

Table 4. Probit gravity regressions on determinants of trade in business services

Dependent variable: dummy = 1 if trade > 0, zero if trade = 0.

	computer services	Other business services
Ln distance	-6.273*** (1.81)	-10.78 (6.26)
Ln distance*GDP importer	0.206*** (0.2)	0.523*** (0.046)
Ln distance*GDP exporter	0.0721*** (0.0095)	0.181*** (0.04)
Ln distance*GDP per capita importer	0.101 (0.2)	-0.0603 (0.74)
Ln distance*GDP per capita exporter	0.0902*** (0.016)	0.108** (0.047)
Border	0.986*** (0.35)	
Common language	1.174*** (0.34)	1.256 (1.24)
Both EU	1.080*** (0.32)	
Constant	13.91*** (2.91)	20.15*** (4.82)
Observations	2103	544

40. A first thing to notice is the low reported number of observations for other business services. The reason is that sharing a common border perfectly predicts market entry. E.g. all adjacent countries in our sample trade other business services with each other. Likewise all members of the European Union in our sample trade other business services with each other.[18] As was the case for trade flows, the impact of distance on the probability to enter the market is not uniform and is smaller the larger the trading partners and the richer the exporter.

41. As noted above, the relative importance of commercial presence has increased in recent years and it is of interest to analyse the determinants of commercial presence as well. Unfortunately data on sales of foreign affiliates by home country of majority owner and host country of affiliate is not available. Stocks

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[17] When analysing data at the sector level, an increase in trade reflects a combination of new firms entering the market and existing firms expanding their sales in existing markets. We cannot distinguish the two unless we have firm level data or we know the productivity distribution of the firms. It has been shown that if there are entry costs, the firms with a high enough productivity to recover the entry costs in the foreign market will enter.

[18] When success or failure is perfectly predicted by an explanatory variable, the observations in question are dropped from the sample.

of foreign direct investment can, however, be used as a proxy for sales of foreign affiliates as it is likely that capital stocks and sales volumes move in tandem. Data on bilateral stocks of foreign direct investment is available for the OECD countries and some large non-OECD countries. Data on inward and outward stocks by sector is also available. This information was used to extrapolate bilateral FDI stocks by sector.[19] These data are used for making a first estimate of the determinants of foreign direct investment in the business services sectors, using the same model as for cross-border trade. The results for determinants of the size of positive FDI stocks in other business services (ISIC 74) were robust to different specifications and estimation techniques, while regressions on computer services were less robust.[20]

Table 5. OLS gravity regressions on determinants of FDI in business services

Dependent variable: log inward FDI stocks

Ln distance	-5.495***
	(1.716)
Common border	0.482**
	(0.204)
Common language	0.760***
	(0.182)
Both EU	1.190***
	(0.205)
Ln distance x GDP host	0.0321
	(0.0412)
Ln distance x GDP investor country	0.144***
	(0.01)
Ln distance x GDP per capita host	0.26
	(0.174)
Ln distance x GDP per capita investor country	0.0157
	(0.0157)
Constant	3.299***
	(0.964)
Observations	2295
R-squared	0.778

42.   Foreign investment in other business services appears to fall off sharply with distance, although large countries have a larger propensity to invest further a field. Sharing a border, a language or EU membership matters for FDI volumes as well as for trade. The results for computer services were less robust and it turned out to be difficult to make estimates that were stable across estimation techniques. The same goes for estimating the probability for entering the market for both computer services and other business services. The problem is related to the difficulty of distinguishing between zero investments and lack of information about investments.

43.   As discussed above, it is likely that business services providers supply their services through several modes and that modes therefore are complementary rather than independent. Establishing a foreign

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[19] The methodology is documented in a forthcoming paper that will be presented to the services trade statistics meeting in September.

[20] OLS estimates using Egger (2008) specification and country * time dummies were applied (presented), the same was Poisson Pseudo maximum likelihood, zero inflated Poisson and Heckman regressions. For the latter we have not so far been able to find the identifying variable.

presence often requires services from the headquarters and in many cases companies establish services centres for a region in a particular country. This is particularly relevant for computer services. In addition face-to-face interactions with clients are necessary from time to time for most services and cross-border trade therefore often needs to be supported by movement of natural persons. The estimates of cross-border trade and commercial presence may therefore not be independent. Since data on sales through commercial presence and movement of natural persons are relatively poor, it is difficult to test this hypothesis in a robust manner. Nevertheless, we tested whether the regressions on FDI and cross-border trade are independent by using seemingly unrelated regressions (SUR) and found that they are not independent.[21] Further, we estimated the cross-border trade and investment regressions simultaneously and found that cross-border bilateral imports are positively related to the bilateral inward stock of FDI in the sector (as well as the total bilateral FDI stock). The statistical significance of this result, does however, depend on the specification of the model and the nature and strength of complementarity needs to be further explored, but the evidence so far points to complementarity between modes of supply.[22]

4.3 Using the gravity model for estimating the STRI[23]

44.   If the problems related to estimating the gravity model on sector data can be solved, the model can be a very useful tool for assessing the overall restrictiveness of a country's regulatory regime or business environment. As shown by Anderson (2007) the so-called multilateral resistance term in the gravity equation corresponds to the theoretically correct "true" trade restrictiveness index that was developed by Anderson and Neary (2005). Multilateral resistance terms reflect the incidence of trade costs and are introduced as a country-specific price index in the gravity model.

45.   Estimating this multilateral resistance term or price index is not an easy task and several attempts have been made in the literature. Anderson and van Wincoop (2003) in their seminal paper estimated the resistance terms by using general equilibrium market clearing conditions and derived an implicit solution where the price index depends on the country's share in world income, bilateral trade barriers and the elasticity of substitution between products from different sources. The methodology requires non-linear least squares estimates, which is quite complex. A number of subsequent papers therefore argued that since the multilateral resistance term is a country-specific variable it can be captured by country-fixed effects; a much simpler approach. Egger (2008) points out that when using panel data the country fixed effects need to be interacted with time dummies in order to capture the fact that the multilateral resistance terms vary over time.

46.   A somewhat different approach is taken by Baier and Bergstrand (2006) who suggest using a first order log-linear Taylor-series expansion to approximate the multilateral resistance terms. In practice this means that the price indices can be estimated exogenously and it is possible to estimate the impact of country-specific variables such as domestic regulation on bilateral trade patterns by correcting for multilateral resistance.

47.   This paper, following a number of other studies, has shown that the gravity model can be applied with reasonable success to trade in services, provided adequate quality and coverage of data are available.

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[21] SUR refers to Seemingly Unrelated Regressions and is an estimation technique that reveals whether the error terms are correlated in regressions that are seemingly unrelated but using the same data.

[22] We ran a three-stage OLS regression in Stata. When including the variables suggested by Egger (2008) only, the results suggested a strong one-directional complementarity, cross-border trade is positively related to bilateral FDI stocks, but not the other way around. When adding other explanatory variable, the statistical significance of the FDI stock weakens, however.

[23] This section is somewhat technical and can be skipped by readers that are not concerned with the technical details.

It is therefore suggested that the gravity model can be used for estimating the aggregate STRI for total services as well as for individual services sectors including computer and information services and business services. At what level of detail business services can be estimated, will depend on the availability of data. A first step that would be most appropriate for ranking countries according to trade restrictiveness is to use the Egger (2008) methodology and rank countries according to the estimated parameters on the country*time dummy. Ways of taking into account complementarities between modes of supply would need to be further explored in order to do so.

48.   This would be a "top down" approach that would not convey any information about policy and the relative contribution of policy measures to trade restrictiveness. The "top-down" approach therefore must be complemented by a "bottom up" approach where the link between and policy and trade restrictiveness is established. This is further discussed in the next section.

5. Barriers to trade in business services

49.   The business services covered by this study are largely competitive and lightly regulated in most countries. The exceptions are advertising and labour recruitment, which are subject to specific regulation in many countries. These may be non-discriminatory, for instance reserving some labour recruitment services for government agencies and banning advertising for certain products (e.g. tobacco, alcohol and drugs) or directed towards certain target groups (e.g. children). Different regulatory practices in different countries nevertheless constitute additional costs for foreign services providers who must adjust their products to each market (Kox and Nordås, 2007). Furthermore, differences in the regulation of advertising can also constitute a trade restriction on other services to which advertising is an important source of revenue, for instance audiovisual services.

50.   There are few explicit barriers to trade and investment in computer services and other business services. In order to assess trade restrictiveness in this sector, we therefore need to analyse the restrictiveness of horizontal general regulations that explicitly or implicitly restrict trade in computer and business services.

5.1 The role of government

51.   Government procurement is an important source of demand for business services. We therefore start our assessment by analysing the relative importance of government as a market for these services and explore to what extent government procurement practices affect trade and investment in business services. An analysis of the input-output tables for the three largest economies in the OECD area, USA, Japan and Germany provides some insights into the role of government in demand for business services.

Table 6. Government share of expenditure on business services

	USA		Japan		Germany	
	% of total	% imported	% of total	% imported	% of total	% imported
Intermediate demand						
Computer and related	8.7	0.3	5.3	5.1	6.6	18.3
Other business services	10.4	0.5	8.0	1.7	4.9	6.0
Government consumption						
Computer and related	5.4	0.6	0.0	0.0	0.0	0
Other business services	0.0	0.0	0.0	0.0	0.0	0

  Source: Calculated from the OECD input-output tables.
Note: % of total refers to government purchases in each category as a share of total gross output in the sector in question. E.g. 8.7% of gross output in computer and related services in the US was purchased as intermediate inputs by the government. Government intermediate purchases are defined as purchases by public administration, defence and compulsory social security, education and health. Import share refers to imports value as a share of total value in the category in question. E.g.0.3% of US government procurement of intermediate computer and related services was imported.

52.   It is evident from this table that government accounts for a significant share of total expenditure on business services, particularly computer and related services. This share may have increased since the year 2000, since a number of governments have embraced outsourcing in order to reign in growth in budgetary expenditure.   The US and Japanese governments imported a very small share of total government procurement, while the import share is quite substantial in Germany. Comparing import penetration in government spending in Table 6 and import penetration for total domestic expenditure in Table 2 suggests that the import propensity in government procurement is not lower than for the economy at large for these three countries. To the contrary, the German government has a higher import share than the economy at large. The German figures thus show the potential for government demand driven trade in business services and that access to government procurement or lack thereof could be an important determinant of trade in business services. The role of public procurement as a market for business services is recognised by the European Union which lists several measures improving public procurement procedures as part of recommendations to strengthen competition in business services.[24]

5.2 General regulation

53.   As already mentioned, there are few explicit barriers to trade and investment in the business services sectors in the OECD countries. The most relevant trade costs in business services are related to the costs of communication and the mobility of natural persons (Grimes, 2006). On both these indicators comparable data are not readily available for statistical analysis and we were unable to assess to what extent these factors restrict trade.

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[24] See http://ec.europa.eu/internal_market/services/docs/brs/forum/2005-report_en.pdf

54.   An important source of information on regulation is the OECD product market regulation (PMR) questionnaire. It has no specific questions for computer services while the only question directed towards business services other than professional services relates to public ownership. The countries that declared that national, state or provincial government control at least one firm in other business services were Germany, Iceland, Italy, Poland and Spain in 1998. The same countries plus New Zealand had government control of at least one company in 2003. Recall, however, that ISIC 74 includes the professional services and we do not know from the survey in which sub-sector public ownership control applies.

55.   Otherwise the sector is subject to the general regulation that prevails in the country and we therefore need to identify which regulatory measures have a trade-restricting effect on business services. As a starting point we assess which horizontal regulatory measures included in PMR indicators are negatively and statistically significantly correlated with trade in computer services and other business services. The PMR questionnaire covers a number of regulatory areas. The individual questions are aggregated using a hierarchy of sub-indicators (Conway *et al*. 2005). A number of business surveys reported in the literature indicate that business services providers are likely to consider the regulatory regime or what is more loosely defined as the business environment, when deciding whether or not to enter a market. It is therefore conceivable that even if an individual regulatory measure does not have a discernible impact on trade, it may contribute to an overall unfavourable business environment that does have a negative effect on services trade. Conversely, a restrictive regulatory measure may not have a discernible effect on business services trade if it is seen as a small price to pay in an otherwise promising market and business friendly environment.[25]

56.   A logical way of identifying trade restrictive regulations for business services is therefore to start at the top of the PMR hierarchy and check to what extent the aggregate regulatory index is negatively correlated with trade in business services. If it is, we move to the next level in the hierarchy and test which sub-indicators are negatively correlated with trade and so on down to the individual question. Taking this approach, we find that both computer and information services (EBOPS 262) and other business services (EBOPS 268) exports are negatively correlated with the aggregate PMR indicator in the importing country. Likewise imports in both sectors are negatively correlated with the aggregate PMR index in the importing country. At the second level of aggregation, regulation is divided into inward-oriented versus outward oriented policies.[26] At the third level regulation is divided into economic versus administrative regulation.[27] We correlated both these measures with cross-border trade flows using Spearman rank correlations.[28] Since the PMR indices are country-specific and apply to all services suppliers irrespective of origin, it is natural to correlate them with total trade. Only indices with a Spearman rank correlation at a significance level of 5% or better are included. The results are reported in Table 7.

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[25] This is a similar to the argument that distance may have a different effect depending on the size and diversity of the trading partners and could be captured by interaction terms in the gravity regression.

[26] PMR outward oriented policies contain the policies under the second level heading "barriers to trade and investment", while inward oriented policies contain the two second level headings "State control" and "Barriers to entrepreneurship".

[27] PMR economic regulation refers to sub-headings "Public ownership", "Involvement in business operations", "Barriers to competition", "Explicit barriers to trade and investment" and "Other barriers", while administrative regulation refers to the sub-headings "Regulatory and administrative opacity" and "Administrative burden on start-ups".

[28] Spearman rank correlations are less sensitive to extreme values than the commonly used Pearson correlation coefficient.

Table 7. The PMR regulatory hierarchy – the measures that are negatively and significantly associated with cross-border trade.

Level	Indicator	262 E	262 O	268 E	268 O
1	PMR		x		x
2	PMR inward	x	x	x	x
	PMR outward		x		x
	PMR administrative		x	x	x
	PMR economic	x	x		x
3	State control	x	x	x	
	Barriers to entrepreneurship		x		x
	Barriers to trade and investment		x		x
4	Public ownership	x	x	x	x
	Administrative burdens on start-ups	x	x		x
	Explicit barriers to trade and investment		x		x
	Other barriers		x		x
5	Direct control of business enterprises		x	x	x
	Size of public enterprise sector		x		x
	Scope of public enterprise sector			x	
	Communication and simplification of rules and procedures		x	x	x
	Administrative burdens for corporations		x	x	x
	Administrative burdens for sole proprietor firms			x	x
	Discriminatory procedures				x
	Foreign ownership barriers		x		x
	Regulatory barriers		x		x
FDI restr.	FDI restrictiveness index for ISIC 74 business services		x	x	x

Note: E refers to market entry while O refers to ongoing operations.

57.   A word of caution is warranted before discussing the results. First, correlation does not imply causality and we cannot conclude from the results that the indicators included in the table restrict trade in services. They are, however, candidates for further investigation into whether or not they have such effects. Conversely, if indicators are found not to be correlated with trade flows, we cannot categorically say that they are not important. Nevertheless, they could be put on the backburner for the time being unless strong evidence from other sources, e.g. expert judgement, suggests that they should be included in the index. Second, it should also be emphasised that although all indicators included in Table 7 are highly significant in terms of statistical significance, the correlation coefficients are relatively small, hovering around -0.2 to -0.6. Third, the quality of services trade data at the sectoral level leaves a lot to be desired and the analysis needs to be firmed up as better data becomes available.

58.   With these caveats in mind there are some interesting results that warrant further investigation. First, inward-oriented policies which comprise indicators related to state control and barriers to entrepreneurship are significantly related both to foreign entry and trade values, while outward-oriented policies under which barriers to trade and investment fall, are correlated to trade values only. This suggests that the same inward-oriented regulations that increase the barriers to entry for local firms also deter foreign suppliers. State control has the same properties as inward oriented policy and seems to be driving the result for inward oriented policies.[29]

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[29] State control could was tried as a separating variable in Heckman regressions of the gravity model since it appears to have an impact on market entry, but not on trade flows. It actually appears with a strong and negative coefficient in the selection function and produces a positive and highly significant lamda.

Second, we observe that fewer indicators are significantly correlated with foreign entry and trade in computer and information services than in other business services. This is probably because computer services are more standardised and require fewer local inputs than other business services. Third, we also explored to what extent cross-border trade is correlated with restrictions on foreign direct investment in the sector in question. The OECD FDI restrictiveness index is available for ISIC sector 74 (but not ISIC 72). The FDI restrictiveness had the highest rank correlation coefficient of all that are included in the table. Again results must be interpreted with caution, but point in the direction of complementary between modes of supply.

59.   One surprising finding is that licensing and permit systems are not significantly related to cross-border trade. Since this is explicitly mentioned in the GATS as a source of trade restrictions, we need to further investigate this finding. One possibility is that there is too little variation in this indicator among OECD countries. Which sub-indicators contribute the most to the variation in the PMR indicators will be analysed later as the results of the new survey for 2007/08 becomes available.

Commercial presence

60.   We also did Spearman rank correlations between the PMR indicators in the host country and inward foreign investment. Foreign direct investment does not correspond to commercial presence, but it is usually necessary to invest in a country in order to have a commercial presence there.[30] FDI stocks are therefore used as an imperfect proxy for commercial presence. Data on FDI is much more aggregated than trade data, so we are only able to study correlations at the aggregate ISIC 74 level.

Table 8. The PMR regulatory hierarchy – the measures that are negatively and significantly associated with FDI stocks, Other business services (ISIC 74).

Level	Indicator	ISIC 74
1	PMR	x
2	PMR inward	x
	PMR outward	x
	PMR administrative	x
	PMR economic	x
3	State control	x
	Barriers to entrepreneurship	x
	Barriers to trade and investment	x
4	Public ownership	x
	Government involvement in business operations	x
	Administrative burdens on start-ups	x
	Explicit barriers to trade and investment	x
	Other barriers	x
5	Direct control of business enterprises	x
	Size of public enterprise sector	x
	Scope of public enterprise sector	x
	Communication and simplification of rules and procedures	x
	Use of command and control regulation	x
	Administrative burdens for corporations	x
	Administrative burdens for sole proprietor firms	x
	Discriminatory procedures	x
	Regulatory barriers	x
FDI restrictions	FDI restrictiveness index for ISIC 74 business services	x

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[30] Commercial presence can also be obtained without FDI e.g. through franchises or strategic alliances.

61.   The restrictions with a significant effect on trade and investment appear to be pretty much the same, but FDI appears to be more sensitive to government intervention in the economy including administrative barriers, as one might expect.

62.   The next step towards developing an STRI for these services is to score and weight the indices with the purpose of developing a regulatory profile. This is a "bottom up" approach that will complement the top down approach suggested in the previous section. The scoring and weighting will be based on several methodologies. A first input will be expert judgement from the services expert meeting 24 June. A second step will be using principal component analysis in order to identify which regulatory measures contribute the most to the variation in the regulatory profile. A third approach is to assign weights based on the trade impact of the regulatory measures. The Baier and Bergstrand (2006) approach to estimating the gravity model could be used for this purpose.

6. Conclusions

63.   This study has made a first attempt to clarify the issues related to developing a services trade restrictiveness index for trade in business services, broadly defined as EBOPS sectors 262 and 268 except the professional services or ISIC sectors 72 and 74 except the professional services. The implications of the findings in the study for the development of the STRI are the following:

- Computer services are a sector subject to few restrictions on trade and investment in OECD countries and can serve as a benchmark free-trade sector when developing the STRI at the country level.
- It is likely that cross-border trade, commercial presence and movement of natural persons are complementary in business services, particularly the sub-sectors covered by this study under ISIC 74. Therefore, it would be most useful to develop indices for each sub-sector for all modes combined. The indices should be complemented by a regulatory profile that provides information on which restrictions are the binding ones.
- The regulations that should be included in the index would be the PMR indicators contained in Tables 7 and 8, restrictions on commercial presence, restrictions on movement on natural persons and limitations on access to public procurement.
- Additional information on restrictions on access to public procurement and on movement of natural persons is required for building the ideal index. Information from GATS commitments and free trade agreements that includes services will be explored.
- A possible approach to estimate the STRI for the business services sector is to use the gravity model to estimate the inward multilateral resistance terms for cross border trade and commercial presence simultaneously (a top-down approach). In parallel to this work the individual regulatory indicators could be weighted and scored using statistical methods and expert judgement (a bottom up approach). Finally the top-down and the bottom up approaches could be reconciled using statistical methods for establishing the contribution of the regulatory measures to the overall index developed from the top-down approach.

Questions for further discussion:

- In which business services sub-sectors is cross-border trade the major and preferred mode of supplying a foreign market? I.e. in which sub-sectors are face-to-face interactions unimportant?

- What are the major driving forces for trade in business services?

- Technology?

- Demand from client?

- How important is scale for entering foreign markets in the business services covered by this study?

- If you are to name one single regulatory measure that restricts trade in business services, what would that be?

REFERENCES

Anderson, J. E. (2007), "Gravity, productivity and the pattern of production and trade" Mimeo, Boston College, 24 October.

Anderson, J. E. and Neary, P. (2005), *Measuring the Restrictiveness of International Trade Policy,* Cambridge: The MIT Press.

Anderson, J.E. and van Wincoop, E. (2003), "Gravity with gravitas", *The American Economic Review,* 93, 1, 170-192.

Baier, S.L. and Bergstrand, J.H., (2006), "Bonus vetus OLS: A simple approach to addressing the "border puzzle" and other gravity-equation issues", mimeo
http://www.nd.edu/~jbergstr/Working_Papers/BVOLSMarch2006.pdf

Bryson, J.R, Daniels, P.W. and Warf, B. (2004), *Service Worlds; People, Organisations, Technologies,* London: Routledge.

The Commission of the European Communities (2002), "The stat of the internal market for services", COM (2002) 441 Final.

Daniels, P.W. and Bryson, J.R. (2005), "Sustaining business and professional services in a second city region: the case of Birmingham, UK", *The Services Industry Journal,* 25, 4, 505-24.

Diaz Fuentes, D. (1998), "On the limits of post-industrial society: structural change and services sector employment in Spain", *Review of Applied Economics,* 12, 483-495.

Duranton, G. and Storper, M. (2005), 'Rising trade costs? Agglomeration and trade with endogenous transaction costs', CEPR discussion paper no 4933, February.

Egger, P. (2008), "On the role of distance for bilateral trade", *The World Economy*, 653-662.

Francois, J.F. (1990), "Trade in producer services and returns due to specialization under monopolistic competition", *Canadian Journal of Economics,* 23, 109-124.

Grimes, S. (2006), "Ireland's emergence as a centre for internationally traded services", *Regional Studies,* 40, 1041-1054.

Guerrieri P. and Meliciani, V. (2005), "Technology and international competitiveness: the interdependence between manufacturing and producer services", *Structural Change and Economic Dynamics* 16, 489-502.

Kox H. and Lejour, A. (2007), "The European internal market for business services: No open borders yet", Chapter 13 in Rubalcaba, L. and Kox, H. (eds), *Business Services in European Economic Growth,* Houndmills: Palgrave MacMillan.

Kox, H. and Nordås, H.K. (2007), "Services trade and domestic regulation", OECD Trade Policy Working Papers no 49.

Lesher, M. and Nordås, H.K. (2007), Business services, trade and costs, OECD Trade Policy Working Paper no 46..

Markusen, J. R. (1989), "Trade in producer services and in other specialized intermediate inputs", *The American Economic Review,* 79, 85-95.

Miles, I. (2007), "Business services and their users: a literature review", Chapter 2 in Rubalcaba, L. and Kox, H. (eds), *Business Services in European Economic Growth,* Houndmills: Palgrave MacMillan.

Pilat, D. and Wölfl, A. (2005), "Measuring the interaction between manufacturing and services", OECD STI Working Paper no 2005/5.

Robert-Nicoud, F., (2008), "Offshoring of routine tasks and (de)industrialisation: Threat or opportunity – And for whom?", *Journal of Urban Economics,* forthcoming.

Rubalcaba, L. and Kox, H., (2007), "The growth of European business services", Chapter 1 in Rubalcaba, L. and Kox, H. (eds), *Business Services in European Economic Growth,* Houndmills: Palgrave MacMillan.

Tordoir, P.P. (1995), *The Professional Knowledge Economy: The Management and Integration of Professional Services in Business Organizations,* Dordrecht: Kluwer Academic Publishers.

Van Welsum, D. and Vickery, G. (2005), "Potential offshoring of ICT-intensive using occupations", DSTI Information Economy Working Paper DSTI/ICCP/IE(2004)19/FINAL

Wood, P. (1998), "Services and internationalisation. Report to the RESER network", http://www.reser.net/index.php?action=article&numero=124#1