



**Sam Houston State University
Department of Economics and International Business
Working Paper Series**

U.S. Trade in Information-Intensive Services

Hiranya K. Nath
Sam Houston State University

Uday M. Apte
Naval Postgraduate School

SHSU Economics & Intl. Business Working Paper No. 12-02
February 2012

Abstract:

Trade in services has increased significantly and the United States has been a leader in services trade. The U.S. not only accounts for the largest share of world trade in private services but also runs a substantial amount of surplus in services trade. One important trend has been the rapid growth of U.S. trade in information-intensive services. This paper examines the growth and patterns in U.S. exports and imports of various information-intensive services. The analysis indicates that trade in business, professional, and technical services; financial services; and insurance has experienced the most rapid growth in recent times. This paper further discusses some of the intuitively plausible explanations for the growth of trade in information-intensive services.

U.S. Trade in Information-Intensive Services

Uday M. Apte*

Hiranya K. Nath†

Abstract: Trade in services has increased significantly and the United States has been a leader in services trade. The U.S. not only accounts for the largest share of world trade in private services but also runs a substantial amount of surplus in services trade. One important trend has been the rapid growth of U.S. trade in information-intensive services. This paper examines the growth and patterns in U.S. exports and imports of various information-intensive services. The analysis indicates that trade in business, professional, and technical services; financial services; and insurance has experienced the most rapid growth in recent times. This paper further discusses some of the intuitively plausible explanations for the growth of trade in information-intensive services.

Keywords: Trade in services; information-intensive services; information and communications technology (ICT)

JEL Classification: F14; F19

* Graduate School of Business and Public Policy, Naval Postgraduate School, Monterey, CA 93943; E-mail: umapte@nps.edu

† Department of Economics and International Business, Sam Houston State University, Huntsville, TX 77341-2118; E-mail: eco_hkn@shsu.edu; Phone: 936-294-4760.

1 Introduction

There has been a significant increase in services trade across the world in recent decades and the U.S. has been at the forefront of this development. The U.S. is not only the largest exporter as well as importer of services but also has a surplus in services trade. This is despite the fact that it has been running an overall trade deficit for over three decades. One of the driving forces behind this growth has been the unprecedented advances in information and communication technologies (ICT). These technological advances have enhanced tradability of information-intensive services. These are the services that involve creating, processing, and communicating information. Because of the technology, these services do not require physical presence of producers and consumers in the same location, a trait that traditionally characterizes services. Since the U.S. is the vanguard of ICT advances and ICT-enabled service innovations, it clearly has a comparative advantage in information-intensive services.

The main objective of this paper is to examine the major trends and patterns of U.S. trade in information-intensive services. Since the interest in services trade is relatively new, the literature that focuses on this area of trade has been taking shape only in recent times. A lack of reliable data has also been a formidable constraint. This, in turn, is related to the issues on how to measure services and what constitute trade in services. However, as the Bureau of Economic Analysis (BEA) in the U.S. and international organizations, such as World Trade Organization (WTO) and United Nations Conference on Trade and Development (UNCTAD), have started publishing detailed data on services trade, researchers have also embarked on studying trade in services using empirical data. Thus, a large number of articles on this topic have appeared in last two decades or so.

There are several strands of this literature. There are some studies that examine the determinants of international trade and investment in services (e.g., Polese and Verreault 1989; Freund and Weinhold 2002; Grunfeld and Moxnes 2003; Kimura and Lee 2006; Co 2007; Mann and Civril 2008). There are others that focus on gains from trade in services in terms of productivity and growth (e.g. Mattoo et al. 2006; Hoekman and Mattoo 2008; Amity and Wei 2009). Further, some other studies discuss policy issues related to services trade (e.g. Bhagwati 1987; Hoekman 1996; Deardorff 2001; Hoekman et al. 2007; Deardorff and Stern 2008). Francois and Hoekman (2010) give a comprehensive review of these different strands of the literature. To the best of our knowledge, none of these studies provides a comprehensive account of growth and patterns of U.S. trade in information-intensive services, the largest segment of services trade in the U.S.

The rest of the paper is organized as follows. Section 2 presents an overview of trade in services. This section is divided into 3 subsections. In Subsection 2.1, we include a brief history of trade in services. Subsection 2.2 discusses the definitional framework for trade in services, as adopted by the General Agreement on Trade in Services (GATS). In Subsection 2.3, we briefly discuss current trends and patterns of world trade in services as well as of the U.S. trade in services. In Section 3, we discuss some theoretically plausible intuitions behind the rapid growth of trade in information-intensive services. Section 4 focuses on the U.S. trade in information-intensive services. It discusses in details the composition and growth of various information-intensive services. A discussion on decomposition of trade into affiliated (intra-industry) and unaffiliated trade; and leading destinations for U. S. exports and leading sources of U.S. imports of information-intensive services is also included in this section. Section 5 includes our concluding remarks.

2 An Overview of Trade in Services

2.1 A Brief History

Historically, little attention has been paid to trade in services. One of the defining characteristics of services (*vis-à-vis* goods) is that they are co-produced by producers and consumers.¹ Thus, in the past when communication technologies were not well developed, the production of services required physical presence of both producers and consumers in the same location. Therefore, it was almost inconceivable that services could be traded. In fact, services were largely considered as non-tradable. Furthermore, agriculture and then manufacturing were the predominant sectors of the economy. Many services were just activities auxiliary to the production of goods and many others were simply not marketed. Consequently, even the General Agreement on Trade and Tariff (GATT), which was the forum for multilateral trade negotiations, was almost entirely about merchandise trade.

The services that accompany the movements of goods and people across borders were perhaps the first services in human history to be traded across borders. Thus, transportation was among the earliest to be traded. Several major breakthroughs during the 19th and the early 20th century, such as the invention of locomotive, opening of the Suez Canal and the Panama Canal, beginning of aviation, reduced the cost of freight and passenger transportation. As a result, although there was a

¹ For a discussion on the defining characteristics of services *vis-à-vis* goods, see Apte et al. (2008). Also, for a discussion on the characteristics of services that affect their tradability, see Lennon (2009)

surge in freight transportation, it was only after the World War II that further improvements in aviation technology made passenger travel more comfortable and inexpensive and travel became a major service that is traded across borders. Another important development that later contributed to services trade is the invention of telegraph and telephone. By eliminating the requirement of physical presence of producers and consumers in the same location, telecommunication technologies fundamentally changed the nature of service delivery and, in recent times, have gone a long way in promoting trade in information-intensive services.

Countries started recognizing the importance of services trade only in recent times. With the deregulation of its airline industry in the late 1970s, the U.S. started negotiating the open sky deals with many countries around the world. Further, increasing presence of American banks and entertainment industries overseas made the U.S. recognize its comparative advantage in services and the potential for trade in services with other countries. On the other side of the Atlantic Ocean, the European Common Market (ECM) also recognized the importance of services trade among the member states as well as with the rest of the world.² ICT advances provided further impetus for growth in services trade. The extensive use of ICT has made many services tradable across borders.³ In the United States, a structural shift of the economy towards information services increased the supply of and demand for such services.⁴ As we will see below, trade in information-intensive services account for more than three-fifths of total U.S. trade in private services today.

2.2 GATS and A Framework for Services Trade

The recognition of the importance and viability of services trade led the U.S. to make some concerted efforts to bring trade in services into the realm of multilateral trade negotiations. Primarily due to this effort, the General Agreement on Trade in Services (GATS) came into effect on January 1, 1995. GATS and the erstwhile GATT are now the two pillars of the World Trade Organization (WTO). Since, unlike merchandise trade, services trade needs to encompass a wide range of international transactions, the GATS takes a broad view of trade in services. Thus, the definition of trade in services that GATS uses includes four categories of transactions:

² See White (2007) for a discussion.

³ It has now been recognized that “International trade and investment in services are an increasingly important part of global commerce. Advances in information and telecommunication technologies have expanded the scope of services that can be traded cross-border.....trade and foreign direct investment (FDI) in services have grown faster than in goods over the past decade and a half.” Mattoo et al. (2008)

⁴ According to Apte et al. (2012), information services accounted for about 55 per cent of U.S. GNP in 2007.

- a) Cross-border trade: This category includes services supplied across borders. Examples include electricity, telecommunications, and transportation.
- b) Consumption abroad: It includes services supplied in a country to the foreigners. Tourism and education abroad are two examples.
- c) Commercial presence: The services supplied in a country by foreign business establishments are included in this category. Examples include restaurant chains, hotel chains etc.
- d) Presence of natural persons: This category includes services supplied in a country by foreign nationals. For example, services provided by visiting entertainers are included in this category.

Recently, the statistical agencies in the U.S. and other countries have tried to be consistent with this definition while collecting data on services trade.⁵

2.3 Current Trends in Services Trade

In this subsection, we discuss the major trends in services trade across the globe as well as in the U.S. The main sources of data for our analysis are: the *International Trade and Tariff Data* of the World Trade Organization (WTO) and the *International Economic Accounts* of the Bureau of Economic Analysis (BEA). The data are publicly available from the websites of these two organizations: <http://www.wto.org/> and <http://www.bea.gov/> respectively. We use annual data between 1980 and 2010, mainly due to the fact that services trade gained some prominence only in the 1980s.⁶

2.3.1 World Trade in Services

As we see from Table 1, total trade in private commercial services accounted for about 6 per cent of world GDP in 2010. Over a period of three decades, this ratio increased from slightly over 3 per cent in 1980. In contrast, the share of merchandise trade in world GDP increased from about 19 per cent in 1980 to 24 per cent in 2010. Services trade as a percentage of total trade increased from about 15 per cent to about 19 per cent during this period. It implies that trade in services grew faster than that in goods. While the value of merchandise trade increased 7 times, the value of services trade increased almost 10 times during this period of three decades.

⁵ For a discussion on the efforts made by the Bureau of Economic Analysis (BEA), see Koncz-Bruner and Flatness (2010).

⁶ For some detailed analysis in the following section, we use shorter sample periods, depending on the data availability.

[Insert Table 1]

Panel A of Table 2 lists 10 leading exporters and 10 leading importers of services in 2009. Note that the U.S. is the leader in both exports and imports of services, accounting for about 14 and 11 percent of services exports and imports respectively. Unlike in goods trade, the U.S. had a surplus in services trade in 2009. Except for China, all the leading exporters and importers of services are developed countries. Among the leaders, Germany, China, Japan, and Italy have been net importers of services.

[Insert Table 2]

To contrast with services trade, Panel B of Table 2 lists 10 leading exporters and 10 leading importers of goods in 2009. While China is the largest exporter accounting for about 10 per cent of total exports of good, the United States is the largest importer accounting for about 13 per cent of total imports in the world. Among the leaders, China is the only developing country. Further, three countries, namely the U.S., U.K., and Italy have had deficits in goods trade with the rest of the world.

2.3.2 U.S. Trade in Services

Table 3 presents an overall account of U.S. trade in services and goods relative to GDP in 1980 and 2010. While the dollar value of merchandise trade (both exports and imports) increased about 7 times from less than half a trillion USD to more than 3 trillion, the dollar value of services trade increased almost 10 times from barely USD 100 billion to about one trillion during this period. In 2010, services trade accounted for about 7 per cent of U.S. GDP while merchandise trade accounted for about 22 per cent. Thus, U.S. goods trade is more than 3 times larger than services trade. As one can see from the last column of Table 3, the value of both goods and services trade has been growing faster than nominal GDP. Further, services trade has been growing faster than merchandise trade.

[Insert Table 3]

In Figure 1, we plot the annual dollar value of trade balances (exports *minus* imports) for both goods and services in the United States between 1980 and 2010. We make the following observations. *First*, while the U.S. has been a net importer of goods, it has been a net exporter of services throughout the sample period. In 2010, the U.S. ran a deficit of about USD 700 billion in

merchandise trade. In contrast, it had a surplus of more than USD 150 billion in services trade. *Second*, as merchandise trade deficit grew significantly over the years, so did services trade surplus. There was a steady rapid increase in services trade surplus between 1985 and 1997 and then a steady decline between 1997 and 2003 before the surplus started rising rapidly again. In contrast, deficit in merchandise trade steadily increased between 1991 and 2006, except for a slight decline between 2000 and 2001. By 2005, merchandise trade deficit surpassed USD 800 billion and it stayed there for next three years before it fell drastically to about USD 500 billion in 2009. Although the deficit in goods trade increased in 2010, it did not reach the 2005-2008 level. *Third*, while merchandise trade balance seems to have been sensitive to business cycle fluctuations, balance in services trade seems to have been impervious to such fluctuations. For example, the steady increase in services trade surplus between 1985-1997 was not affected by the recession of the early 1990s. Similarly, the decline in services trade surplus during 2001 recessionary cycle seems to be more of a part of the declining trend between 1997 and 2003 rather than an effect of economic slowdown of 2001. Furthermore, the drop in 2009 was very moderate.

[Insert Figure 1]

We further examine the patterns in services trade by looking at its share in total trade. In Figure 2, we present the share of services in total trade and also the export and import shares of services separately. Trade in services accounted for about 17 percent of all trade in 1980. This share increased to about 24 percent in 1992 and then steadily decreased to about 20 percent in 2000, after which it slightly increased during 2000 – 2008, and significantly to about 25 percent in 2009. In 2010, trade share of services dropped to about 23 percent. The export and import shares of services followed very similar patterns although export shares have been much larger than import shares. The export share of services fluctuated between a minimum of 19.6 percent (in 1980) and a maximum of 32.7 percent (in 2009) while the import share fluctuated between 15.4 percent (in 1980) and 19.7 percent (in 1991).

[Insert Figure 2]

Another interesting observation is that the role of the multinational companies (MNCs) in services trade has become increasingly important. For example, the intra-industry or affiliated trade between MNCs and their affiliates accounted for 17 percent of total services trade in 1992 and this contribution rose to more than 27 percent in 2009. Figure 3 presents the share of affiliated trade in total services trade, and in services exports and imports separately. As we can see, exports of services

by the U.S. MNCs to their foreign affiliates and by the affiliates of foreign MNCs located in the U.S. to their parent companies in other countries increased from about 20 percent in 1992 to more than 28 percent in 2009. Similarly, imports from foreign MNCs or affiliates of U.S. MNCs located outside the U.S. increased from about 13 percent to about 26 percent during the same period. The increase in affiliated services trade also indicates an increase in foreign direct investment (FDI) in services by the U.S. MNCs abroad as well as by foreign MNCs in the U.S.

[Insert Figure 3]

Table 4 lists 10 leading destination countries for the U.S. service exports and 10 leading source countries for U.S. service imports in 2009. We make the following observations. *First*, the United Kingdom was not only the leading destination for U.S. service exports but also the leading source of U.S. service imports. It accounted for more than 10 percent of U.S. service exports as well as U.S. service imports. However, the value of exports was much larger than that of imports, thus resulting in a trade surplus for the U.S. *Second*, 10 leading destination countries accounted for more than 55 per cent of total U.S. service exports in 2009. Similarly, 10 leading source countries accounted for almost two-thirds of total service imports into the U.S. *Third*, although most countries within these two groups were developed countries, it is interesting to note that emerging market economies like Mexico, China, and Brazil were among the leading destinations and Mexico and India were among the leading sources of service imports. While geographic proximity may have played a central role in case of Mexico, rapid economic growth may have been the major driver for others.

[Insert Table 4]

We further examine the partners of the U.S. services trade according to the size of their bilateral trade balances. Table 5 includes 5 countries with which the U.S. had trade surpluses and 5 countries with which it had trade deficits in 2009. The countries are ordered according to the size of trade surplus or deficit. The U.S. had the largest surplus in services trade with Japan, followed by Canada, Ireland, the U.K., and Mexico. These five countries account for about half of the total surplus in services trade for the U.S. In contrast, the U.S. had the largest trade deficit with Bermuda, a British overseas territory in the North Atlantic Ocean, which is the major exporter of insurance to the U.S. Among others, the U.S. had a services trade deficit of USD 2.44 billion with India in 2009. Trade deficits with other countries are relatively small.

[Insert Table 5]

In Figure 4(a) & (b), we present respectively the export and import shares of five major categories of private services during 1992 – 2009.⁷ These categories are: travel, passenger fares, other transportation, royalties and license fees, and other private services. Note that the BEA provides services trade data by seven major categories that include, in addition to the five categories above, transfer under U.S. military sales contracts, and U.S. government miscellaneous services. As one can see from the figures, the category that experienced the highest growth in both export share and import share is “other private services”. For example, the export share of “other private services” (in total exports of private services) increased from about 31 percent in 1992 to about 49 percent in 2009 while the import share increased from about 25 per cent to about 50 percent during the same time period. In contrast, travel services, which used to be the largest category with more than 30 per cent of both exports and imports of services in 1992 declined in terms of its shares and accounted for only about 20 per cent in 2009. Note that “passenger fares” and “other transportation” are two sub-categories within travel services and both declined in their shares in total exports and imports of private services. Lower cost of travel may be partially responsible for these declines. The remaining major category of private services, namely “royalties and license fees”, experienced growth during this period. For example, its export share increased from about 13 percent in 1992 to about 19 percent in 2009. The import share also increased from about 5 percent to about 8 percent during this period.

[Insert Figure 4 (a) & (b)]

This discussion clearly shows that trade in two major categories of services, “other private services” and “royalties and license fees”, is the largest and the fastest growing segment of services trade in the U.S. As we will see in Section 4, the services included within these two broad categories are primarily information-intensive services. Before we present a detailed empirical analysis of trade in these services, we would like to discuss some of the intuitively plausible explanations for the rise of trade in information-intensive services.

⁷ The data on services trade have been highly aggregated. Disaggregated data by detailed categories of services are available only for recent years.

3 Rise of Trade in Information-Intensive Services: Some Intuitively Plausible Explanations

In this section, we will discuss, without formalizing, some of the intuitively plausible explanations for the growth of cross-border trade in information intensive services in the U.S. as well as in the rest of the world

First and foremost, the unprecedented advances in ICT have played (and will play) a pivotal role in the expansion of trade in information-intensive services. In fact, according to some studies, ICT advances contributed positively to the growth of trade in goods as well as in services.⁸ There are direct and indirect channels through which ICT advances can stimulate trade in information-intensive services. The most direct way is by lowering the cost of communicating information or transferring data. The low cost not only helps with the actual delivery of the service but also with the entry into the market in another country. Further, there are indirect channels through which ICT contributes to the growth of trade in information-intensive services. For example, ICT-enabled service innovations such as geographically dispersed production of service components (of which service outsourcing is an example) and assembly have tremendous implications for services trade.⁹ As Apte and Mason (1995) argue, the information-intensive services are most susceptible to such service disaggregation and international trade.¹⁰ They propose a four-way classification of activities within a service process: informational actions, customer contact actions, material manipulation actions, and other indirect actions. Analyzing various services based on relative time allocated to these four actions, they hypothesize that services in which most time is spent on informational actions (called information-intensive services) with low need for physical presence and customer contact and with separable symbolic manipulation are most susceptible to globalization and, therefore, to international trade.

⁸ Using bilateral trade data between the U.S. and 31 other countries, Freund and Weinhold (2002) show that the Internet penetration in foreign countries has a positive impact on services trade. Freund and Weinhold (2004) further show that use of the Internet also contributes positively to the growth of merchandise trade. They argue that the Internet stimulates exports by lowering the costs of entering the market. However, using data for a sample of 98 countries that include both developed and developing countries, Clarke and Wallsten (2006) find that Internet penetration has a significant positive effect only on exports from developing to the developed countries and not on exports to developing or from developed to other developed and developing countries.

⁹These innovations are a major part of the fundamental changes in services, collectively known as service industrialization. For a discussion, see Karmarkar (2010)

¹⁰ Mithas and Whitakar (2007) empirically show that information-intensive services have in fact been disaggregated globally.

Second, the fact that there has been an important structural shift towards information services in the U.S. economy is also responsible for the increase in information-intensive services trade. According to Apte et al (2012), information services accounted for about 55 percent of U.S. GNP in 2007. That means, 55 cents out of every dollar spent go to information-intensive services. Thus, the U.S. is not only the largest producer of information services but also the largest consumer of information services. Further, as living standards in other countries improve, demand for services in general and information services in particular in those countries increase. That also increases demand for tradable services produced in the United States. Some studies (for example, Kimura and Lee 2006 and Co 2007) present evidence to show that standard of living, measured by per capita income, in the trading partner countries has significant positive effect on the flow of trade in information-intensive services.

Third, the economic size and growth of the trading partners also matter for trade in services in general and information-intensive services in particular (Freund and Weinhold 2002; Kimura and Lee 2006; and Co 2007).¹¹ The range and complexity of economic activities in those economies create vast demand for a number of information-intensive services. To understand this potential for demand creation, we use the illustration from Quinn (1992) that shows how the size and growth of manufacturing can create demand for a host of services. As we can see in Figure 5, manufacturing is directly supported by value-added services like financing, leasing, and insurance; business services like consulting, auditing, and advertising; and distribution services like wholesaling, retailing, and repairing. These support services are further backed by infrastructure services, government services, and personal services. Many of these support services, particularly the information-intensive services, can be traded across borders.

[Insert Figure 5]

Fourth, the deregulation of service industries home and abroad and liberalization of foreign trade and investment regimes in many countries around the world also provide the impetus for growth in services trade. Service industries are heavily regulated and, therefore, it is often very difficult to attract foreign investment and trade. Recognizing the enhanced tradability of services due to technology, many governments around the world (including governments in many emerging market economies) have deregulated a number of information-intensive services primarily to increase competition and gain efficiency. Being in the forefront of technological advances, the U.S., in fact,

¹¹ Freund and Weinhold (2002) also find evidence of a positive impact of growth on services trade.

has already reaped the benefits by investing and trading in services with those countries. FDI also helps increase trade in services primarily through affiliated trade.¹²

Finally, unlike in merchandise trade, language and culture are very important in services trade. As Apte and Karmarkar (2010) argue, for consumer services which are information intensive, the topography of the world trade and outsourcing will be strongly colored by language, culture, and colonial history. In fact, the defining feature of this topography is language and not mountains and oceans, and the language barrier may well be the hard thing to cross. Figure 6 presents the distribution of world population for 5 major languages into different income ranges, measured by GNP per capita. It shows that the world English market for services is unique in its size, geographic distribution and, most importantly, in potential for trade. It is also one of the most open market. Spanish shares some of these features, but the distribution being less extreme offers less opportunity for those in poorer countries. For other major language groups concentrated in one or a few countries, the potential for outsourcing and international trade would be rather limited. This might well prove to be a boon for those engaged in services in those countries, since they will not be subject to the intense competition seen due to outsourcing and offshoring in the English and perhaps the Spanish worlds.

[Insert Figure 6]

Having discussed these factors that would potentially have an impact on the patterns of international trade in information-intensive services, we now turn to an analysis of the trends and patterns in U.S. trade in such services.

4 U.S. Trade in Information-Intensive Services

This section will focus entirely on the analysis of the U.S. trade in information-intensive services. Going by the definition that we discussed in the introduction, we may categorize “royalties and license fees” as an information-intensive service.¹³ The detailed sub-categories within this item are: industrial processes; books, records, and tapes; broadcasting and recording of live events; franchise fees; trademarks; general use computer software; and other intangibles. Thus, exports of “royalties and license fees” refer to royalties and license fees received by the U.S. for the use of the intangible items listed above in foreign countries. Similarly, imports refer to such payments by the U.S. for the use of these intangible items developed produced in foreign countries.

¹² Mann and Civril (2008) provide evidence in support of this.

¹³ This category has been referred to as knowledge-intensive services in Co (2007)

Furthermore, the services included in the category “other private services” are primarily information-intensive services.¹⁴ The BEA broadly divides this category into education; financial services; insurance; telecommunications; business, professional, and technical services; and a residual category called others. The category “business, professional, and technical services” is further subdivided into advertising; computer and data processing; database and other information services; research, development and testing services; management, consulting, and public relations services; legal services; construction, engineering, architectural, and mining services; industrial engineering; installation, maintenance, and repair of equipment; and other business, professional, and technical services. Except for “construction, engineering, architectural, and mining services” and “installation, maintenance, and repair of equipment”, other categories are highly information-intensive. These two categories do not entirely involve creating, processing, and communicating information and require some physical activity.

As discussed in the Section 2, the export and import shares of these two major categories of information-intensive services: “royalties and license fees” and “other private services”, increased significantly between 1992 and 2009. They together accounted for about 68 percent of total private services exports from the U.S. in 2009. Similarly, the combined import share of “royalties and license fees” and “other private services” was about 58 per cent of total imports of private services in 2009.

[Insert Table 6]

Now let us first discuss how trade in these two categories of information-intensive services has changed by types of trade. In Table 6, we present a decomposition of trade by two types: affiliated (intra-industry) and unaffiliated for these two broad categories in 1992 and 2009. In general, we make the following observations. *First*, intra-industry trade accounted for about two-thirds of exports as well as imports of “royalties and license fees” but only one-third of exports and about two-fifths of imports of “other private services”. *Second*, within affiliated trade, the exports from the U.S. parent companies to their foreign affiliates were the largest component of intra-industry exports for both categories of services. In case of intra-industry imports, while the imports by the U.S. affiliates from their foreign parent companies were the largest component for “royalties and license fees”, it was the imports by U.S. parent companies from their foreign affiliates that were the largest for “other private services”.

¹⁴ Markusen (1989) modeled this category as capital-intensive service

We now look at the major trading partners of the U.S. in information-intensive services trade. Panel A of Table 7 lists 10 leading destination countries each for U.S. exports of “royalties and license fees” and “other private services” in 1992 and 2009. While Japan was the top destination for exports of “royalties and license fees” with more than 18 percent of the total U.S. receipts in this category in 1992, Ireland took this top spot in 2009 with more than 16 percent. Three countries that made to the top 10 list in 1992, Belgium-Luxembourg, Australia, and Spain, moved out of this list in 2009 while Ireland, Singapore, and the Republic of Korea joined the league of top 10.¹⁵ For the exports of “other private services”, the United Kingdom topped the list of leading destination countries in both 1992 and 2009, with about 11 and 13 per cent respectively. While the Netherlands, Singapore, Saudi Arabia, and Italy ceased to be among the top 10 in 2009, Ireland, China, Bermuda, and Switzerland joined the club.

[Insert Table 7]

While the United Kingdom was at the top of the list of leading source countries for U.S. imports of “royalties and license fees” in 1992 with about 25 per cent, Japan moved to the top spot in 2009 with about 23 per cent. Among the top 10 in 1992, Italy and Bermuda moved out of the list in 2009 and Ireland and Sweden joined the ranks. The United Kingdom remained the largest source country for imports of “other private services” both in 1992 and 2009 with about 17 percent and 15 percent respectively. Among the top 10 source countries for imports of this category of services, Mexico and Italy slipped off the list and India and Ireland joined the league.

[Insert Table 8]

We now examine more disaggregated data. However, total trade data for the detailed sub-categories under “royalties and license fees” are available only since 2006. Table 8 presents the percentage shares of seven different sub-categories in total export and import values of “royalties and license fees” for four years between 2006 and 2009. Note that data are available only for unaffiliated trade before 2006 and, therefore, they are not comparable with the figures since 2006. As one can see from the table, two major items, industrial processes and general use computer software, together accounted for about 80 percent of total exports of “royalties and license fees” and more than 80 percent of total imports into the U.S. While the share of “industrial processes”

¹⁵ Although Belgium and Luxembourg are two different countries services trade data are reported together.

declined, that of “general use computer software” increased during this four year period. Overall, the total export value of this broad category is more than 3 times higher than its import value.

[Insert Figure 7 (a) & (b)]

Figure 7(a) and (b) present the shares of major sub-categories of services under “other private services” in total services exports and imports respectively. Note that for “financial services” and “business, professional and technical services”, data are available only since 1997. Among the export categories, “business, professional, and technical services” and “financial services” are the two largest sub-categories with about 24 and 12 percent of total private services exports from the U.S. Their share rose from about 18 and 5 percent respectively in 1997. While during the recent financial crisis the share of “financial services” dropped since its peak in 2007, the exports of “business, professional and technical services” continued to grow. Among the services imports, the share of “business, professional and technical services” grew from less than 15 per cent in 1997 to about 25 per cent. The other service that experienced significant growth in its share, particularly since 2000, is insurance. In 2000, imports of insurance accounted for about 5 percent of total private services imports into the U.S. It grew to about 15 per cent in 2009. Bermuda is the largest exporter of insurance to the U.S.

[Insert Table 9]

To shed further lights, we will now examine a few detailed sub-categories within “business, professional, and technical services”. Table 9 presents the percentage shares of 10 different sub-categories in total export and import values of “business, professional and technical services” for four years between 2006 and 2009. “Management consulting and public relations services” was the largest sub-category accounting for about one quarter of total exports and more than one-quarter of total imports under the broad category. This is followed by “research, development, and testing services” with about 15 per cent of exports and more than 15 per cent of imports. The import share also increased over time.

Overall, dramatic increases in export and import shares of financial services and insurance seem to reflect greater global financial integration through the use of ICT. Further, more than doubling in the import share of “computer and information services” may be a reflection of offshore outsourcing of these services. Further, a significant decline in the import share of telecommunications may be an indication of a substantial cost reduction in providing these services due to technological advances.

5 Concluding Remarks

This paper examines the recent trends and patterns of U.S. trade in information-intensive services. Based on evidence since the early 1990s, this paper concludes that trade in such services is not only the largest segment of overall trade in services but also the one that has grown the fastest over the last two decades. Although, being in the forefront of ICT advances has rendered the comparative advantage in information-intensive services to the U.S., there are other factors that may have contributed to this growth. As we speculate, a structural shift towards information services, high living standards, size and growth of manufacturing, regulations or deregulations, language and culture – all may have played a role in information-intensive services trade.

Moving forward, sustaining this comparative advantage in information-intensive services will be a major challenge for the United States. The increasing tradability of services and increased opportunities for developing countries in services trade pose the challenge of improving efficiency in the provision of services. Efficiency improvements are necessary not only to achieve comparative advantage in new trade opportunities, but also because access to efficient services will be an increasingly important determinant of competitiveness throughout the economy, reflecting the rising service intensity of production in general. The implications of these for education, employment, and trade policy in the U.S. are immense. Furthermore, adopting a liberal trade and investment regime will be essential for countries to maximize benefits from the internationalization of services. The GATS marks a major achievement in establishing a framework for multilateral trade liberalization in services, but not much has been achieved so far.

References

- Amity, M. and S-J Wei. 2009. "Service Offshoring and Productivity: Evidence from the US." *The World Economy*, 203-220.
- Apte, U. M. and U. S. Karmarkar. 2007. "Business Process Outsourcing (BPO) and Globalization of Information Intensive Services," in U. M. Apte and U. S. Karmarkar (eds.), *Managing in the Information Economy: Current Research Issues*, Springer Science + Business + Media, New York, NY, pp. 59-81.
- Apte, U. M., U.S. Karmarkar, and H.K. Nath. 2008. "Information Services in the U.S. Economy: Value, Jobs, and Management Implications." *California Management Review*, Vol. 50, No. 3, 12-30.
- Apte, U. M., U.S. Karmarkar, and H.K. Nath. 2012. "The Information Economy: Value, Employment, Structure and Trade." *Foundations and Trends® in Technology, Information and OM*, forthcoming.
- Apte, U. M. and R. O. Mason. 1995. "Global Disaggregation of Information-Intensive Services." *Management Science*, Vol. 41, No. 7: 1250-1262
- Bhagwati, J. N. 1987. "Trade in Services and the Multilateral Trade Negotiations." *World Bank Economic Review*, 1(4), 549-69.
- Bureau of Economic Analysis (BEA). *International Economic Accounts* (<http://www.bea.gov/>). Data downloaded in September, 2011.
- Clarke, G. R. G. and S. J. Wallsten. 2006. "Has the Internet increased trade? Developed and developing country evidence." *Economic Inquiry*, Vol. 44, No. 3, 465-484.
- Co, C. Y. 2007. "US Exports of Knowledge-intensive Services and Importing-country Characteristics." *Review of International Economics*, 15 (5), 890-904.
- Deardorff, A. V. 2001. "International Provision of Trade Services, Trade, and Fragmentation." *Review of International Economics*, 9(2), 233-48.
- Deardorff, A.V. and R. M. Stern. 2008. "Empirical Analysis of Barriers to International Services Transactions and the Consequences of Liberalization." In Mattoo, A., R. M. Stern, and G. Zanini (eds). *A Handbook of International Trade in Services*. Oxford, UK: Oxford University Press.
- Francois, J. and B. Hoekman. 2010. "Services Trade and Policy." *Journal of Economic Literature* 48 (3), 642-692.
- Freund, C. and D. Weinhold. 2002. "The Internet and International Trade in Services." *American Economic Review* (Papers and Proceedings), 92:2, 236 – 240.
- Freund, C. and D. Weinhold. 2004. "The effect of the Internet on international trade." *Journal of International Economics* 62, 171-189.
- Grunfeld, L. A. and A. Moxnes. 2003. "The Intangible Globalization: Explaining the Patterns of International Trade in Services." *Norwegian Institute of International Affairs Working Paper* 657.

- Hoekman, B. 1996. "Assessing the General Agreement on Trade in Services." In Martin, W and L. A. Winters (eds.) *The Uruguay Round and the Developing Countries*. Cambridge, New York, and Melbourne: Cambridge University Press.
- Hoekman, B. and A. Mattoo. 2008. "Services Trade and Growth." In Marchetti, J. A. and M. Roy (eds.) *Opening Markets for Trade in Services: Countries and Sectors in Bilateral and WTO Negotiations*. Cambridge and New York: Cambridge University Press.
- Hoekman, B., A. Mattoo, and A. Sapir. "The Political Economy of Services Trade Liberalization: A Case for International Regulatory Cooperation?" *Oxford Review of Economic Policy* 23(3): 367 -91.
- Karmarkar, U. S. 2010. "The Industrialization of Information Services." In Maglio, P. P., C. A. Kieliszewski, and J. C. Spohrer (eds.) *Handbook of Service Science*. Springer: 419-435.
- Kimura, F. and H. Lee. "The Gravity Equation in International Trade in Services." *Review of World Economics*, Vol. 142 (1), 92- 121.
- Koncz-Bruner, J. and A. Flatness. 2010. "U.S. International Services Cross-Border Trade in 2009 and Services Supplied Through Affiliates in 2008." *Survey of Current Business*, October: 18-35.
- Lennon, C. 2009. "Trade in Services and Trade in Goods: Differences and Complementarities." *The Vienna Institute for International Economic Studies Working Papers* 53.
- Mann, C. L. and D. Civril. 2008. "U.S. International Trade in Other Private Services: Do Arm's Length and Intra-Company Trade Differ?" *Mimeo*, Brandeis Business School, Brandeis University.
- Markusen, J. 1989. "Trade in producer services and in other specialized intermediate inputs." *American Economic Review*, 79(1), 85 – 95.
- Mattoo, A, R. Rathindran, and A. Subramanian. 2006. "Measuring Services Trade Liberalization and Its Impact on Economic Growth: An Illustration." *Journal of Economic Integration* 21(1), 64-98.
- Mattoo, A., R. M. Stern, and G. Zanini. 2008. *A Handbook of International Trade in Services*. Oxford, UK: Oxford University Press.
- Mithas, S. and J. Whitaker. 2007. "Is the World Flat or Spiky? Information Intensity, Skills, and Global Service Disaggregation." *Information Systems Research*, Vol. 18: 237-259.
- Polese, M. and R. Verreault. 1989. "Trade in Information-Intensive Services: How and Why Regions Develop Export Advantages." *Canadian Public Policy* XV:4, 376-386.
- Quinn, J. B. (1992), *Intelligent Enterprise: A Knowledge and Service Based Paradigm for Industry*, The Free Press, a Division of McMillan, Inc.
- White, LJ (2007). Reducing Barriers to Services Trade: The U.S. Case. In *Sleeping Giant: Awakening the Transatlantic Services Economy*, DS Hamilton and JP Quinlan (eds.). Washington, DC: Center for Transatlantic Relations.
- World Trade Organization (WTO). *International Trade and Tariff Data*. (<http://www.wto.org/>). Data downloaded in September 2011.

Table 1 World Trade in Services and Goods and GDP, 1980 and 2010

	1980		2010		Average annual growth rate (1980-2010)
	Value in billions of current USD	As percentage of world GDP	Value in billions of current USD	As percentage of world GDP	
Trade in commercial services	367	3.3%	3,664	5.8%	8.2%
Trade in goods	2,034	18.5%	15,238	24.2%	7.4%
GDP	10,988	100.0%	63,049	100.0%	6.1%

Note: Commercial services include private services and not government services

Source: World Trade Organization (WTO) and World Bank

Table 2 Leading Exporters and Importers Services and Goods, 2009

Rank	Exporters	Value in billions of current USD	% share in total world exports	Rank	Importers	Value in billions of current USD	% share in total world imports
Panel A: Trade in Services							
1	United States	474	14.1	1	United States	331	10.5
2	United Kingdom	233	7.0	2	Germany	253	8.1
3	Germany	227	6.8	3	United Kingdom	161	5.1
4	France	143	4.3	4	China	158	5.0
5	China	129	3.8	5	Japan	147	4.7
6	Japan	126	3.8	6	France	126	4.0
7	Spain	122	3.6	7	Italy	115	3.6
8	Italy	101	3.0	8	Ireland	103	3.3
9	Ireland	97	2.9	9	Spain	87	2.8
10	Netherlands	91	2.7	10	Netherlands	85	2.7
Panel B: Trade in Goods							
1	China	1202	9.6	1	United States	1605	12.7
2	Germany	1126	9.0	2	China	1006	7.9
3	United States	1056	8.5	3	Germany	938	7.4
4	Japan	581	4.6	4	France	560	4.4
5	Netherlands	498	4.0	5	Japan	552	4.4
6	France	485	3.9	6	United Kingdom	482	3.8
7	Italy	406	3.2	7	Netherlands	445	3.5
8	Belgium	370	3.0	8	Italy	413	3.3
9	Republic of Korea	364	2.9	9	Hong Kong, China	352	2.8
10	United Kingdom	352	2.8	10	Belgium	352	2.8

Source: Based on data from WTO

Table 3 U.S. Trade in Services and Goods and GDP, 1980 and 2010

	1980		2010		Average annual growth rate (1980 -2010)
	Value in billions of current USD	As a percentage of GDP	Value in billions of current USD	As a percentage of GDP	
Trade in services	100	3.6%	965	6.6%	8.0%
Trade in goods	474	17.0%	3,227	22.0%	7.0%
GDP	2,788	100.0%	14,660	100.0%	5.7%

Note: Services include both private and government services. Growth rates represent growth in nominal value.

Source: Based on data from Table 1.1.5 of BEA's National Economic Accounts

Table 4 Leading Destination Countries for U.S. Exports and Leading Source Countries for U.S. Imports of Private Services, 2009

Rank	Country	Value in billions of current USD	% share in total
Panel A: Leading Destination for U.S. Exports			
1	United Kingdom	51.0	10.6
2	Canada	42.0	8.7
3	Japan	40.9	8.5
4	Ireland	25.3	5.2
5	Germany	24.3	5.0
6	Mexico	21.8	4.5
7	Switzerland	17.5	3.6
8	France	16.3	3.4
9	China	15.7	3.2
10	Brazil	12.7	2.6
	All countries	483.9	100.0
Panel B: Leading Sources of U.S. Imports			
1	United Kingdom	38.1	11.4
2	Bermuda	23.6	7.1
3	Germany	22.7	6.8
4	Canada	22.0	6.6
5	Japan	20.8	6.2
6	Switzerland	18.0	5.4
7	Mexico	13.5	4.0
8	France	13.4	4.0
9	India	12.4	3.7
10	Ireland	10.0	3.0
	All countries	334.9	100.0

Source: Calculations based on data from Table 2 (Private Services Trade by Area and Country), Detailed Statistics for Cross-Border Trade under U.S. International Services, BEA

Table 5 U.S. Trade Balances (Exports – Imports) in Private Services Trade with Selected Countries, 2009

Country	Trade balance in billions of current USD	% share in total trade balance
Countries with which U.S. has trade surplus		
Japan	20.10	13.49
Canada	19.99	13.42
Ireland	15.35	10.31
United Kingdom	12.94	8.69
Mexico	8.31	5.58
Countries with which U.S. has trade deficit		
Switzerland	-0.49	-0.33
Philippines	-0.65	-0.43
Hong Kong	-0.84	-0.56
India	-2.44	-1.64
Bermuda	-14.12	-9.48

Source: Calculations based on data from Table 2 (Private Services Trade by Area and Country), Detailed Statistics for Cross-Border Trade under U.S. International Services, BEA

Table 6 Affiliated and Unaffiliated Trade in Royalties and License Fees and Other Private Services
(Values in millions of current USD)

Description	Royalties and license fees		Other private services	
	1992	2009	1992	2009
Panel A: Exports				
Total	20,841 (100%)	89,791 (100%)	52,854 (100%)	238,332 (100%)
Affiliated	15,658 (75.1%)	58,817 (65.5%)	17,461 (33.0%)	78,172 (32.8%)
By U.S. parent companies to their foreign affiliates	14,925 (71.6%)	55,430 (61.7%)	11,117 (21.0%)	53,636 (22.5%)
By U.S. affiliates to their foreign parent companies	733 (3.5%)	3,387 (3.8%)	6,347 (12.0%)	24,536 (10.3%)
Unaffiliated	5,183 (24.9%)	30,974 (34.5%)	35,388 (67%)	160,159 (67.2%)
Panel B: Imports				
Total	5,161 (100%)	25,230 (100%)	25,462 (100%)	168,892 (100%)
Affiliated	3,396 (65.8%)	18,350 (72.7%)	9,640 (37.9%)	66,978 (39.7%)
By U.S. parent companies from their foreign affiliates	189 (3.7%)	4,508 (17.9%)	5,355 (21.0%)	46,687 (27.6%)
By U.S. affiliates from their foreign parent companies	3,207 (62.1%)	13,843 (54.9%)	4,285 (16.8%)	20,291 (12.0%)
Unaffiliated	1,766 (34.2%)	6,880 (27.3%)	15,816 (62.1%)	101,913 (60.3%)

Note: Percentage shares in total export and import values for the respective categories are in bracket

Source: Calculations based on data from Table 4 (Royalties and License Fees) and Table 5 (Other Private Services), Detailed Statistics for Cross-Border Trade under U.S. International Services, BEA

Table 7 Leading Destination and Source Countries for U.S. Exports and Imports of “Royalty and License Fees” and “Other Private Services”: 1992 and 2009

		Royalties and License Fees			Other Private Services				
		1992		2009		1992		2009	
Rank	Country	% share in total	Country	% share in total	Country	% share in total	Country	% share in total	
Panel A: Leading Destination Countries for U.S. Exports									
1	Japan	18.3	Ireland	16.1	United Kingdom	11.1	United Kingdom	12.9	
2	United Kingdom	10.3	Switzerland	9.0	Japan	9.9	Canada	7.3	
3	Germany	9.6	Japan	8.9	Canada	9.8	Japan	7.0	
4	France	8.8	Germany	6.9	Mexico	6.7	Mexico	4.5	
5	Canada	6.2	Canada	6.4	Germany	5.2	Germany	4.2	
6	Netherlands	5.9	United Kingdom	6.4	France	3.8	Ireland	3.9	
7	Belgium-Luxembourg	2.5	Singapore	4.6	Netherlands	2.3	China	3.4	
8	Switzerland	2.4	Republic of Korea	3.4	Singapore	2.1	France	3.3	
9	Australia	2.3	France	3.4	Saudi Arabia	2.1	Bermuda	3.2	
10	Spain	2.3	Netherlands	2.7	Italy	2.0	Switzerland	2.9	
Panel B: Leading Sources of U.S. Imports									
1	United Kingdom	24.7	Japan	22.7	United Kingdom	17.3	United Kingdom	14.9	
2	Japan	17.3	France	13.8	Japan	11.0	Bermuda	13.3	
3	Germany	9.6	Germany	13.2	Canada	10.4	Switzerland	7.7	
4	Switzerland	8.6	United Kingdom	10.3	Germany	7.5	Germany	6.9	
5	France	7.8	Switzerland	10.2	France	6.0	Canada	6.7	
6	Netherlands	7.1	Ireland	9.2	Bermuda	5.1	India	5.6	
7	Canada	1.6	Sweden	4.0	Mexico	4.3	Ireland	3.8	
8	Belgium-Luxembourg	1.1	Canada	2.8	Netherlands	3.2	Japan	3.4	
9	Italy	1.0	Netherlands	2.1	Switzerland	2.6	France	2.7	
10	Bermuda	0.2	Belgium-Luxembourg	2.1	Italy	2.4	Netherlands	2.4	

Source: Based on data from BEA

Source: Calculations based on data from Table 4 (Royalties and License Fees) and Table 5 (Other Private Services), Detailed Statistics for Cross-Border Trade under U.S. International Services, BEA

Table 8 Shares of Various Sub-categories in Total Exports and Imports of Royalties and License Fees, 2006 – 2009 (In percentages, unless and otherwise stated)

	Exports				Imports			
	2006	2007	2008	2009	2006	2007	2008	2009
Industrial processes	45.8	43.0	42.5	39.7	70.3	66.8	63.0	65.3
Books, records, and tapes	2.1	1.8	1.6	1.6	3.2	3.0	3.1	3.2
Broadcasting and recording of live events	0.6	0.7	0.6	0.7	4.3	0.8	3.9	0.9
Franchise fees	4.6	4.7	4.8	4.8	0.8	0.7	0.9	0.8
Trademarks	14.7	13.7	13.2	13.0	8.2	9.0	9.4	9.5
General use computer software	32.0	36.0	37.2	40.1	12.6	19.2	19.2	19.8
Other intangibles	0.1	0.1	0.1	0.1	0.5	0.4	0.7	0.5
Total value of trade in royalties and license fees (millions of current USD)	70,727	84,580	93,920	89,791	23,518	24,931	25,781	25,230

Source: Calculations based on data from Table 4 (Royalties and License Fees), Detailed Statistics for Cross-Border Trade under U.S. International Services, BEA

Table 9 Shares of Various Sub-categories in Total Exports and Imports of Business, Professional, Technical Services , 2006 – 2009 (In percentages, unless and otherwise stated)

	Exports				Imports			
	2006	2007	2008	2009	2006	2007	2008	2009
Advertising	4.37	3.94	3.57	3.40	3.07	3.07	2.67	2.85
Computer and data processing services	6.64	6.94	7.34	7.35	20.82	20.34	19.11	19.83
Database and other information services	5.03	4.58	4.25	4.12	0.95	1.12	1.24	1.12
Research and development	14.83	15.06	15.12	15.63	15.03	18.51	19.72	19.21
Management consulting and public relations services	24.80	26.18	25.25	24.17	30.09	27.65	27.08	27.14
Legal services	6.08	6.17	6.36	6.22	1.98	2.18	2.41	2.07
Construction engineering, architectural, and mining	6.30	5.78	6.17	5.82	2.26	2.15	2.30	2.19
Industrial engineering services	4.52	3.67	3.28	4.27	2.18	3.89	4.40	4.49
Installation, maintenance, and repairing services	8.88	8.44	8.24	9.59	7.43	7.40	7.15	7.52
Other business, professional, and technical services	11.40	12.39	13.70	12.80	14.53	12.37	12.80	12.26
Total value of trade in business, professional, and technical services (millions of current USD)	86,390	103,765	115,229	116,629	61,698	70,413	82,537	81,995

Source: Calculations based on data from Table 7 (Business, Professional, and Technical Services), Detailed Statistics for Cross-Border Trade under U.S. International Services, BEA

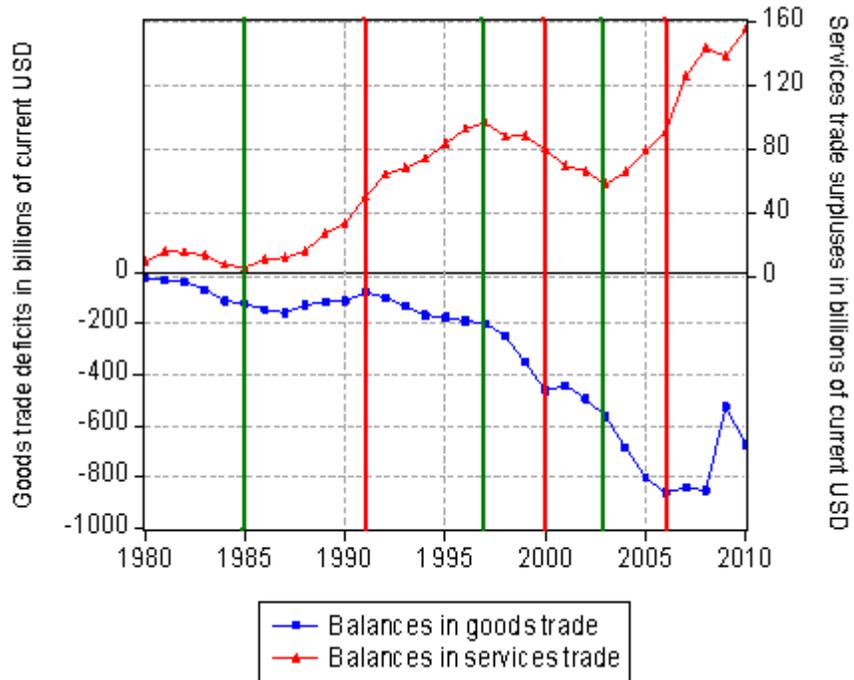


Figure 1 U.S. trade balances (exports – imports) in goods and services: 1980 – 2010

Note: Trade balances for goods and services are calculated using data from Table 1.1.5 of BEA’s National Economic Accounts. Services include both private and government services.

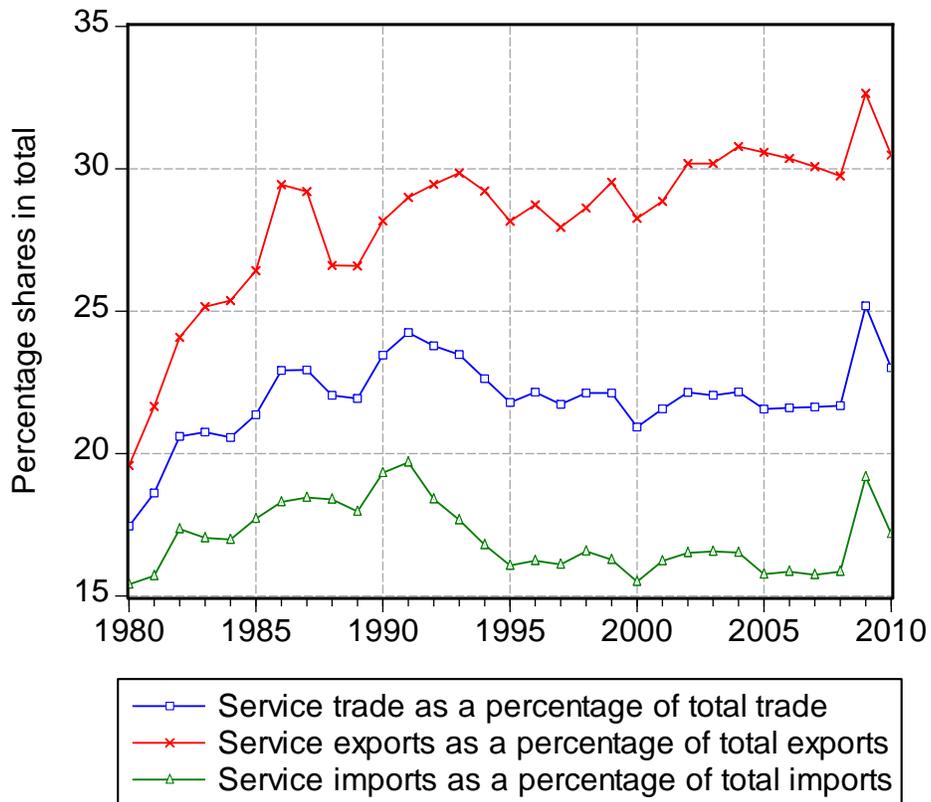


Figure 2 Trade shares of services trade, services exports, and services imports

Note: Shares of services trade, exports, and imports are calculated using data from Table 1.1.5 of BEA's National Economic Accounts. Services include both private and government services.

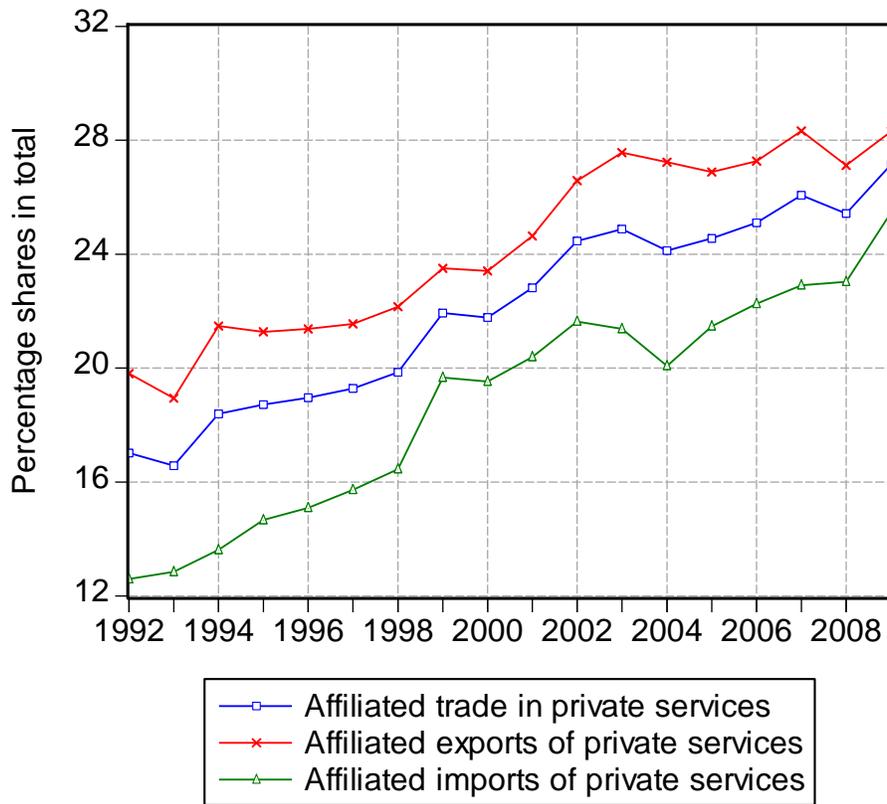


Figure 3 Affiliated trade shares in total trade, exports, and imports of private services in the U.S.

Note: Shares of affiliated trade, exports, and imports are calculated using data from Table 1 (Trade in Services), Detailed Statistics for Cross-Border Trade under U.S. International Services, BEA

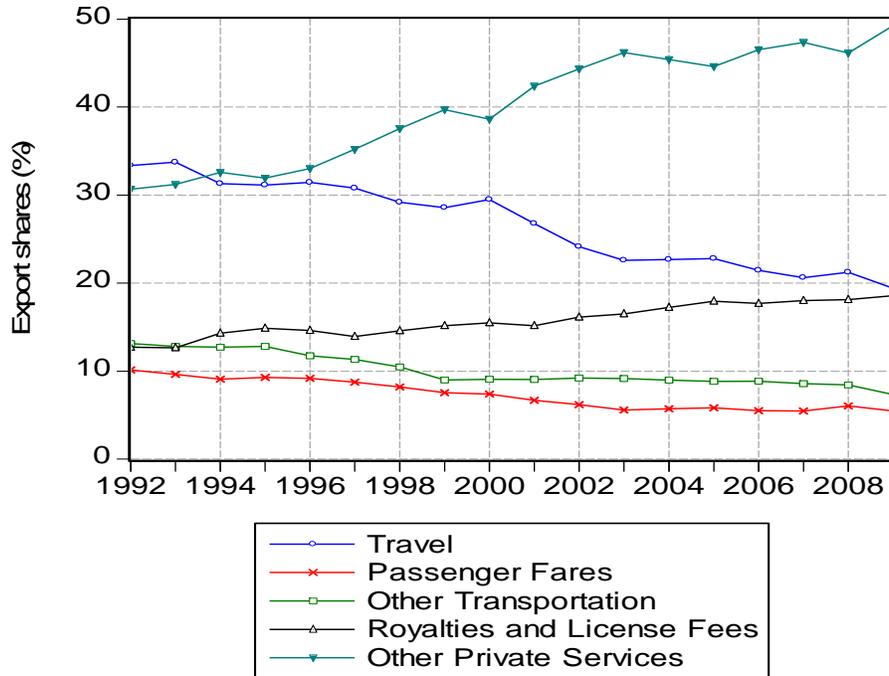


Figure 4 (a) Shares of 5 major categories of private services in total exports of private services from the U.S.

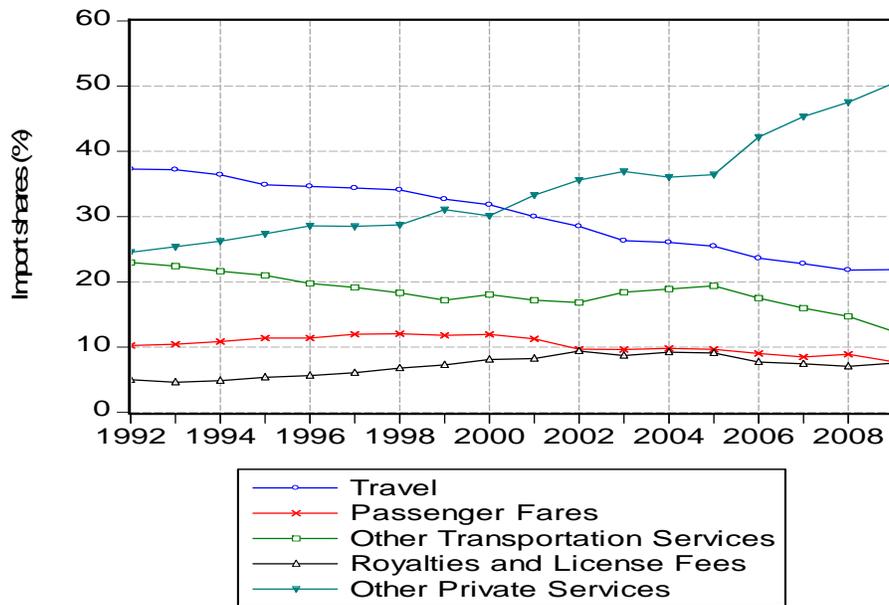


Figure 4 (b) Shares of 5 major categories of private services in total imports of private services into the U.S.

Note: Export and import shares of major categories of services are calculated using data from Table 1 (Trade in Services), Detailed Statistics for Cross-Border Trade under U.S. International Services, BEA

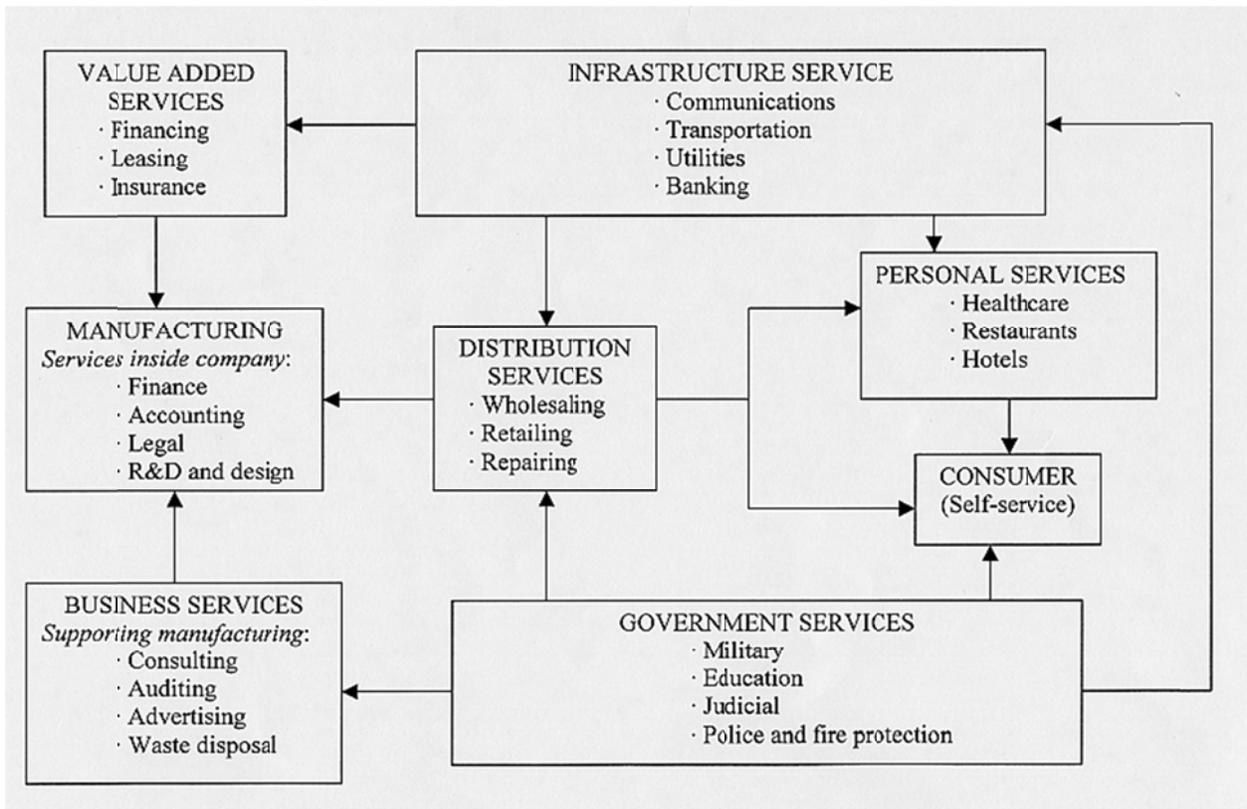


Figure 5 Interactive role of services (Quinn 1992)

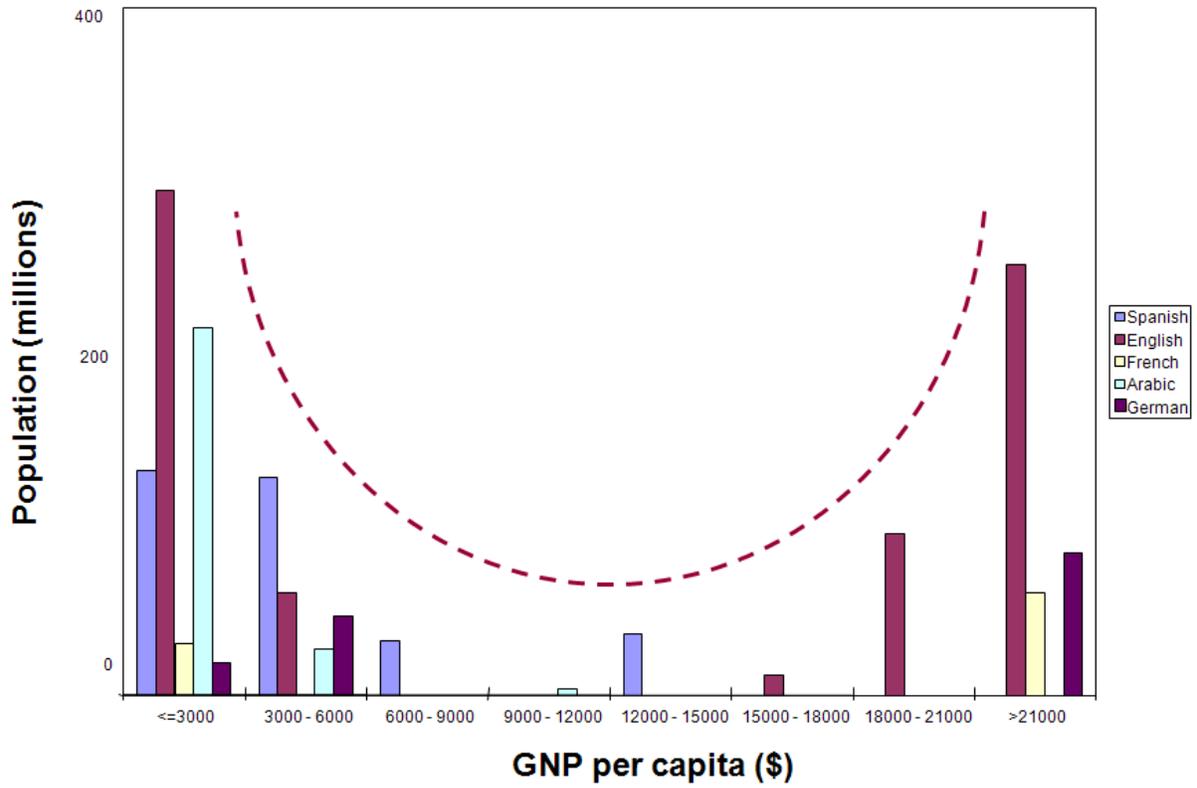


Figure 6 Distribution of different language speaking population by income (Modified from Apte and Karmarkar 2007)

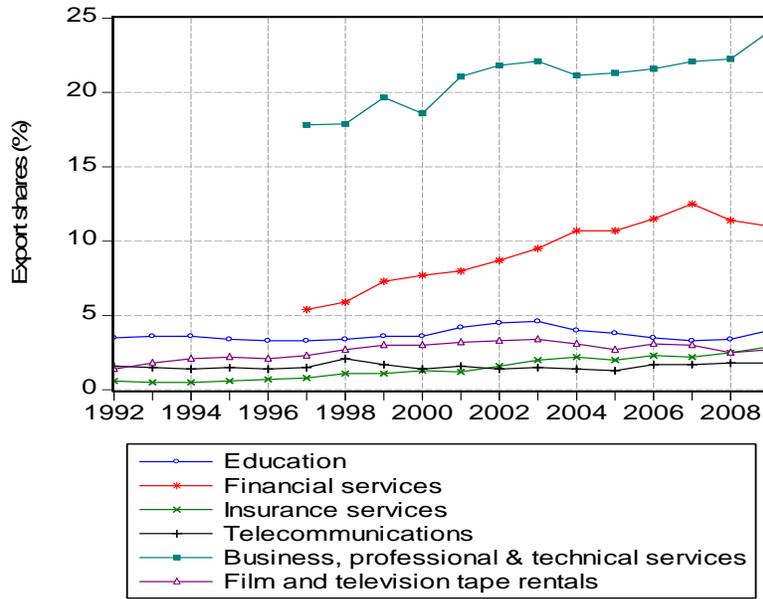


Figure 7 (a) Shares of 6 sub-categories of other private services in total exports of private services from the U.S.

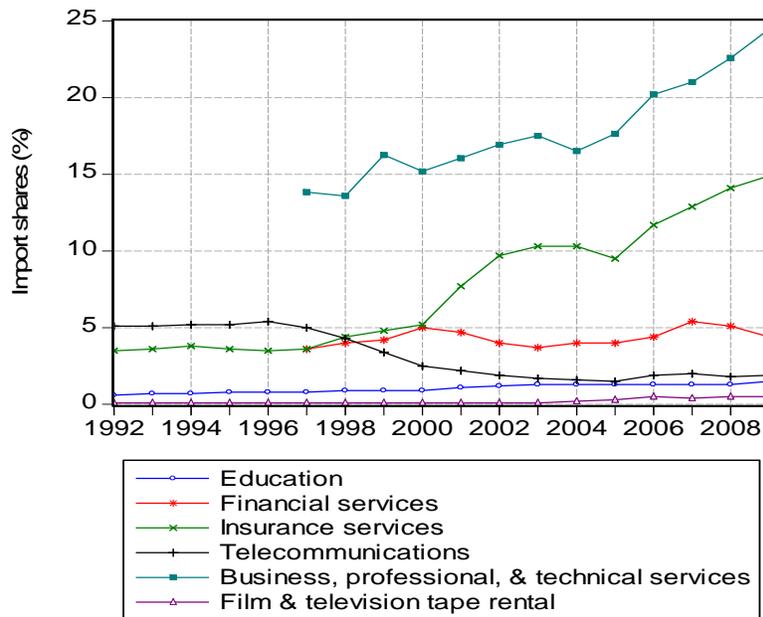


Figure 7 (b) Shares of 6 sub-categories of other private services in total imports of private services into the U.S.

Note: Export and import shares of major categories of services are calculated using data from Table 5 (Other Private Services), Detailed Statistics for Cross-Border Trade under U.S. International Services, BEA