



# ICT-Enabled Services Trade in the European Union

## Executive Summary

By  
Jessica R. Nicholson

In the past, as with goods, the provision of a service either required the physical delivery of information via traditional shipping options or required travel by the purchaser or provider. Now, businesses and consumers are increasingly using the Internet to purchase services. While most commodities must still be physically delivered, there are a number of services that can be delivered almost instantaneously online at a relatively small cost, not only domestically but across the globe.

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This report, which adds to prior work in the Office of the Chief Economist and the Bureau of Economic Analysis, provides estimates of international services trade in the European Union (EU) that has the *potential* to be delivered remotely over information and communication technology (ICT) networks—or that are *potentially* ICT-enabled services. These estimates of ICT-enabled trade underscore the importance these new forms of cross-border services may have to countries across the European Union and are important for understanding how restrictions on the flow of data across borders may impact countries' economies. It finds that in 2014:

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- The 28 EU member states collectively exported \$1.2 trillion and imported \$935.1 billion in ICT-enabled services, to countries both inside of and outside of the EU.
- Excluding intra-EU trade, EU member states exported \$569.6 billion and imported \$418.0 billion in ICT-enabled services, resulting in a surplus of \$151.6 billion for these services. ICT-enabled services trade represented 56 percent of all services exports to non-EU countries and 52 percent of all services imports from non-EU countries.
- The largest shares of all EU ICT-enabled services exports and imports, and in trade of these services with non-EU countries, were in “selected other business services” which includes: research and development services (R&D); professional, management, and consulting services; architectural, engineering, scientific and other technical services; and other business services not included elsewhere.



- The EU member states with the largest estimated value of ICT-enabled services exports were the United Kingdom (UK) (\$159.0 billion), Germany (\$149.2 billion), France (\$128.0 billion), and the Netherlands (\$115.3 billion).
- Some member states, like the UK, the Netherlands, and Sweden transmitted more than half of their ICT-enabled services exports to destinations outside of the EU. Other member states, like Poland, Austria, and Belgium, were more likely to export to other EU member states.
- The largest non-EU consumer of EU ICT-enabled services exports was the United States, which purchased 16 percent, or \$179.9 billion, of total EU exports of these services.<sup>1</sup>
- The United States exported approximately \$147.6 billion in ICT-enabled services to EU member states.

## Introduction

In the past, as with goods, the provision of a service either required the physical delivery of information via traditional shipping options or required travel by the purchaser or provider. Now, while many goods can be purchased via the Internet, most commodities must still be physically delivered to a customer. At the same time, businesses and consumers are increasingly using the Internet to purchase services and there are a number of services that can be delivered almost instantaneously online at a relatively small cost, not only domestically but across the globe.

Measuring the magnitudes of the trade in these “ICT-enabled services” presents many challenges.<sup>2</sup> However, trade negotiators and other policy makers need to understand the importance of trade in these services to help make informed decisions about data policy. While recent reports by the Bureau of Economic Analysis (BEA)<sup>3</sup> and the Department of Commerce’s (Commerce) Office of the Chief Economist (OCE)<sup>4</sup> provided estimates of the importance of

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<sup>1</sup> This value is calculated using export data compiled by the Organisation for Economic Cooperation and Development (OECD) from national statistical agencies of European Union member countries and differs from estimates calculated using import data available from the Bureau of Economic Analysis. See box on Data Limitations for more information.

<sup>2</sup> Recently, Commerce has been working with data users to improve the data available to measure aspects of the digital economy, including ICT-enabled services trade. Commerce’s Office of the Chief Economist (OCE) and the National Telecommunications and Information Administration (NTIA) researched the available data to measure the economic value of cross-border data flows and documented the unmet data needs. See more information on this effort at: <https://www.commerce.gov/news/blog/2016/05/commerce-brings-stakeholders-together-improve-digital-economy-metrics>.

<sup>3</sup> Grimm, A. Bureau of Economic Analysis (BEA). (2016). Trends in U.S. Trade in Information and Communications Technology (ICT) Services and in ICT-Enabled Services. Survey of Current Business. Retrieved from [http://bea.gov/scb/pdf/2016/05%20May/0516\\_trends\\_%20in\\_us\\_trade\\_in\\_ict\\_serivces2.pdf](http://bea.gov/scb/pdf/2016/05%20May/0516_trends_%20in_us_trade_in_ict_serivces2.pdf). (Last accessed July 13, 2016). See Appendix to see how estimates of ICT-enabled services trade differ when using the OECD services classification system versus the BEA services classification system.

<sup>4</sup> See Nicholson, J. & Noonan, R. Office of the Chief Economist, Economics and Statistics Administration (ESA), U.S. Department of Commerce. (2014). Digital Economy and Cross-Border Trade: The Value of Digitally-Deliverable Services. Retrieved from <http://www.esa.doc.gov/sites/default/files/digitaleconomyandtrade2014-1-27final.pdf>. p. 1. (Last accessed July 13, 2016) and Noonan, R. Office of the Chief Economist, Economics and Statistics Administration (ESA), U.S. Department of Commerce. (2015,

foreign trade in these services for the United States, this report reviews the definition of ICT-enabled services and presents estimates of the value of ICT-enabled services trade for the 28 nations that comprise the European Union (EU), as well as for the United States, using data compiled by the Organisation for Economic Cooperation and Development (OECD).<sup>5</sup> (see box: “Data Limitations” for more information). It also provides a detailed look at EU ICT-enabled services exports by country of origin and by service category, as well as a comparison with the United States’ ICT-enabled services exports. This is followed by a short overview of ICT-enabled services imports into the EU.

In 2014, the European Union (EU) exported \$1.2 trillion in ICT-enabled services, out of total services exports of \$2.2 trillion—an increase in ICT-enabled services exports of 36 percent from 2010, the first year for which comparable data is available from the OECD. This includes exports to other EU member states as well as non-EU countries. In the same year, EU countries imported \$935.1 billion of these services. Excluding trade between EU member states, EU ICT-enabled services exports totaled \$569.6 billion and imports totaled \$418.0 billion, resulting in a net surplus of \$151.6 billion. The available data show that the UK had the highest value of ICT-enabled exports in 2014, primarily due to exports of financial services. The United States was a large consumer of EU ICT-enabled services exports, purchasing 16 of the EU’s total exports of these services that year.

### Box: Data Limitations

The data used in this report is compiled by the OECD from national statistical agencies of EU member states and, for U.S. data, from the Bureau of Economic Analysis (BEA). By definition, country A’s reported exports to country B should equal country B’s reported imports from country A. However, in practice, this data generally does not match and the differences between the reported values can be substantial.

Both the OECD and BEA have noted that collecting data on services imports is challenging. Generally, firms that produce and export services are easy to identify and therefore, it is relatively easy to collect data on their exports. On the other hand, potentially all firms can import services, so the firms that should be surveyed are harder to identify. In addition, they may underreport their purchase of international services because they forget to report them, do not track them in a way

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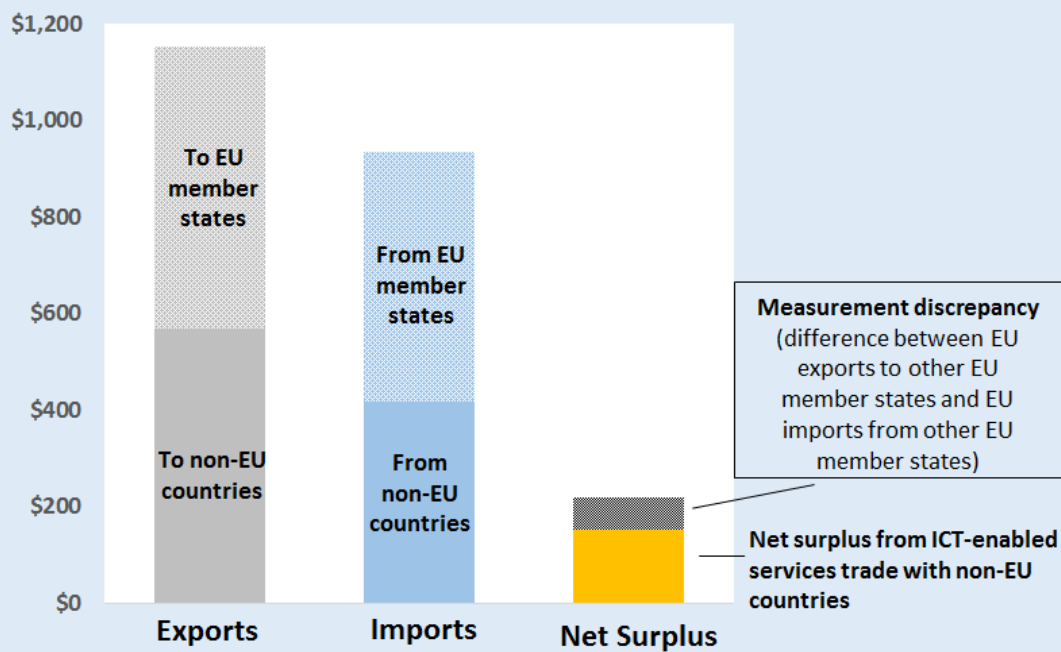
May 28). Digitally Deliverable Services Remain an Important Component of U.S. Trade. Retrieved from <http://esa.doc.gov/economic-briefings/digitally-deliverable-services-remain-important-component-us-trade>. (Last accessed July 13, 2016)

<sup>5</sup> Specifically, estimates in this report are based on the OECD Statistics on International Trade in Services: Volume II - Detailed Tables by Partner Country (Complete Edition - ISBN 9264013849). The data can be accessed online [from http://stats.oecd.org/](http://stats.oecd.org/). To navigate to the data, click on “International Trade and Balance of Payments” from the menu panel on the left. Then select “Trade in Services,” then “Trade in services by partner country,” and then “EBOPS 2010.” Data are collected by national statistical organizations and compiled by the OECD.

**Box: Data Limitations (continued)**

that makes them easy to report, or do not realize that they are purchasing the services from overseas. For these reasons, services exports reported by country A to country B may be larger than the corresponding services imports reported by country B from country A. Additionally, each country collects trade data using its own methodology and survey forms. This causes measurement discrepancies as well and presents challenges in analyzing bilateral trade data. For example, EU exports to other EU member states should equal EU imports from other EU member states; in other words, intra-EU trade should net to zero. However, this is not the case. Using the OECD data, EU member states are found to have reported ICT-enabled services exports to other EU countries totaling \$583.9 billion but imports totaling \$517.1 billion—a difference of \$66.7 billion. This measurement discrepancy is shown in the figure below. For this reason, this report only reports net surpluses or deficits for EU member states trade with countries outside of the EU.

**Figure B1. European Union's International Trade in ICT-Enabled Services in 2014 (billions USD)**



Source: U.S. Department of Commerce, Office of the Chief Economist using data from the Organisation for Economic Cooperation and Development.

On the other hand, when comparing Table 2 and Figure 6 of this report, in Table 2 it can be seen that U.S. exports of ICT-enabled services to the EU were reported to be \$147.6 billion, which is smaller than the EU's reported imports of \$167.6 billion of these services (Figure 6). It is important to keep these limitations in mind when comparing the services exports or imports of two or more countries.



## Potentially ICT-Enabled Services

As defined by the United Nations Conference on Trade and Development (UNCTAD), "potentially ICT-enabled services" are services that *can be* "delivered remotely over ICT networks."<sup>6</sup> These "include activities that can be specified, performed, delivered, evaluated and consumed electronically." The estimates of the value of the trade in ICT-enabled services previously published by the BEA and OCE use this definition and this report follows the same. However, since these are estimates of *potentially* ICT-enabled services trade, they represent an upper bound of the total amount of these services that are *actually* provided via ICT networks.<sup>7</sup>

The value of EU ICT-enabled services trade can be calculated using the UNCTAD definition and the OECD data on trade in services based on the 2010 extended balance of payments services (EBOPS) classification. Again, this methodology classifies services trade by type of service and not mode of delivery (See Table 1).<sup>8</sup>

## ICT-Enabled Services Trade in the European Union

The 28 member states in the EU in 2014<sup>9</sup> exported \$1.2 trillion in ICT-enabled services, 52 percent of all EU services exports that year. (See Figure 1). EU exports of ICT-enabled services increased every year from 2010, the earliest year with comparable data, to 2014, growing 36 percent over this period. In the same year, EU countries imported \$935.1 billion in ICT-enabled services, accounting for 49 percent of all services imports.

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<sup>6</sup> United Nations Conference on Trade and Development (UNCTAD). 2015, October. International Trade in ICT Services and ICT-Enabled Services, Proposed Indicators from the Partnership on Measuring ICT for Development. Technical Note No. 3 unedited. TN/UNCTAD/ICT4D/03. Retrieved from [http://unctad.org/en/PublicationsLibrary/tn\\_unctad\\_ict4d03\\_en.pdf](http://unctad.org/en/PublicationsLibrary/tn_unctad_ict4d03_en.pdf). (last accessed July 12, 2016)

<sup>7</sup>The World Trade Organization's (WTO) General Agreement on Services Trade (GATS) defines four modes of supply for international services. ICT-enabled services trade is included in mode 1, cross-border supply, which covers service flows from the territory of one country into the territory of another country (e.g., banking or architectural services transmitted via telecommunications or mail). However, not all mode 1 services are delivered digitally and the method of delivery is not captured by most countries' trade statistics. Therefore, it is not possible to distinguish between cross-border services that were delivered electronically and those that were not. See World Trade Organization at [https://www.wto.org/english/tratop\\_e/serv\\_e/gatsqa\\_e.htm](https://www.wto.org/english/tratop_e/serv_e/gatsqa_e.htm) and Bureau of Economic Analysis (BEA). U.S. International Economic Accounts. Chapter 14: Modes of Supply for International Services. Retrieved from <http://www.bea.gov/international/pdf/concepts-methods/14%20Chapter%20ITA-Methods.pdf>. (Last accessed July 13, 2016).

<sup>8</sup> For a full detailed listing of the EBOPS 2010 classification, see: <http://www.oecd.org/std/its/EBOPS-2010.pdf>. Some services within the omitted categories may be ICT-enabled, but it is not possible to disaggregate the services data beyond the categories listed in the text of this report and Table. 1. The Appendix to this report shows estimates of U.S. ICT-enabled services exports vary depending on which services classification is used. The services included in the ICT-enabled services trade estimates presented in this report are similar to those used by Grimm, 2016, page 7, box on "Worldwide Trends in ICT-Enabled Trade in Service." The exception is that the ICT-enabled services estimates presented in this report also include audiovisual and related services and education services categorized under "selected personal, cultural, and recreational services."

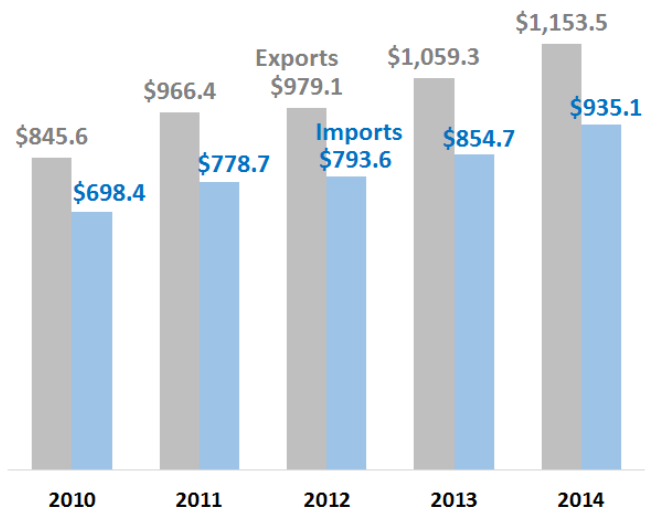
<sup>9</sup> These 28 member states are: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom. On June 23, 2016, the UK held a referendum in which 52 percent of voters decided that the UK will leave the EU. For now, it is unclear exactly when they will officially withdraw from the EU. For more information, see: <http://www.bbc.com/news/uk-politics-32810887>.

<b>Table 1. Services Included in Potentially ICT-Enabled Services</b>	
<b>Included services</b>	<b>Name of service</b>
	<b>All services</b>
	<b>Manufacturing services on physical inputs owned by others</b>
	<b>Maintenance and repair services n.i.e.</b>
	<b>Transport</b>
	<b>Travel</b>
	<b>Construction</b>
✓	<b>Insurance and pension services</b>
✓	Direct insurance
✓	Reinsurance
✓	Auxiliary insurance services
✓	<b>Financial services</b>
✓	Explicitly charged and other financial services
✓	Financial intermediation services indirectly measured (FISIM)
✓	<b>Charges for the use of intellectual property n.i.e</b>
✓	Franchises and trademarks licensing fees
✓	Licenses for the use of outcomes of research and development
✓	Licenses to reproduce and/or distribute computer software
✓	Licenses to reproduce and/or distribute audiovisual and related products
✓	<b>Telecommunications, computer, and information services</b>
✓	Telecommunications services
✓	Computer services
✓	Information services
✓	News agency services
✓	Other information services
	<b>Other business services</b>
✓	Research and development services
✓	Professional and management consulting services
✓	Legal, accounting, auditing, bookkeeping, and tax consulting services
✓	Advertising, market research, and public opinion polling services
	Technical, trade-related and other business services
✓	Architectural, engineering, scientific and other technical services
	Waste treatment and de-pollution, agricultural and mining services
	Operating leasing services
	Trade-related services
✓	Other business services n.i.e.
	<b>Personal, cultural, and recreational services</b>
✓	Audiovisual and related services
	Other personal, cultural, and recreational services
	Health services
✓	Education services
	Heritage and recreational services
	Other personal services
	<b>Government goods and services n.i.e.</b>
	<b>Services not allocated</b>
<p>Note: The services are listed as presented in the 2010 extended balance of payments services (EBOPS) classification. This table does not display some of the detailed services categories defined in the EBOPS.</p> <p>Source: U.S. Department of Commerce, Office of the Chief Economist using information from the Organisation for Economic Cooperation and Development.</p>	

Excluding intra-EU trade, EU member states exported \$569.6 billion in ICT-enabled services and imported \$418.0 billion in these services, resulting in a net surplus of \$151.6 billion. ICT-enabled services trade is important for the EU economy not only because of its volume, but also because of the resulting trade surplus. Looking at only external trade, the EU ran a trade surplus in most of these services categories in 2014. The exceptions were charges for the use of intellectual property products (IP) n.i.e. and selected personal, cultural, and recreational services. (See Figure 2).

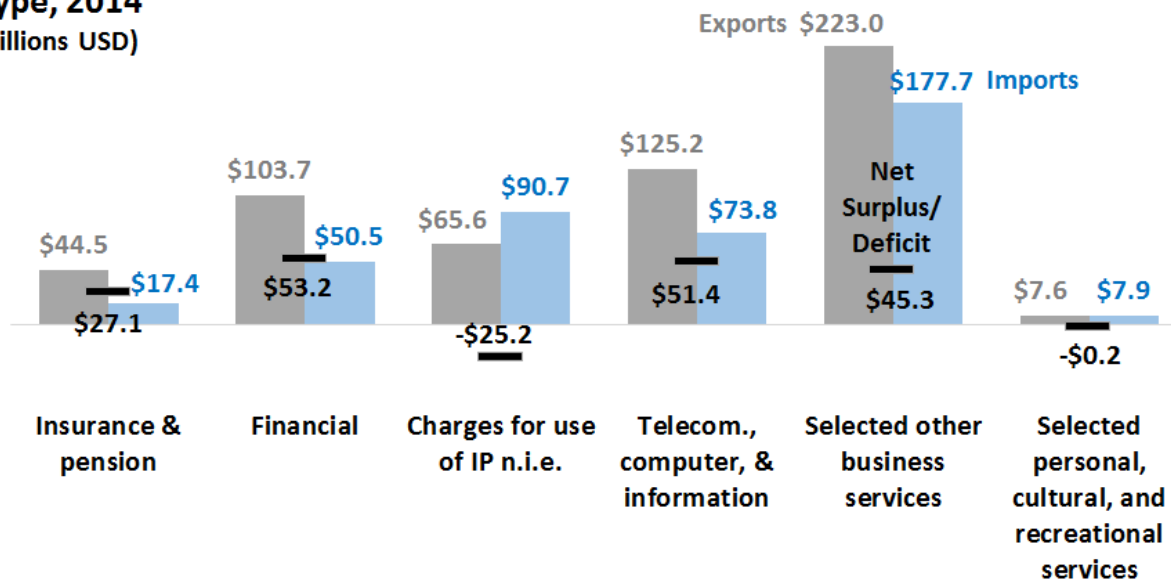
The remainder of this report takes a more detailed look at EU ICT-enabled services exports by service type and also by destination. A brief look at imports is also included.

**Figure 1. European Union's International Trade in ICT-Enabled Services**  
(billions USD)



Source: U.S. Department of Commerce, Office of the Chief Economist using data from the Organisation for Economic Cooperation and Development.

**Figure 2. European Union's External Trade in ICT-Enabled Services by Service Type, 2014**  
(billions USD)



Note: Intra-EU trade is excluded.

Source: U.S. Department of Commerce, Office of the Chief Economist using data from the Organisation for Economic Cooperation and Development.



## Exports

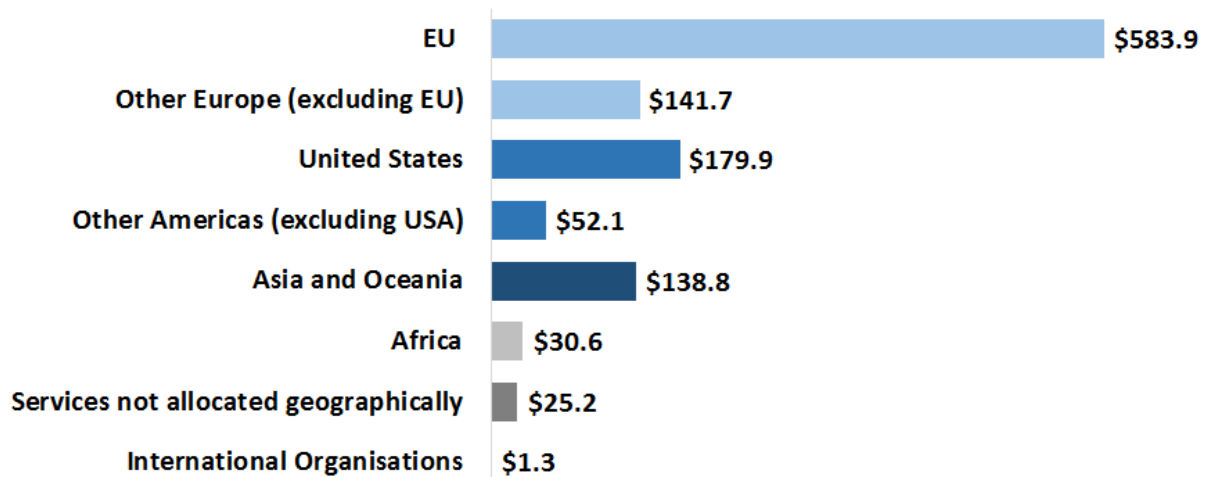
Of the estimated \$1.2 trillion in ICT-enabled services exports from EU member states in 2014, just over half stayed within the EU. The remaining \$569.6 billion were transmitted all over the world (See Figure 3). Outside of the EU, the United States was the largest purchaser of ICT-enabled services from EU member states; based on the OECD data, \$179.9 billion of EU exports in these services went to the United States in 2014. Only \$141.7 billion, or 12 percent of all EU ICT-enabled services exports, were exported to European countries that are not part of the EU. Asia and Oceania (including the Middle East) purchased \$138.8 billion of EU ICT-enabled services exports that year.

Figure 4 shows EU ICT-enabled services exports for 2014 by category—led by, with a fairly large margin, selected other business services—and by whether they remained in the EU or went to the rest of the world. The share of ICT-enabled services that are estimated to have left the EU ranged from 41 percent for selected personal, cultural, and recreational services to 65 percent for charges for the use of IP n.i.e.

As can also be seen in Figure 4, even after excluding the services that are exported to other EU member states, EU exports of selected other business services, at \$223.0 billion in 2014, were substantial.

**Figure 3. Destination of EU Exports of ICT-Enabled Services, 2014**

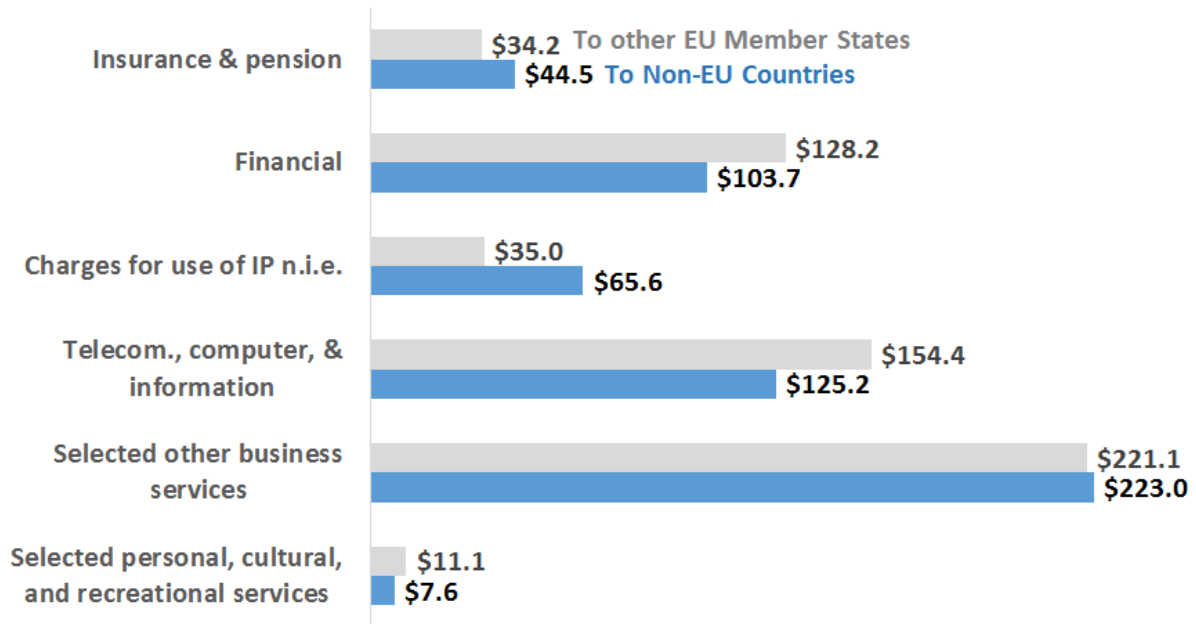
(billions USD)



Source: U.S. Department of Commerce, Office of the Chief Economist using data from the Organisation for Economic Cooperation and Development.



**Figure 4. EU Exports of ICT-Enabled Services by Service Type and Destination, 2014**  
(billions USD)



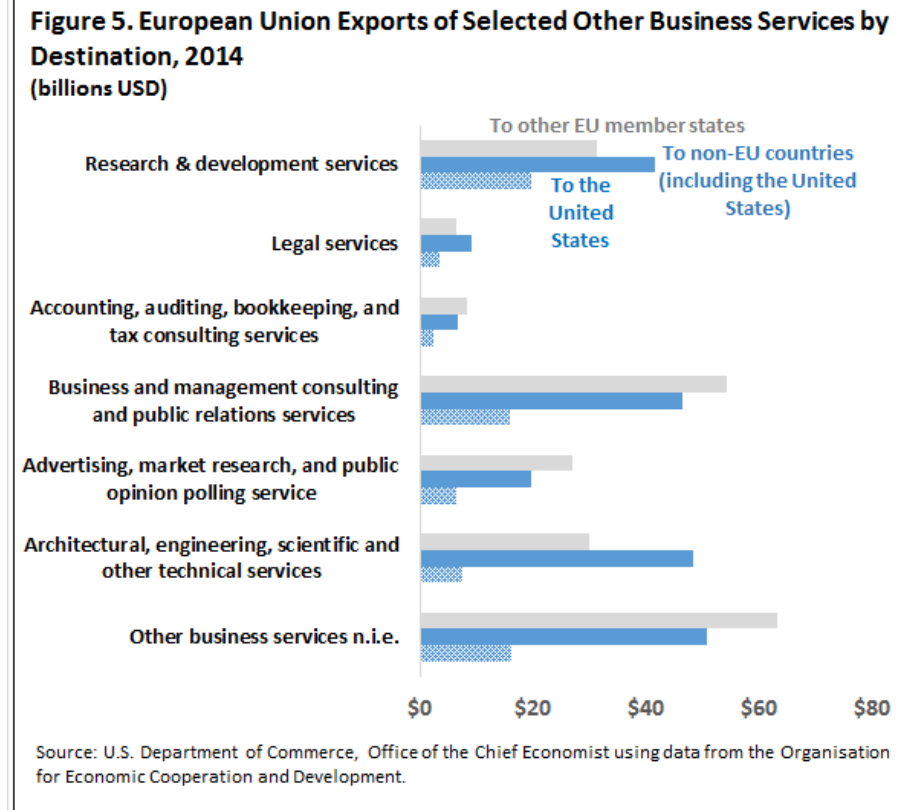
Source: U.S. Department of Commerce, Office of the Chief Economist using data from the Organisation for Economic Cooperation and Development.

Because the value of exports of selected other business services is so large, it is worth taking a look at the services that comprise that category. Within this group, exports of other business services n.i.e. accounted for the largest share at 26 percent, or \$114.1 billion; this total includes services that were exported to other EU member states and non-EU countries (see Figure 5; the exports outside of the EU are shown in blue). Business and management consulting and public relations services accounted for another 23 percent, or \$101.0 billion. Architectural, engineering, scientific and other technical services made up 18 percent, and R&D services accounted for 16 percent. The OECD data shows that the United States was the biggest non-EU purchaser of these other business services. In 2014, the U.S. received 16 percent of total EU exports of these services.

Recall that the United States was a relatively large consumer of all of the ICT-enabled business services exports to non-EU countries, purchasing 32 percent of these services in 2014. The United States purchased a relatively high share of R&D services (\$19.6 billion, or 47 percent). Switzerland was the other big non-EU consumer of EU business services exports in 2014. Of the services exported to countries outside of the EU, Switzerland purchased 36 percent of all the advertising, market research, and public opinion polling services, 31 percent of all business and

management consulting and public relations services, and 29 percent of all accounting, auditing, bookkeeping, and tax consulting services. Gulf Arabian countries in the Middle East purchased 15 percent of architectural, engineering, scientific and other technical services that the EU exported to non-EU countries, well above the overall average value of external EU ICT-enabled services exports to that destination (4 percent).

While it is valuable to know the total value of ICT-enabled services exports leaving the EU, and the destinations of these exports, it is also valuable to know from which member states they are originating. The value of ICT-enabled services exports can also be calculated for many, though not all, of the 28 EU member countries.<sup>10</sup> Table 2 displays the ICT-enabled services exports for the 12 largest economies in the EU.<sup>11</sup> In 2014, four EU member states had estimated exports of ICT-enabled services totaling over \$100 billion; the United Kingdom (UK) exported \$159.0 billion in



<sup>10</sup> For some countries, certain data are suppressed to maintain confidentiality. Therefore, it is not always possible to get an accurate measure of trade in ICT-enabled services. For example, as shown in Table 1, only certain categories within “other business services” and “personal, cultural, and recreational services” should be counted as ICT-enabled export or imports. However, several member states are missing data on some of the services in these categories that designated as ICT-enabled. If the entire categories of “other business services” or “personal, cultural, and recreational services” were included as an alternative, that would create an upward bias in the overall estimate. To be conservative, the estimates in Table 2 are based on available data and note any missing data in footnotes.

<sup>11</sup> Size of EU member states are based on value of 2015 GDP, measured in current USD, from the World Bank’s World Development Indicators database available at: <http://data.worldbank.org/data-catalog/world-development-indicators>.

ICT-enabled services, followed by Germany (\$149.2 billion), France (\$128.0 billion), and the Netherlands (\$115.3 billion).

<b>To all destinations</b>							
	Total	Insurance and pension	Financial	Charges for the use of intellectual property n.i.e.	Telecommunications, computer, and information	Selected other business services	Selected personal, cultural, and recreational services
United Kingdom	\$159.0 <sup>1</sup>	\$33.1	\$81.0	\$18.0	\$26.9	-- <sup>2</sup>	-- <sup>2</sup>
Germany	\$149.2	\$9.8	\$23.7	\$13.8	\$28.8	\$71.7	\$1.5
France	\$128.0	\$7.9	\$14.8	\$14.1	\$18.8	\$69.8	\$2.6
Netherlands	\$115.3	\$1.6	\$6.5	\$19.7	\$46.9	\$38.0	\$2.6
Ireland	\$97.6 <sup>3</sup>	\$12.3	\$11.1	\$6.3	\$64.3	\$3.3 <sup>3</sup>	\$0.3
Belgium	\$64.9	\$1.9	\$7.6	\$3.3	\$11.8	\$39.3	\$1.0
Sweden	\$47.5	\$1.0	\$4.6	\$9.1	\$15.8	\$16.7	\$0.3
Italy	\$42.6	\$2.4	\$5.2	\$3.4	\$8.7	\$22.7	\$0.1
Spain	\$27.9 <sup>4,5</sup>	\$2.2	\$3.9	\$1.4	\$12.6	\$7.7 <sup>4</sup>	-- <sup>2</sup>
Austria	\$24.7	\$0.9	\$3.3	\$1.1	\$6.5	\$12.7	\$0.2
Poland	\$15.2	\$0.3	\$0.8	\$0.3	\$4.2	\$9.4	\$0.2
Denmark	\$14.7	\$0.3	\$0.8	\$2.5	\$4.1	\$6.6	\$0.4
United States	\$378.5 <sup>5</sup>	\$17.4	\$87.3	\$130.4	\$35.9	\$107.6	-- <sup>2</sup>
<b>To EU member states</b>							
	Total	Insurance and pension	Financial	Charges for the use of intellectual property n.i.e.	Telecommunications, computer, and information	Selected other business services	Selected personal, cultural, and recreational services
United Kingdom	\$56.6 <sup>1</sup>	\$4.0	\$33.3	\$6.9	\$12.4	-- <sup>2</sup>	-- <sup>2</sup>
Germany	\$74.8	\$5.2	\$16.9	\$4.0	\$14.6	\$33.2	\$0.9
France	\$63.2 <sup>6,7</sup>	\$6.8	\$8.4	\$4.6	\$11.2	\$31.1 <sup>6</sup>	\$1.2 <sup>7</sup>
Netherlands	\$51.7 <sup>8</sup>	-- <sup>2</sup>	\$2.5	\$4.7	\$25.8	\$17.1	\$1.6
Ireland	\$55.4 <sup>4</sup>	\$9.1	\$7.2	\$1.3	\$36.5	\$1.3 <sup>4</sup>	\$0.0
Belgium	\$41.7	\$1.3	\$4.9	\$2.2	\$8.5	\$24.1	\$0.7
Sweden	\$22.9	\$0.6	\$2.4	\$4.4	\$5.7	\$9.8	\$0.2
Italy	\$23.2	\$1.4	\$4.3	\$1.1	\$4.8	\$11.5	\$0.0
Spain	\$15.2 <sup>3,4</sup>	\$0.7	\$2.9	\$0.8	\$5.8	\$5.0 <sup>4</sup>	-- <sup>2</sup>
Austria	\$16.8	\$0.7	\$2.1	\$0.8	\$4.4	\$8.6	\$0.1
Poland	\$10.4	\$0.2	\$0.6	\$0.2	\$2.9	\$6.3	\$0.1
Denmark	\$8.2	\$0.2	\$0.6	\$1.0	\$2.5	\$3.7	\$0.2
United States	\$147.6 <sup>3,5</sup>	\$3.4	\$34.2	\$52.5	\$11.8	\$45.7 <sup>3</sup>	-- <sup>2</sup>

See table notes and source on the following page.

Table 2 also shows the ICT-enabled services exports by services category, for those categories with available data, and by destination. While selected other business services, telecommunications, computer and information services, and financial services were overall the three largest exports categories for the EU in 2014, various member states relied on exports across the six ICT-enabled services categories to different degrees.

For example, the UK exported the highest value of financial services (\$81.0 billion), by far, of any other member state. Financial services exports were less important to Poland, where exports in this category accounted for only 5 percent of ICT-enabled services exports. Although insurance and pension services was one of the smaller export categories for the EU overall in 2014, these services were important exports for the UK and Ireland, which exported \$33.1 billion and \$12.3 billion in these services, respectively.

**Table 2. (cont.) Exports of Potentially ICT-Enabled Services by Selected EU Member States and the United States, 2014 (billions USD)**

To destinations outside of the EU								
	Total	Insurance and pension	Financial	Charges for the use of intellectual property n.i.e.	Telecommunications, computer, and information	Selected other business services	Selected personal, cultural, and recreational services	
United Kingdom	\$102.4 <sup>1</sup>	\$29.1	\$47.7	\$11.1	\$14.5	-- <sup>2</sup>	-- <sup>2</sup>	
Germany	\$74.4	\$4.5	\$6.9	\$9.8	\$14.2	\$38.5	\$0.6	
France	\$47.3 <sup>5,6</sup>	\$1.2	\$6.4	\$9.5	\$7.6	\$21.6 <sup>5</sup>	\$1.2 <sup>7</sup>	
Netherlands	\$62.0 <sup>8</sup>	-- <sup>2</sup>	\$4.0	\$15.0	\$21.1	\$21.0	\$1.0	
Ireland	\$41.9 <sup>3</sup>	\$3.2	\$3.9	\$5.1	\$27.8	\$1.7 <sup>4</sup>	\$0.3	
Belgium	\$23.2	\$0.5	\$2.8	\$1.2	\$3.3	\$15.2	\$0.2	
Sweden	\$24.5	\$0.4	\$2.3	\$4.7	\$10.1	\$6.9	\$0.1	
Italy	\$19.4	\$1.0	\$0.9	\$2.3	\$3.9	\$11.2	\$0.0	
Spain	\$12.6 <sup>3,5</sup>	\$1.4	\$1.0	\$0.6	\$6.8	\$2.7 <sup>4</sup>	-- <sup>2</sup>	
Austria	\$7.9	\$0.2	\$1.2	\$0.3	\$2.1	\$4.1	\$0.0	
Poland	\$4.8	\$0.1	\$0.2	\$0.1	\$1.4	\$3.1	\$0.1	
Denmark	\$6.4	\$0.1	\$0.3	\$1.4	\$1.6	\$2.9	\$0.2	
United States	\$228.4 <sup>3,5</sup>	\$14.0	\$53.0	\$77.9	\$24.1	\$59.4 <sup>3</sup>	-- <sup>2</sup>	
To the United States								
	Total	Insurance and pension	Financial	Charges for the use of intellectual property n.i.e.	Telecommunications, computer, and information	Selected other business services	Selected personal, cultural, and recreational services	
Germany	\$26.6	\$1.7	\$2.6	\$3.4	\$5.1	\$13.5	\$0.3	
France	\$14.0 <sup>5,9</sup>	\$0.2	\$1.5	\$3.6	\$2.8	\$6.0 <sup>9</sup>	-- <sup>2</sup>	
Netherlands	\$18.5 <sup>8</sup>	-- <sup>2</sup>	\$2.5	\$4.6	\$4.2	\$7.2	\$0.1	
Sweden	\$7.2	\$0.0	\$0.3	\$2.6	\$3.0	\$1.2	\$0.0	
Italy	\$4.4	\$0.1	\$0.3	\$0.3	\$1.1	\$2.6	\$0.0	
Austria	\$1.0	\$0.0	\$0.1	\$0.1	\$0.4	\$0.4	\$0.0	
Poland	\$1.7	\$0.0	\$0.0	\$0.0	\$0.5	\$1.0	\$0.0	
Denmark	\$1.5	\$0.0	\$0.0	\$0.5	\$0.4	\$0.6	\$0.0	

## Notes:

<sup>1</sup>Excludes selected other business services and selected personal, cultural, and recreational services because some or all of the data needed to estimate exports for these services is suppressed to maintain confidentiality or otherwise not available.

<sup>2</sup>Some or all of the data needed to estimate this value is suppressed to maintain confidentiality or is otherwise not available. To be conservative and avoid overestimating, no estimate is calculated.

<sup>3</sup>Excludes other business services n.i.e. because data for services is not available.

<sup>4</sup>Excludes architectural, engineering, scientific, and technical services and other business services n.i.e. from other business services. Data for these services is suppressed to maintain confidentiality or is otherwise not available.

<sup>5</sup>Excludes selected personal, cultural, and recreational services. Data for these services is suppressed to maintain confidentiality or is otherwise not available.

<sup>6</sup>Excludes architectural, engineering, scientific, and technical services from other business services. Data for these services is suppressed to maintain confidentiality or is otherwise not available.

<sup>7</sup>Excludes educational services from selected personal, cultural, and recreational services because data for these services is not available.

<sup>8</sup>Excludes insurance and pension services.

<sup>9</sup>Excludes R&D services from selected other business services. Data is suppressed to maintain confidentiality or is otherwise not available.

Source: U.S. Department of Commerce, Office of the Chief Economist using data from the Organisation for Economic Cooperation and Development.

In contrast to the EU, the highest value of ICT-enabled services exports for the United States was in charges for the use of IP n.i.e., accounting for 34 percent of all U.S. ICT-enabled services exports in 2014. However, there were several EU member states that also exported a high share of their ICT-enabled services from this category including Sweden (19 percent), the Netherlands (17 percent), and Denmark (17 percent). All member states had relatively robust export flows relative to other ICT-enabled services categories in telecommunications, computer, and information services and in selected other business services.

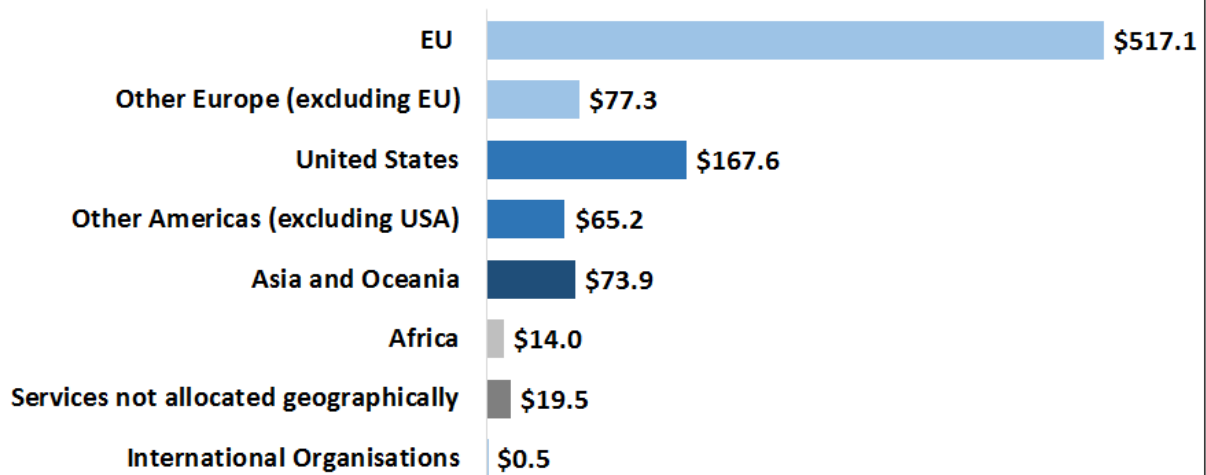
In addition, some member states are more likely to export ICT-enabled services outside of the EU than others. As the third section of Table 2 shows (“To destinations outside of the EU”), almost two-thirds of the UK’s estimated ICT-enabled services exports left the EU, including 88 percent of the exports in insurance and pension services. In Austria, only 32 percent of ICT-enabled services exports were purchased by non-EU countries.

The last section of Table 2 shows the shares of ICT-enabled services exports of selected EU member states to the United States by category.<sup>12</sup> For Sweden, the Netherlands, and Germany, 15 percent or more of the ICT-enabled services exports were purchased by the United States.

## Imports

In 2014, the EU imported \$935.1 billion in ICT-enabled services, 49 percent of all EU services imports that year. More than half of the ICT-enabled services imports, 55 percent, originated from other EU member states. (See Figure 6). Another 25 percent of the services, or \$232.8 billion, originated in the Americas, with 18 percent coming from the United States. Switzerland was the second largest non-EU provider of ICT-enabled imports to the EU, contributing 6 percent, or \$51.6 billion of the imports of these services in 2014.

**Figure 6. Origination of EU Imports of ICT-Enabled Services, 2014**  
(billions USD)

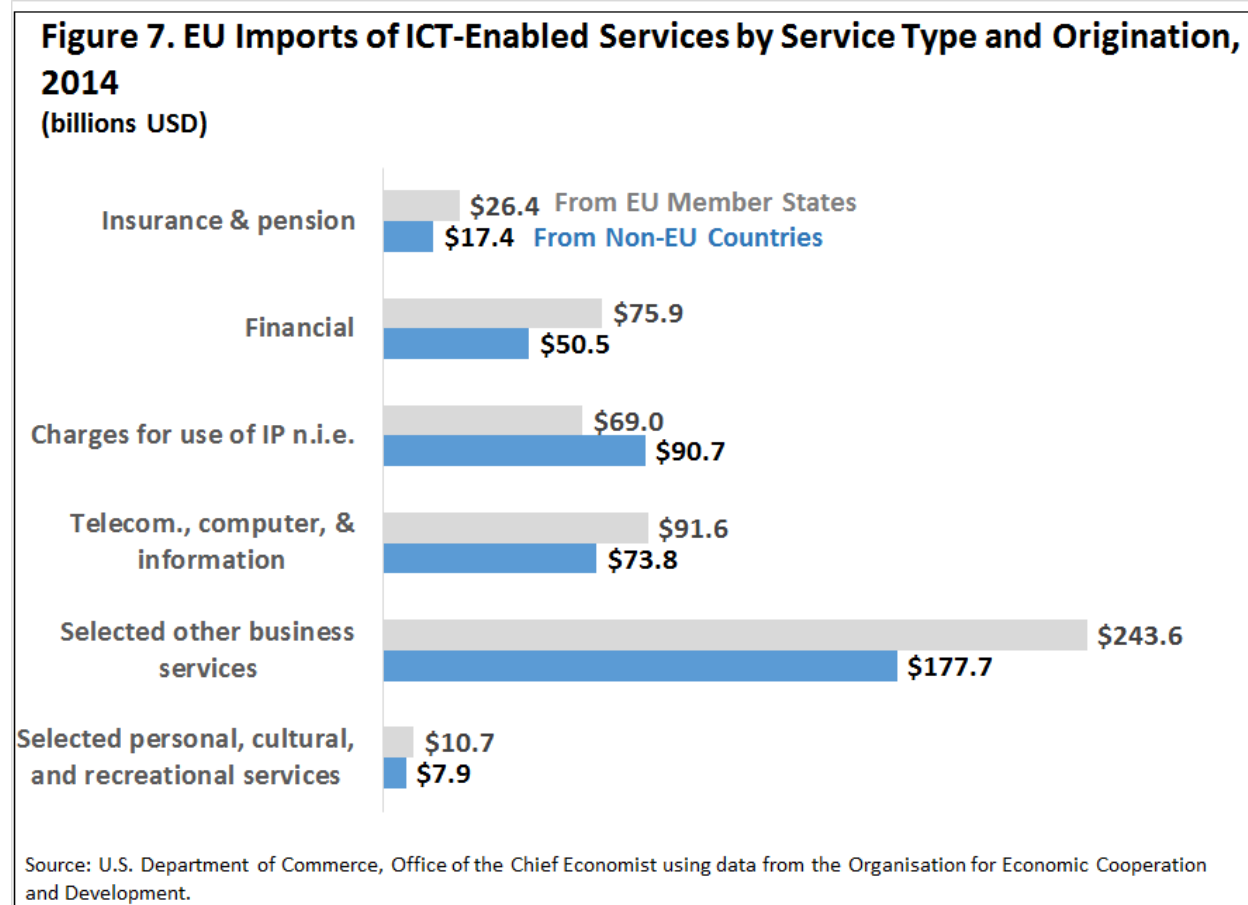


Source: U.S. Department of Commerce, Office of the Chief Economist using data from the Organisation for Economic Cooperation and Development.

By service type, as shown in Figure 7, the share of EU ICT-enabled services imports that originated from non-EU member states in 2014 ranged from 40 percent for insurance and pension services (\$17.4 billion out of \$43.7 billion) and financial services (\$50.5 billion out of \$126.4 billion) to 57 percent for charges for the use of IP n.i.e. (\$90.7 billion out of \$159.7

<sup>12</sup> Estimates are shown only for countries with sufficient data.

billion). Of the \$90.7 billion of charges for the use of IP n.i.e. from non-EU countries, the United States supplied 41 percent, or \$37.0 billion. The United States also supplied a relatively large share of the \$223.0 billion of selected other business services originating outside of the EU (32 percent, or \$71.3 billion).



## Conclusion

As technological advances continue to redefine how we consume and produce services, the economic statistics used to measure international trade particularly with respect to ICT-enabled services will need to be enhanced. As noted above, the best available official statistics measure services that are potentially traded digitally, rather than those services that are actually delivered digitally. Efforts are underway both at the Department of Commerce and worldwide to improve the availability of data that can help government statistical agencies and other researchers accurately measure actual ICT-enabled trade as well as other types of cross-border digital data flows.

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*Any errors in the report are solely the author's responsibility.*

## Appendix – A Comparison of ICT-Enabled Services Definitions

A May 2016 BEA report estimated U.S. exports of potentially ICT-enabled services at \$385.1 billion in 2014.<sup>13</sup> Above, this report estimates that the United States exported \$378.5 billion of ICT-enabled services that year, a difference of \$6.6 billion. Even though BEA supplies the OECD with the data on U.S. international services trade, estimates of ICT-enabled services exports using data available from the two organizations do not match because the BEA and OECD classify services trade differently. The OECD uses the 2010 Extended Balance of Payments Services (EBOPS) classification, while the BEA uses a similar, but unique services classification system.<sup>14</sup>

Table A1 shows the services included in the ICT-enabled services estimates using the EBOPS 2010 classification and BEA's international trade in services classification. For many of the categories, the EBOPS services directly match the BEA services.

**Table A1. Comparison of Services Included in ICT-Enabled Services and United States ICT-Enabled Services Export Value, 2014 (billions USD)**

EBOPS 2010 Classification used by OECD			BEA Classification		
All services			All services		
Insurance and pension services	\$17.4		\$17.4	Insurance services	
Financial services	\$87.3		\$87.3	Financial services	
Charges for the use of intellectual property n.i.e	\$130.4		\$130.4	Charges for the use of intellectual property n.i.e.	
Telecommunications, computer, and information services	\$35.9		\$35.9	Telecommunications, computer, and information services	
Other business services			Other business services		
Research and development services	\$33.2		\$33.2	Research and development services	
Professional and management consulting services	\$59.5		\$59.5	Professional and management consulting services	
Technical, trade-related and other business services				Technical, trade-related, and other business services	
Architectural, engineering, scientific and other technical services	\$12.3		\$12.3	Architectural and engineering services	
	[i]		\$4.1	Industrial engineering	
			\$2.5	Training services	
Other business services n.i.e.	\$2.5		\$2.5	Other business services n.i.e.	
Personal, cultural, and recreational services					
Audiovisual and related services	--		[iii]		
Other personal, cultural, and recreational services	[ii]				
<b>Total U.S. ICT-Enabled services exports</b>	<b>\$378.5</b>		<b>\$385.1</b>	<b>Total U.S. ICT-enabled services exports</b>	

Notes:

- [i]. BEA's architectural and engineering services plus industrial engineering is roughly equivalent to the EBOPS category of architectural, engineering, scientific, and other technical services, so the value of exports for industrial engineering could be added into the total ICT-enabled service for the United States. However, OECD does not make this adjustment.
- [ii]. BEA's training services are largely equivalent to EBOPS 2010 education services, which are categorized other personal, cultural, and recreational services. However, the OECD database does not have data available for education services for the United States, so they are excluded from this estimate.
- [iii]. Audiovisual and related services should also be included in the estimates of ICT-enabled services exports using the OECD data. However, there is no data for this category available from BEA, and because BEA provides data for the United States to the OECD, there is therefore no data available from the OECD. This means that this difference in definition does not contribute to the difference in the values of the ICT-enabled services exports estimates presented here.

Source: U.S. Department of Commerce, Office of the Chief Economist using information from the Organisation for Economic Cooperation and Development and the Bureau of Economic Analysis.

<sup>13</sup> Grimm, 2016.

<sup>14</sup> BEA data on international services is available at: [http://www.bea.gov/iTable/index\\_ita.cfm](http://www.bea.gov/iTable/index_ita.cfm).



However, the other business services category differs between the EBOPS classification and the BEA classification. Unlike the EBOPS classification, the BEA classification separates out industrial engineering and includes it in its definition of ICT-enabled services; this represents \$4.1 billion of exports in 2014.

Training services as reported by BEA are largely equivalent to EBOPS 2010's education services category. In EBOPS, education services are categorized under other personal, cultural, and recreational services along with health services, heritage and recreational services, and other personal services. Although the OECD does have data available for education services for many countries, there is not data for the United States in this category because the OECD does not include BEA's training services data in their database under this service category. The exclusion of industrial engineering and education services using the OECD data fully explains the \$6.6 billion difference between the estimates using the two different classification systems.

Audiovisual and related services are also included in the definition of ICT-enabled services under the EBOPS 2010 classification system. However, because there is not a comparable services category available from the BEA, there is no data available from the OECD. This means that this difference in definition does not contribute to the difference in the values of the ICT-enabled services exports estimates presented here.

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**U.S. Department of Commerce  
Economics and Statistics Administration  
Office of the Chief Economist  
Room 4848  
1401 Constitution Ave., NW  
Washington, DC 20230  
[esa.doc.gov](http://esa.doc.gov)**

**Technical inquiries:  
Office of the Chief Economist  
(202) 482-3523**

**Media inquiries:  
Office of Communications  
(202) 482-3331**

