

Measuring International Trade in Services

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Introduction

Most of the literature on international trade that has accumulated over the last 300 years has dealt with trade in goods, and almost every country has had in place for many years a system of collecting information on such trade. In the mercantilist era, a surplus of exports over imports of goods was sought as a way of acquiring gold, and imports of goods were carefully watched and counted as a source of tax revenue. As a result, there has been an apparatus in place for measuring the inflow and outflow of goods in every country for centuries, based on counting and appraising the value of goods as they crossed the country's borders. Trade in goods among regions of a country is often studied by trying to approximate the movement of goods across regional, provincial, or state borders. Only recently, with the establishment of the single market in the European Union, have some major trading countries moved away from the traditional reliance on customs declarations at borders and been forced to invent other ways of measuring trade in goods (OECD, 2001, p. 3). The collection of data on trade in goods is governed by recommendations set forth in United Nations (2004), which translates for compilers of trade data the methodological guidelines adopted by the United Nations Statistical Commission. One of the principal recommendations is that countries use "...crossing the border rather than change of ownership as the basic principle for compilation of trade statistics..." (P. 5). The geographical basis of the data is emphasized by the recommendation that the data should "Record all goods which add to or subtract from the stock of natural resources of a country by entering (imports) or

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leaving (exports) its economic territory (p. 74), and by the definition of the partner in terms of the “statistical territory of its trading partners” or, when free zones are involved, the economic territory if the reporting country uses “the strict version of the special system of trade.” The definitions are all based on geography rather than ownership.

The measurement of trade in goods for the balance of payments has a different objective. That is the measurement of changes in the ownership of goods between residents and non-residents of a country. Since the great majority of such changes in ownership take place in connection with the physical movement of the goods, the measures are quantitatively close, and the balance of payments measures are mainly dependent on the data for the physical movement of goods and very close to them. However, since imports are reported on a c.i.f. basis in the goods trade data, and the balance of payments concept separates freight and insurance costs from the value of the physical commodities, one adjustment that is required is to peel off those costs and transfer them to the trade in services account.. Most of the differences between trade statistics and balance-of-payments measures for trade in goods involve the dependence of the balance of payments accounts on change of ownership rather than physical movement. Thus, the trade statistics include, and the balance of payments data exclude, goods purchased by travelers and brought home, because there is no change of ownership, while there is a change in location. Trade data include, but balance of payments figures exclude, goods imported for projects by non-resident construction enterprises and the major item on the export side, exports transferred under U.S. military agency sales contracts. The trade figures exclude, but the balance of payments figures include, Bunkers, Goods for repair and Goods entering or leaving a country illegally. Other adjustments involve, for example, timing in terms of change of ownership rather than terms of the change in the location of goods.

In contrast to trade in goods, trade in services does not have two alternative measurements. It exists only in the balance of payments universe. As is observed in OECD (2001), “Unlike trade in goods, trade in services involves no package crossing the customs frontier with accompanying documentation showing an internationally recognized commodity code, a description of the contents, information on quantity, origin, and destination, an invoice and an administrative system based on customs duty collection, which facilitates data compilation.” The difference is more than a question of documentation. Trade in services often involves no crossing of an international boundary by the service, but only a crossing of a border by the consumer of the service. Many trades in services are geographically domestic transactions made international solely by a difference in country of residence between the buyer and the seller of the service. It is a balance of payments concept more than a trade concept, and the definition of residence plays a crucial part in defining what trade in services is.

The size and growth of world trade in services.

Trade in services has been something of an orphan in international measurement, but interest in it has been growing. However, it is hard to say just how large it is, because the completeness of reporting varies greatly across countries. Some countries publish data, but they cover only limited types of services. Some important participants, such as Bermuda and the Cayman Islands, do not report to the IMF at all, although we know from their partners’ information that they are important transactors.

In 2002, the OECD countries as a group reported service exports of \$US 1,622 billion, 25 per cent of the value of exports of goods. And they reported service imports of \$US 1,631 billion, 26 per cent of reported imports of goods (OECD, 2003, Table A-1). Many countries that report to the IMF do not report service exports and imports, but those that do, reported exports of

\$US 1,885 billion and imports of \$US 1,887 billion in 2003 (IMF 2006). Of these countries, the 145 that reported both goods and services exports and imports reported exports of services that were 25.7 per cent of exports of goods, and imports of services that were 25.4 per cent of imports of goods (IMF 2006). Thus there is fairly general agreement on a current ratio of services trade to goods trade of about one quarter.

It is hard to judge how fast trade in services has been growing, because the number of countries measuring it has increased, and the number of categories covered by surveys and reporting has been growing over time, but to inconsistent degrees in different countries. For 22 countries that have reported service exports and imports to the IMF since 1972, and accounted for over half of “world” exports of services in 2003, the ratio of service exports to goods exports grew from 21 to over 28 per cent between 1972-76 and 2002-03. The corresponding ratio for imports rose from 24 to 26 per cent over that same period (Table 1). For a larger group of 30 countries that have reported service exports and imports since 1977, and accounted for two thirds of “world” service exports in 2003, the ratio of service exports to goods exports grew from about 22 to over 27 per cent between 1977-81 and 2002-03. The ratio for imports grew from 24-25 per cent to a peak of 28 per cent in 1992-96 and has since settled back to around 27 per cent. Thus there is some indication of an upward trend in at least the reported service trade relative to goods trade. Many countries are dropped from the recent IMF Balance of Payments CDs for years before 1972, presumably because the definitions and measures of service exports and imports did not match the current definitions. However, it is possible to put together series extending back somewhat further, to 1961, for 24 of the larger countries, from earlier IMF data (IMF, 1991). These show almost the same ratios of service trade to goods trade in 1972 as in Table 1, 25.2

Table 1: Service Exports and Imports as Percent of Goods Exports and Imports

Year	22 Countries ^a		30 Countries ^b	
	Exports	Imports	Exports	Imports
1972~1976	21.40	24.32	n.a.	n.a.
1977~1981	21.07	24.09	22.01	24.57
1982~1986	23.92	25.15	23.34	25.46
1987~1991	25.29	25.10	24.56	26.73
1992~1996	27.34	26.18	26.17	28.20
1997~2001	27.53	25.03	26.18	26.32
2002	28.87	25.91	27.68	27.10
2003	28.53	26.01	27.47	26.95

a. 22 countries include Australia, Austria, Barbados, Canada, Colombia, Dominican Rep., Germany, Haiti, Israel, Italy, Jordan, Malta, Netherlands, New Zealand, Romania, Saudi Arabia, Singapore, South Africa, Sweden, United Kingdom, United States and Venezuela.

b. 30 countries include the 22 countries, plus Argentina, Belgium-Luxembourg, Brazil, Denmark, Finland, France, India and Japan.

Source: Appendix Table A.

percent on the export side and 27.7 per cent on the import side. The corresponding ratios in 1961 were 26.6 per cent and 32 per cent, suggesting, if anything, a slight decline in the ratio, at least on the import side, but no very large changes over these 40+ years.

A further indication of the trend in the world importance of service trade can be gleaned from estimates for 1950-1954, purportedly covering the whole world (Woolley, 1966, Table 3, p. 23). These ratios exclude investment income, treated as service trade in the source). On the export side, they show service exports 21.6 per cent of goods exports, below the 1961 ratio, but almost the same as the average ratio for the first five years, starting in 1972, in Table 1. On the import side, the estimated ratio in 1950-1954 is over 24 per cent, again below the 1961 ratio, but almost exactly the average of 1972 to 1976 in Table 1. Thus, there is little indication of a strong trend in the ratio in the last 50 years if we assume that the adjustments made to the data for the earlier period had been adopted in the official data by 1972, or at least by 2002. However, if the same omissions in the official services data remain, and they are equally important in the later period (for example, Karreman, 1961, Table 20, p. 48, raised the reported transportation receipts by over a third and payments by almost half), some long term rise in the service/goods trade ratio is implied.

One reason for being suspicious about the apparent rising trend in service trade relative to goods trade is that not only has the number of countries reporting service trade to the IMF risen over the last 50 years, and even the last 30 years, but among those reporting, the number reporting particular types of service trade has increased even more. While the number of countries reporting total service exports to the IMF has not changed greatly since 1983, the number reporting exports of , for example, construction services, rose from 5 to 86, financial services, 8 to 109, computer and information services, 1 to 96, and personal, cultural, and

recreational services, 4 to 92 (Table 2). In some cases, the services may not have existed in the particular countries, or may not have been exported at all. In other cases, they might have been reported under “other business services.” Neither of these reasons would imply any bias in the overall ratios. However, it seems more likely that at least some of these services were traded, but no device was in place for collection of data on them, in which case the increasing numbers of reporters would imply upward bias in the overall ratios.

Table 2: Number of Countries Reporting Trade in Various Services from the Export Side

	1973	1975	1983	1993	2003
Total Services	23	61	141	156	154 ^a
Transportation	23	60	134	152	152 ^a
Passenger	12	39	98	103	124 ^b
Freight	18	49	110	112	119 ^b
Other Transportation	21	55	112	116	125 ^b
Travel	23	60	138	149	152 ^a
Government Services, nie	21	56	120	134	143 ^c
Other Services					
Communications	7	8	17	63	127
Construction	2	3	5	33	86 ^d
Insurance	14	44	103	108	133 ^e
Financial	2	2	8	38	109 ^f
Computer and Information	0	0	1	19	96 ^g
Royalties and License Fees	10	19	32	57	87
Other Business Services	22	60	138	148	146 ^c
Personal, Cultural and Recreational	4	3	4	23	92 ^h

a). For ten countries, data for 2002 are reported. They are Anguilla, Antigua and Barbuda, Dominica, Grenada, Malawi, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent & Grens., and Tonga.

b). For Malawi, the report is for 2002.

c). For nine countries, data for 2002 are reported. They are Anguilla, Antigua and Barbuda, Dominica, Grenada, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent & Grens., and Tonga.

d). For St. Kitts and Nevis, the report is for 2002.

e). For eight countries, data for 2002 are reported. They are Anguilla, Antigua and Barbuda, Dominica, Grenada, Montserrat, St. Kitts and Nevis, St. Lucia, and St. Vincent & Grens..

f). For seven countries, data for 2002 are reported. They are Anguilla, Antigua and Barbuda, Dominica, Grenada, Montserrat, St. Kitts and Nevis, and St. Vincent & Grens..

g). For St. Lucia, the report is for 2002.

h). For Tonga, the report is for 2002.

Source:
IMF (2006)

The same information for imports of services is provided in Table 3. In most cases, collection and reporting of data on particular imports and exports moved together, but there were exceptions. Reports of freight imports increased faster than those on freight exports, and the same was true for reports on insurance imports and construction imports. In general, however, types of services poorly reported in import records were the same as those poorly reported in export records, and the biases are probably similar on the two sides of the account.

Table 3: Number of Countries Reporting Trade in Various Services from the Import Side

	1973	1975	1983	1993	2003
Total Services	23	62	142	156	154 ^a
Transportation	23	62	142	154	154 ^a
Passenger	16	44	101	115	126 ^b
Freight	22	61	142	136	137 ^b
Other Transportation	17	51	107	109	114 ^b
Travel	23	60	137	152	151 ^a
Government Services, nie	21	57	121	141	148 ^c
Other Services					
Communications	7	9	19	62	129
Construction	3	4	5	37	100 ^d
Insurance	20	57	137	141	145 ^e
Financial	2	3	8	44	114 ^f
Computer and Information	0	0	2	20	105
Royalties and License Fees	12	26	57	70	120 ^e
Other Business Services	23	60	139	150	152 ^a
Personal, Cultural and Recreational	6	6	10	30	98 ^g

- a). For ten countries, data for 2002 are reported. They are Anguilla, Antigua and Barbuda, Dominica, Grenada, Malawi, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent & Grens., and Tonga.
- b). For Malawi, the reports is for 2002.
- c). For nine countries, data for 2002 are reported. They are Anguilla, Antigua and Barbuda, Dominica, Grenada, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent & Grens., and Tonga.
- d). For five countries, data for 2002 are reported. They are Anguilla, Antigua and Barbuda, Dominica, Montserrat, and St. Kitts and Nevis.
- e). For nine countries, data for 2002 are reported. They are Anguilla, Antigua and Barbuda, Dominica, Grenada, Malawi, Montserrat, St. Kitts and Nevis, St. Lucia, and St. Vincent & Grens..
- f). For Dominica, Grenada, and St. Kitts and Nevis, the report is for 2002.
- g). For Malawi and Tonga, the report is for 2002.

Source: IMF (2006)

Even if there has not been any strong trend in world service trade relative to world goods trade over the last half century, the growth of service trade has outpaced the growth of world GDP, since the ratio of goods trade to GDP has risen substantially since 1950 in almost every country. However, since world production and employment have moved from goods producing to service producing industries, one might have expected a corresponding shift in the composition of trade. The absence of an obvious shift in that direction may reflect the fact that we are comparing nominal rather than real values of the two types of trade. If prices of traded services have fallen relative to prices of traded goods, the stability of the nominal ratio may conceal a more rapid growth in real service trade. There is evidence that costs of ocean transportation fell relative to prices of transported goods in the 19th Century (North, 1958). In the 20th Century, the winter time appearance of flowers from Latin America in shops in northern countries reveals the decline in costs of air transport. The prices of computer services and financial services have almost certainly fallen relative to prices of goods and services in general in the last 50 years. Thus, there is a strong probability that in quantity terms, trade in services has grown relative to trade in goods.

Reported imports of services were about 10 per cent larger than reported exports in 1950-1954 (Woolley, 1966, Table 3, p. 23). The same was true among 22 countries until the 1990s, sometimes by 10 per cent or more, but they have been much closer in size since then. That same trend is shown in the data for 30 countries since 1977, with the latest figures showing exports and imports almost equal in size (Appendix Table B). Either comparative advantages in service production have shifted toward these groups of 22 and 30 countries or there have been more improvements in measuring service exports than in measuring service imports.

A rough idea of the composition of world service trade in a recent year, as reported by the IMF, is given by Table 4. The three major elements are Transportation, Travel, and “Other Business Services.” The composition of reported imports is considerably different from that of reported exports. The direction and size of the discrepancies between reported export and reported import totals vary across service categories, probably because reporting by developed countries is more complete than that by developing countries. Thus, reported imports of freight transportation are much larger than reported exports, probably because imports of freight transportation services are mainly by developed countries from developing countries. On the other hand, for Financial and Computer and Information services, reported exports are much larger than reported imports, presumably because these are mainly export items for developed countries. Reported exports of Insurance Services are services are much smaller than reported imports, probably because exports are, relative to country size, disproportionately concentrated in Bermuda, which does not report to the IMF at all.

Table 4: The Composition of World Service Trade, 2003 (\$US Billions)³

	Exports	Imports
Total Services	1,841	1,811
Transportation ²	396	461
Passenger	77	83
Freight	152	224
Other Transportation	109	108
Travel	523	489
Government Services, nie	52	68
Other Services ¹	885	805
Communications ⁴	40	39
Construction ⁴	36	30
Insurance ⁴	56	86
Financial ⁴	97	45
Computer and Information ⁴	73	34
Royalties and License Fees ⁴	95	105
Other Business Service ⁴	451	433
Personal, Cultural & Recreational ⁴	24	22

Notes:

1. The imports and exports of Other Services are calculated by adding up the imports and exports of 145 countries in the Regional Tables in IMF (2006).
2. The imports and component services under Transportation do not add up to the import and export totals for Transportation, presumably because not all countries report the components.
3. All the data in this table are taken from "Current Account" for Economic Concept tables in IMF (2006)
4. Taiwan is not included.

Source: IMF (2006)

Some indication of the geography of international trade in services is given in Table 5, although again, the pattern may represent differences in reporting as much as differences in behavior. Given the problems in reporting, the data indicate that the developed, or industrial, countries as a group export services of a greater value than they import, while developing countries run an import surplus in services. However, the distinction between the two sets of countries does not govern the relationship completely. While the United States, France, and the UK report an export surplus in services, Japan and Germany report importing considerably more in services than they export. However, the developing country groups, except for those in Europe, all show import surpluses in services.

Table 5: The Geography of Service Trade, 2003 (\$US Billions)

	Exports	Imports
World	1,864	1,836
Industrial Countries	1,360	1,297
U.S.	306	257
Japan	78	112
Euro Area	632	628
France	99	83
Germany	123	172
UK	153	125
Developing Countries	523	579
Africa	33	43
Asia	265	282
Europe, excluding Industrial Countries	109	99
Middle East	56	84
Western Hemisphere	61	71

Note: Trade statistics for World is the sum of all the available trade statistics.

Source:
IMF (2006)

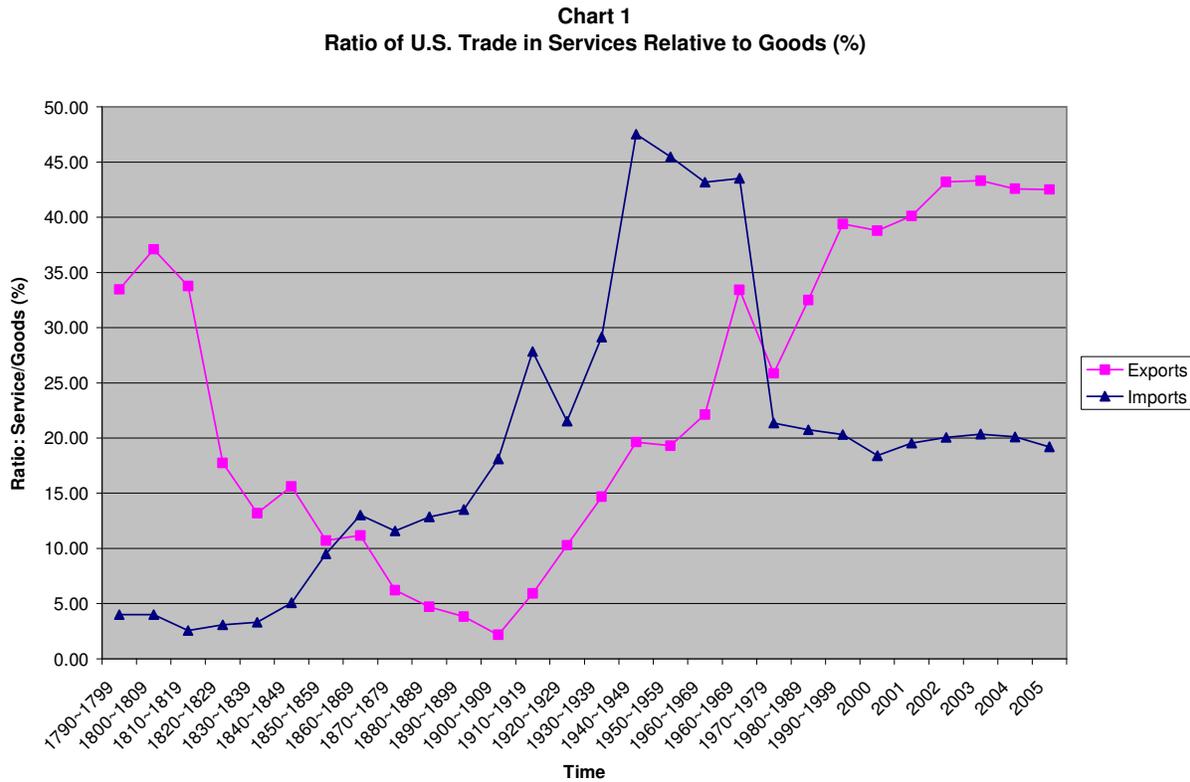
The size and growth of U.S. trade in services

The United States has been a leader in measuring service trade, perhaps because it offers a more cheerful picture of the U.S. international position than the goods trade account. In 2005, the United States reported a surplus of exports over imports in service trade, of \$US 57 billion , in contrast to a deficit in goods trade of over \$US 780 billion (Appendix Table C).

Services have recently been much larger relative to goods in U.S. exports (over 40 per cent) than in U.S. imports (20 per cent or so), presumably reflecting U.S. comparative advantage in service industries (Chart 1). Service exports were about 60 per cent as large as service imports during the 1930s, became larger than imports during World War II, fell back to half in the early 1950s, and then began to grow faster. By the early 1970s service exports began to surpass imports and have done so ever since. However, in the last five years, it has been service imports that have outpaced service exports (Appendix Table C).

The large current importance of services relative to goods in U.S. exports is not unprecedented. In the first 30 years of balance of payments records, 1790 to 1819, U.S. service exports averaged about a third of goods exports, but their relative importance trended downward from then, reaching a level of only 2 per cent of exports of goods in the early 1900s. Then they began a long rise in importance leading to the current high levels (Chart 1). Services were more important in U.S. exports than in U.S. imports in the early days of the United States, usually more than twice as important through the 1840s. After the Civil War, the relation was reversed, and services were generally much more important in imports than in exports in the latter half of the 19th Century and through the 1960s, reaching well over 40 per cent of goods imports during the years when goods imports were affected by World War II and the postwar recovery. As

goods imports grew rapidly starting in the 1970s, the ratio of service to goods imports receded to around 20 per cent, where it has remained since the 1970s (Chart 1).

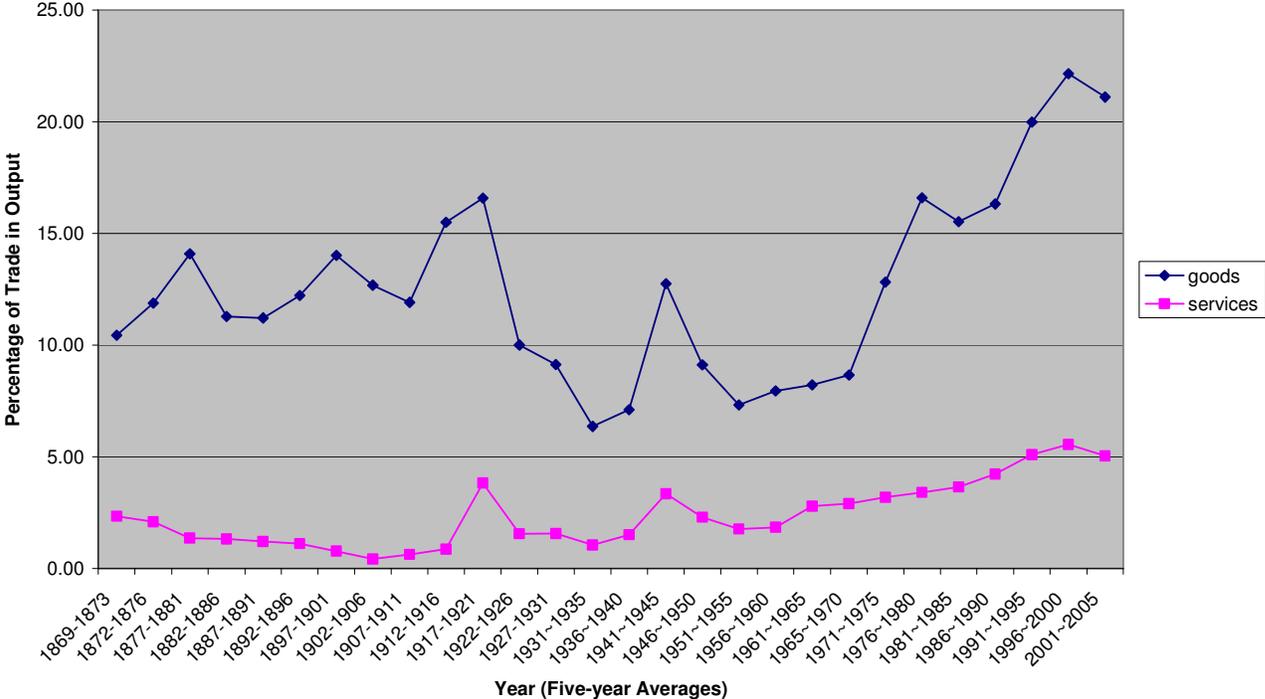


Source: Appendix Table C.

Services have often been treated as nontradables, and they are, in fact, less traded relative to their output. That is, exports and imports of services have been much smaller relative to the output of services, than exports and imports of goods, relative to the production of goods, at least since 1869. Aside from World War II, service exports were almost always less than 2 per cent of service output until the 1960s, according to contemporary estimates, later revised to almost 3 per cent for the 1960s. Since then, they have grown to usually about 5 per cent of service output. Goods exports have generally been much larger relative to goods output during the same period,

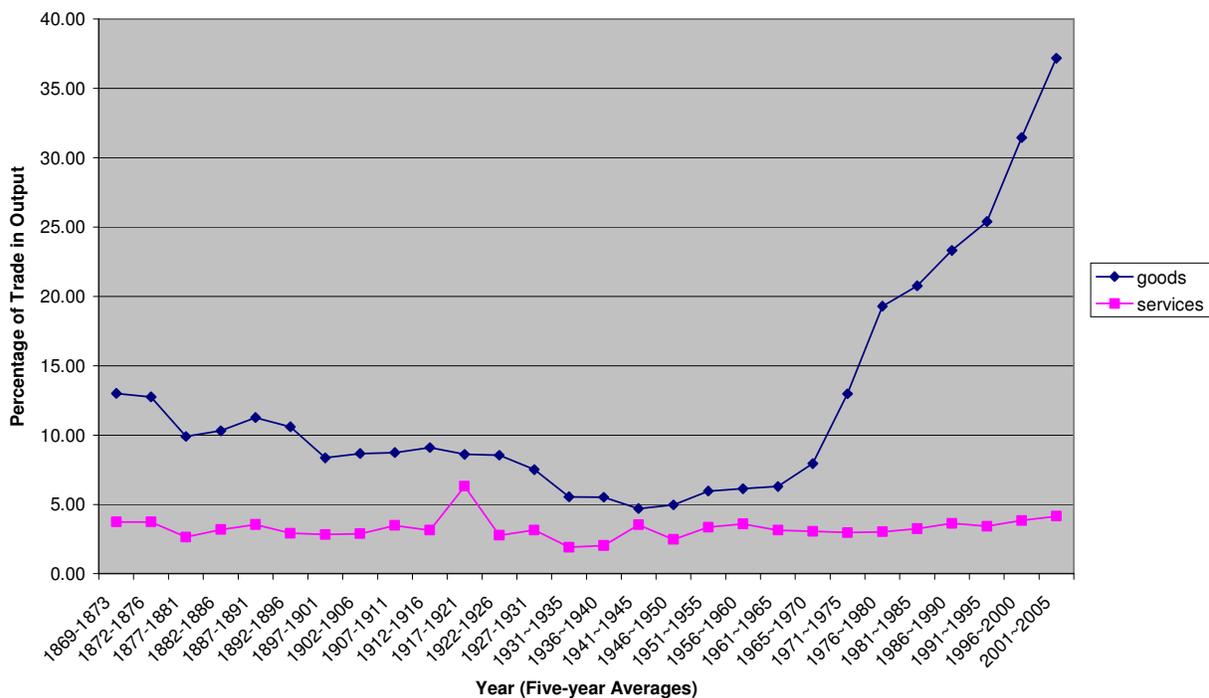
often 10 to 14 per cent before World War I, falling back to 7 or 8 per cent from 1929 through the 1960s and then rising, to above 20 per cent in most of the last decade (Chart 2). Service imports were larger, over 3 per cent during the 1960s, and reaching over 4 per cent of U.S. service output in recent years (Chart 3). Goods imports were 10 per cent of goods output in most of the late 19th century, ranged from 5 to 8 per cent of goods output most years from then through the 1960s, and then soared, to reach 35 to 40 per cent of GDP in goods production since 2000 (Chart 3).

Chart 2
U. S. Exports of Goods and Services as Percent U.S. Output of Goods and Services
(1869-2005)



Source: Appendix Tables D & E.

Chart 3
U.S. Imports of Goods and Services as Percent of U.S. Output of Goods and Services
(1869-2005)



Source: Appendix Tables D & E.

The ratios of trade to output, particularly for goods, exaggerate the importance of trade somewhat, because while the production figures are output net of purchases from other industries, export and import figures are gross of such purchases. Since such purchases are more important in goods industries than in service industries, the exaggeration of the importance of trade is greater for goods than for services.

Estimates of U.S. service trade are still a work in progress. A report by the Office of Technology Assessment estimated that exports of services, excluding banking services, were about 60 per cent higher than “Official U.S. Government figures” in 1983 and 1984, and that imports of services were 40-50 per cent higher in those years (U.S. Congress, Office of Technology Assessment, 1986, Table 1). The latest official BEA calculations of service exports

and imports are quite close to the OTA estimates for those years, but somewhat larger for 1984 (Sauers and Pierce, 2005, Table 1).

The path to the much higher revised estimates of trade in services was described in the Appendix to Whichard and Borga (2002). That path began with new legislation in 1984 that permitted BEA to conduct surveys of trade in services. The first benchmark survey was carried out for 1986, and annual follow-up surveys began in 1987. Also, in that year medical service exports were first estimated and primary insurance services were added to previous estimates of reinsurance transactions. Estimates of expenditures by foreign students in the United States and U.S. students abroad started in 1989. In 1990, services were redefined to exclude investment income. In 1992, trade in services between U.S and foreign parents and their affiliates was placed on a gross, instead of a net, basis, increasing both exports and imports of services, coverage of transportation services was increased, and some new services were added to the 1991 benchmark.. Truck transportation services between the United States and Canada were added to the service trade account in 1995. In 1996, BEA began a “Benchmark Survey of Financial Services Transactions Between U.S. Financial Services Providers and Unaffiliated Foreign Persons.” Since then, there have been other improvements in measures of transportation services and reclassifications of software royalties and license fees, leasing of transportation equipment, and compensation of employees, new sources for exports of medical services and imports of travel, and various other items.

One consequence of all these improvements in data collection and expansions in the list of services covered is that historical comparisons over long periods are questionable. The earliest estimates of U.S. service exports included only shipping earnings, and later also port charges on foreign ships, and foreign tourist expenditures in the United States, items that

accounted for perhaps a third of service exports in 2003 (BEA website, <http://www.bea.gov/beahome.html>, downloaded in 2006). The same items, plus estimates of bankers' commissions might cover more of the current imports of services, perhaps a little over half.

Many services in the early United States were performed by foreign companies' agents or by affiliates of foreign firms, which possessed skills not common in the United States at that time. Wilkins (1989) quotes a letter to Alexander Hamilton referring to Virginia to the effect that "The trade of this state is carried on chiefly with foreign (British) capital. Those engaged in it [the trade] hardly deserve the name of merchants, being factors, agents, and Shop-keepers of the Merchants and Manufacturers of Great Britain..." She goes on to say that the passage does not reveal whether these were "...salaried, or partners in the British firms", in which case they might have represented imports of services into the United States, or "...financially independent units that acted for British houses on a purely commission basis" (p. 40), in which case they might have represented U.S. exports of services. Wilkins also reports that America's national banking legislation of 1864-65 "...had not provided a satisfactory basis for the largest American banks to participate in foreign trade financing..." and that as a result, "...to finance much of that trade, American enterprises depended on foreign (mainly British) banking services" (p. 463). Outside of banking, Wilkins notes that "...in 1914, the United States had to rely on foreign-owned shipping, foreign-owned cables, and foreign-owned radio communication" (p. 524). Shipping services were recorded in the balance of payments, but not the others.

Of course, many of the services traded currently, such as telecommunications and film and television tape rentals, did not exist very long ago, but there apparently were many services

that did exist and were not recorded. It is therefore difficult to be sure how much of the apparent trend in the share of service trade in total U.S. trade is genuine.

The definition of residence and trade in educational services

The measurement of trade in more and more services places a great deal of weight on the definition of residence, because the identification of residence can change what is, on the face of it, a domestic transaction into an international transaction. One case in which the attribution of residence changes a domestic demand on a country's resources into an international demand is that of foreign students, who are treated as residents of the country from which they come, with the result that their costs of education and living expenses become a service export of the host country. The service that is simply domestic production and consumption or investment in human capital if a student is a resident of the United States, is an export of educational services if the student is classified as a "foreign resident".

Since many students choose to stay in the host country after their education is completed, the services "exported" to those students' home countries never leave the host countries. The service exports are re-imported when the students become host country residents, an item missed in the balance of payments, or they could be thought of as turning into an import of human capital by the host country, a type of import that is never recorded.

U.S. exports of educational services roughly doubled in value between 1992 and 2004, reaching \$13.5 billion (Nephew et al. 2005), but there are no comprehensive data on what proportion of these service "exports" in fact never leave the United States. A hint that the share staying in the United States might be important is provided by data on intentions to stay expressed by foreign recipients of science and engineering doctorates in the United States. There

are data on “intentions to stay,” and on “definite plans to stay”. Among students from countries accounting for about three quarters of such doctorates between 1985 and 1996, an intention to stay in the United States was expressed by half in 1985, rising to 70 per cent in 1995 and 1996. Among degree recipients from all countries, “plans to stay” were expressed by 68 per cent in 1992-95, 72 per cent in 1996-99, and 74 per cent in 2000-03. A “firm plan to stay,” meaning that the student had accepted a definite offer of a postdoctoral appointment or employment in the United States was reported by from 36 to 46 per cent of the doctoral recipients over 1985 through 1996, and “definite plans to stay” from 35 per cent in 1992-95, to 46 per cent in 1996-99 and 51 per cent in 2000-2003. (National Science Foundation, 1998b and 2006, Appendix Table 2 -33).

The data on plans to stay do not reveal outcomes. Some indication of the fulfillment of these plans is that of about 8,000 temporary residents receiving Science and Engineering doctorates in 1998, over 60 per cent were still in the United States in 2003 (National Science Foundation, 2006, Table 3-24).

Recipients of doctorates were only a small part of the 13 per cent foreign-born share in R&D scientists and engineers in the United States in 1993, although the foreign-born were more important among Ph. Ds than among those with less education. At all degree levels, about two thirds of the foreign-born scientists and engineers employed in the United States had received their training in the United States (National Science Foundation, 1998a, Table 1).

If some substantial part of education exports remains in the United States, there is no clear way to recognize that fact in the current balance of payments framework. What would be required, but does not exist, is some accounting for flows of human capital. The decisions of alien “importers” of U.S. education to settle in the United States would then be treated as an

import of human capital, analogous to the standard flows of financial capital. The re-import of this education would be only a very small part of the imports of human capital via immigration.

The impact of exports of education services may go beyond the tendency of students to stay in the countries where they receive higher education. Even if students do not stay after graduation, they may return as immigrants, carrying back the previously exported education services. One study of immigration found that student flows explained migration to the United States more consistently than "...traditionally highlighted economic variables..." Similar relationships could be observed for migration to a cross-section of OECD countries (Dreher and Poutvaara, 2005, p. 17).

The idea that there is a human capital flow missing from the balance of payments data was suggested a long time ago by Alfred Marshall. "England exports to India a good many able young men: they do not enter in India's list of imports; but it is claimed that they render to her services whose value exceeds that of her total payments to them. They return to England (if they come back at all) after their best strength has been spent: they are unreckoned exports from England. But that part of their incomes, which they have saved, is likely to come back sooner or later in the form of material goods which enter into her imports. On the other hand, India counts those material goods among her exports to England: but of course she makes no entry among her imports for the expensive young men who have been sent to her. (Marshall, 1923, pp.134-135).

Tax havens and trade in services

There is a considerable literature, some of which is summarized in Hines (2005), that describes the effect of low rates of host country taxation in attracting investment and economic activity by multinationals from the United States and probably, even more from other countries. Some of the activity attracted is production, but much of it involves the shifting of income to

avoid or reduce taxes. Hines refers to “an impressive concentration of financial activity in tax havens.” The 30 tax havens he lists accounted in 1999 for 0.7 per cent of the world’s population and 2.1 per cent of world GDP, but for 4.8 per cent of net property, plant, and equipment of U.S. affiliates, 3.4 per cent of employee compensation, and 3.7 per cent of employment. These shares probably represent production taking place in the tax havens and are not of concern in connection with the measurement of their production or export of services. However, these same tax haven affiliates accounted for 15.7 per cent of gross foreign assets of U.S. affiliates, 13.4 per cent of sales, and “...a staggering 30 per cent of total foreign income...” (*ibid.* p. 78). “Much of reported tax haven income consists of financial flows from other foreign affiliates that parents own indirectly through their tax haven affiliates. Clearly, American firms locate considerable financial assets in foreign tax havens, and their reported profitability in tax havens greatly exceeds any measure of their physical presence there” (*ibid.*). Hines goes on to suggest that firms in other countries, such as Germany and the Netherlands, that largely exempt foreign income from taxation, have even stronger incentives to locate investment and income production in tax havens (*ibid.*, p. 79). Desai, Foley, and Hines (2003, p. 68) refer to this flexibility as “...the ability of multinational firms to adjust the reported location of their taxable profits.”

This ability of firms to shift the location of assets and profits by paper transactions internal to the firm makes the location of production ambiguous. That is especially true in industries, such as banking and other financial services, in which production is intangible, but it is also the case in other industries based on intellectual property and even in tangible goods industries in which much of the value of the tangible goods stems from intangible intellectual property. The ambiguity in the location of production produces a corresponding ambiguity in

measures of exports and imports, which involve the movement of goods and services across international borders, ultimately from producers to consumers.

Reported service exports by U.S. affiliates for the world, main regions, and a few selected countries are shown in Table 6, with comparisons to the service exports reported by the same countries, mainly to the IMF. The affiliate “exports” are not reported as exports in the BEA surveys, but as sales by affiliates other than local sales, divided between sales to the United States and sales to other areas outside the host countries. The comparisons are very imprecise for a number of reasons. The U.S. affiliate non-local sales of services are incomplete in several respects. One is that they do not include banking, an important part of service exports worldwide, because the BEA surveys of banks do not include the extensive list of questions asked of non-banking parents and their affiliates. Secondly, the BEA data are confined to majority-owned affiliates, because minority-owned affiliates are not asked the questions about destination of sales. Third, the BEA data are heavily suppressed, with very little country detail available for Caribbean countries that account for much of trade in financial services. That problem could be solved to some extent by making use of the unpublished and confidential data that have been collected by the BEA but cannot be examined outside the BEA.

The data reported by the countries to the IMF have other deficiencies. They lack detail, and more important, several important countries in international trade in services, such as the Cayman Islands and Bermuda, do not report to the IMF at all. However, Bermuda did report exports and imports of services in its national accounts.

For the world as a whole, sales of services outside host countries reported by U.S. affiliates account for less than 10 per cent of aggregate exports of services reported by host countries. In a few cases, the share of U.S. affiliates is much higher. One example is

Switzerland, where they were more than a third in 2002. For western hemisphere countries outside of Central and South America, sales outside the host countries by U.S. affiliates were larger than the aggregate service exports reported by countries in 2002. That was particularly the case for Bermuda's reported service exports in its national accounts (Bermuda did not report to the IMF). In the case of Barbados in 2002, the reported U.S. affiliate service sales outside the host country were 23 per cent larger than the total service exports reported to the IMF.

Within Europe, where much more country detail is available, the notable change between 1999 and 2002 is that the growth of U.S. affiliate sales outside their host countries was, in a number of cases, large relative to country reports to the IMF of increases in service exports. In the Netherlands, U.S. affiliate external sales rose by almost \$3 billion, while service exports reported to the IMF rose by \$6.8 billion. In Switzerland, U.S. affiliate external sales of services increased by \$10 billion, while service exports reported to the IMF rose by less than \$1 billion. And in the United Kingdom, U.S. affiliate external sales grew by over \$11 billion, while service exports reported to the IMF increased by \$14 billion. Those high U.S. affiliate external sales figures suggest, at a minimum, that there are differences between what the host countries think their service exports are and what the affiliates consider their external sales of services.

Table 6: Exports of Services Reported by US Firms' Affiliates and by Host Countries (\$US, Millions)

	1999		2002	
	Sales by Nonbank Majority-owned Affiliates to US and Other Foreign Countries	Exports of Services Reported by Host Countries	Sales by Nonbank Majority-owned Affiliates to US and Other Foreign Countries	Exports of Services Reported by Host Countries
All countries³	52,167	1,157,049	92,890	1,347,677
Canada	2,482	36,117	2,811	39,759
Europe⁹	27,639	728,272^h	58,934	848,517^h
Ireland	1,577	15,688	2,917	29,901
Netherlands	2,715	49,210	5,578	56,011
Switzerland	648	29,277	10,643	30,305
United Kingdom	12,440	118,613	23,652	132,990
Latin America and Other Western Hemisphere	11,652	54,707^{a,b}	14,607	58,294^{a,b}
Central & South America ⁵	1,883	41,042 ^b	1,810	44,040 ^b
Other Western Hemisphere ⁶	9,769	13,665 ^a	12,797	14,254 ^a
Barbados	(D)	1,029	1,282	1,041
Bermuda	6,311	1,486	(D)	1,603
United Kingdom Islands, Caribbean ¹	881	n. a.	1,540	n. a.
Western Hemisphere, n.e.c. ²	(D)	8,300 ^a	(D)	8,539 ^a
Bermuda & Western Hemisphere, n.e.c. ²	(D)	9,786 ^a	9,975	10,142 ^a
Barbados & Western Hemisphere, n.e.c. ²	2,577	9,329 ^a	(D)	9,580 ^a
Middle East⁷	586	24,656^e	512	27,609^e
Other Middle East ⁴	(D)	7,585 ^c	(D)	11,161 ^d
Asia Pacific⁸	8,899	273,331^f	14,740	327,110^g
China	118	26,248	460	39,745
Hong Kong	1,536	35,625	2,060	44,601
Singapore	1,562	26,373	1,379	30,833

Note:

1. "United Kingdom Islands, Caribbean" refers to British Antilles, British Virgin Islands, Cayman Islands, Montserrat.
 2. "Western Hemisphere, n.e.c." refers to Anguilla, Antigua and Barbuda, Aruba, Bahamas, Cuba, Dominica, French Islands, (Caribbean), Grenada, Haiti, Jamaica, Netherlands Antilles, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, United Kingdom Islands (Atlantic).
 3. US is excluded.
 4. "Other Middle East" refers to Bahrain, Iran, Jordan, Kuwait, Lebanon, Oman, Qatar, Syria and Yemen.
 5. Central America refers to Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama; South America, refers to Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay, Venezuela.
 6. "Other Western Hemisphere" refers to Barbados, Bermuda, Dominican Republic, United Kingdom Islands (Caribbean) and Western Hemisphere, n.e.c..
 7. "Middle East" includes Israel, Saudi Arabia, United Arab Emirates and Other Middle East.
 8. "Asia Pacific" includes Australia, Bangladesh, Bhutan, Brunei, Burma, Cambodia, China, Fiji, French Islands (Indian Ocean), French Islands (Pacific), Hong Kong, India, Indonesia, Japan, Korea, Laos, Macau, Malaysia, Marshall Islands, Micronesia, Nauru, Nepal, New Zealand, Pakistan, Papua New Guinea, Philippines, Samoa, Singapore, Sri Lanka, Taiwan, Thailand, Tonga, Vanuatu, Vietnam.
 9. "Europe" include Albania, Andorra, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia & Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Gibraltar, Greece, Greenland, Hungary, Iceland, Ireland, Italy, Kazakhstan, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Moldova, Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Turkmenistan, Ukraine, United Kingdom and Uzbekistan.
 - a. Data include all the countries in "Western Hemisphere, n.e.c." except Cuba, French Islands (Caribbean) and United Kingdom Islands (Atlantic).
 - b. French Guiana is excluded.
 - c. Data for Lebanon and Qatar are not available.
 - d. Data for Iran and Qatar are not available.
 - e. United Arab Emirates are not available.
 - f. Data exclude Bhutan, Brunei, Macau, French Islands (Indian Ocean), French Islands (Pacific), Marshall Islands, Micronesia, Nauru, and Tonga.
 - g. Data exclude Bhutan, Brunei, Macau, Fiji, French Islands (Indian Ocean), French Islands (Pacific), Laos, Marshall Islands, Micronesia, Nauru, Papua New Guinea, Samoa, and Tonga.
 - h. Data exclude Andorra, Gibraltar, Greenland, Liechtenstein, Serbia, Turkmenistan, and Uzbekistan.
- (D): refers to the suppression of data.

Source:

1. Nonbank Majority-owned Affiliates Sales are from US Department of Commerce, Bureau of Economic Analysis, www.bea.doc.gov
2. Exports of Services Reported by Host Countries are from IMF (2006).
3. Exports of Services Reported by Host Countries for Bermuda in 1999 are from United Nations (2002).
4. Exports of Services Reported by Host Countries for Bermuda in 2002 are from website of Statistics Department of Bermuda, www.statistics.gov.bm downloaded on April 10, 2006.

Table 7 gives some hints about the characteristics of U.S. affiliates in various host countries and what their peculiarities are. Affiliates in the area called “Other Western Hemisphere,” essentially islands in the Caribbean, own enormous assets relative to their labor input, measured by employment or employee compensation. For example, while the average ratio around the world is about \$700,000 per employee, the ratios in the three European countries shown are all over \$1.7 million per employee and those for affiliates in “Other Western Hemisphere” are \$9 million per employee. Within that group, affiliates in Bermuda had assets of over \$16 million per employee and those in the UK Islands in the Caribbean, \$28 million per employee. While worldwide, U.S. affiliates owned assets 21 times their payrolls, those in “Other Western Hemisphere” had assets over 300 times their payrolls. Their activities appear to be very capital-intensive types of production.

Of course, capital/labor ratios could differ across countries because the industry composition of production is different. In some cases, it is possible to compare capital/labor

Table 7: Ratios of Total Assets to Other Input Measures: US Affiliates in All Industries, 1999

	Ratios of Total Assets ³ to			
	Sales	Net Income	Employment ³	Compensation of Employees
All countries	2.4	34	696	21
Canada	1.3	25	360	11
Europe	2.6	34	941	22
Ireland	1.7	8	1,010~2,020	(D)
Netherlands	2.2	16	1,710	37
Switzerland	2.1	14	2,131	31
United Kingdom	5.2	75	1,784	38
Latin America and Other Western Hemisphere	3.3	36	556	34
Central & South America	1.8	32	253	16
Other Western Hemisphere	10.3	39	9,375	335
Bermuda	7.6	19	32,574~16,287	(D)
UK Islands, Caribbean ¹	16.8	63	28,157	462
Western Hemisphere, n.e.c. ²	11.4	161	8,233~4,116	(D)
Middle East	3.0	31	1,078	25
Other Middle East ⁴	7.0	45	3,967	100
Asia Pacific	2.0	38	563	20
China	1.4	33	112	17
Hong Kong	2.8	31	1,357	35
Singapore	1.8	35	1,204	37

1. "United Kingdom Islands, Caribbean" comprises British Antilles, British Virgin Islands, Cayman Islands, Montserrat.

2. "Western Hemisphere, not elsewhere classified" refers to Anguilla, Antigua and Barbuda, Aruba, Bahamas, Cuba, Dominica, French Islands (Caribbean), Grenada, Haiti, Jamaica, Netherlands Antilles, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, United Kingdom Islands (Atlantic).

3. Thousands of dollars per employee.

4. "Other Middle East" refers to Bahrain, Iran, Jordan, Kuwait, Lebanon, Oman, Qatar, Syria and Yemen.
(D): refers to the suppression of data.

Source:

US Department of Commerce, Bureau of Economic Analysis, www.bea.doc.gov, downloaded on Sept. 23rd, 2005.

ratios within broad industries. Tables 8 and 9 show the ratios for Depository Institutions and for Finance (except depository institutions), and Insurance. In the case of depository institutions, in which the worldwide average assets per employee in U.S. affiliates was \$10 million, U.S. affiliates in “Other Western Hemisphere” owned \$117 million of assets per employee. Their assets were more than 2,000 times their employee compensation, as compared with about 150 times employee compensation worldwide (Table 8).

In Other Finance and Insurance, U.S. affiliates worldwide owned \$6.6 million in assets per employee while those in Switzerland owned assets of over \$22 million per employee, those in Bermuda, almost \$28 million per employee, and those in “Other UK Islands,” over \$60 million per employee. Worldwide, U.S. affiliates in this industry owned assets almost 100 times their payrolls, but those in Switzerland had assets 175 times their payrolls and those in “Other Western Hemisphere,” assets 300 to 400 times their payrolls (Table 9).

The data for the two finance sectors make it clear that the loading of assets on to U.S. affiliates in Switzerland and the Caribbean is not simply a result of the industry composition of investment in those countries, but represents a choice by parent companies in financial service industries to attribute assets to these locations.

Table 8: Ratios of Total Assets to Other Input Measures: US Affiliates in Depository Institutions, 1999

	Ratios of Total Assets ³ to			
	Sales	Net Income	Employment ³	Compensation of Employees
All countries	20.0	503	10,245	168
Canada	14.5	280	2,744	106
Europe	24.0	366	11,766	147
Ireland	21.2	50	3,570~8,922	(D)
Netherlands	(D)	(D)	(D)	(D)
Switzerland	14.4	60	6,970	55
United Kingdom	29.9	1,636	20,080	195
Latin America and Other Western Hemisphere	17.2	-694	12,013	264
Central & South America	5.9	42	2,394	53
Other Western Hemisphere	30.2	-141	117,367	2,347
Bermuda	0	0	0	0
UK Islands, Caribbean ¹	41.5	-76	153,283	1,703
Western Hemisphere, n.e.c. ²	(D)	(D)	(D)	(D)
Middle East	17.2	227	16,593	215
Other Middle East ⁴	(D)	(D)	(D)	(D)
Asia Pacific	17.3	277	7,434	155
China	19.2	-43	8,653	288
Hong Kong	14.6	188	6,402	130
Singapore	20.4	-955	15,921	195

1. "United Kingdom Islands, Caribbean" comprises British Antilles, British Virgin Islands, Cayman Islands, Montserrat.

2. "Western Hemisphere, not elsewhere classified" refers to Anguilla, Antigua and Barbuda, Aruba, Bahamas, Cuba, Dominica, French Islands (Caribbean), Grenada, Haiti, Jamaica, Netherlands Antilles, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, United Kingdom Islands (Atlantic).

3. Thousands of dollars per employee.

4. "Other Middle East" refers to Bahrain, Iran, Jordan, Kuwait, Lebanon, Oman, Qatar, Syria and Yemen.

(D): refers to the suppression of data.

Source:

US Department of Commerce, Bureau of Economic Analysis, www.bea.doc.gov, downloaded on Sept. 23rd, 2005.

**Table 9: Ratios of Total Assets to Other Input Measures:
US Affiliates in Finance (except Depository Institutions) and Insurance, 1999**

	Ratios of Total Assets ³ to			
	Sales	Net Income	Employment ³	Compensation of Employees
All countries	11.2	79	6,637	97
Canada	(D)	(D)	(D)	(D)
Europe	15.0	103	11,131	121
Ireland	14.8	36	15,089	268
Netherlands	(D)	(D)	(D)	(D)
Switzerland	18.2	89	22,222	175
United Kingdom	17.0	119	13,608	121
Latin America and Other Western Hemisphere	7.8	35	5,015	137
Central & South America	6.5	(D)	1,488	50
Other Western Hemisphere	(D)	(D)	(D)	378
Bermuda	8.5	29	27,725	398
UK Islands, Caribbean ¹	18.5	72	63,540	304
Western Hemisphere, n.e.c. ²	(D)	(D)	(D)	(D)
Middle East	(D)	(D)	(D)	(D)
Asia Pacific	(D)	(D)	3,334	51
China	(D)	(D)	489~978	(D)
Hong Kong	(D)	(D)	4,342	30
Singapore	(D)	(D)	(D)	(D)

1. "United Kingdom Islands, Caribbean" comprises British Antilles, British Virgin Islands, Cayman Islands, Montserrat.

2. "Western Hemisphere, not elsewhere classified" refers to Anguilla, Antigua and Barbuda, Aruba, Bahamas, Cuba, Dominica, French Islands (Caribbean), Grenada, Haiti, Jamaica, Netherlands Antilles, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, United Kingdom Islands (Atlantic).

3. Thousands of dollars per employee.

(D): refers to the suppression of data.

Source:

US Department of Commerce, Bureau of Economic Analysis, www.bea.doc.gov, downloaded on Sept. 23rd, 2005.

The assets producing the sales by U.S. affiliates, in countries where the ratio of assets to labor inputs is particularly high, are not primarily physical assets, as can be seen from Table 10. The worldwide ratio of total assets to net property, plant, and equipment in U.S. nonbank affiliates was 5.6 in 1999, but the ratio in the Netherlands was almost 14, in Switzerland, 23, in Bermuda, 27, and in UK Islands in the Caribbean, 34. Most of the assets of these asset-rich affiliates were financial assets or intellectual property. It would be hard to define the location of these assets, and if they are the basis for most of the output of these affiliates, one could say that only statistical convention places that output in these affiliates' host countries.

**Table 10: Ratio of Total Assets to Net Property, Plant and Equipment
by Nonbank Affiliates of Nonbank US Parents, 1999**

	Ratio of Total Assets to Net Property, Plant and Equipment
All countries	5.65
Canada	4.22
Europe	7.44
Ireland	10.78
Netherlands	13.95
Switzerland	23.20
United Kingdom	8.59
Latin America and Other Western Hemisphere	4.66
Central & South America	3.11
Other Western Hemisphere	15.40
Barbados	(D)
Bermuda	27.57
United Kingdom Islands, Caribbean ¹	34.33
Western Hemisphere, n.e.c. ²	4.04
Bermuda & Western Hemisphere, n.e.c. ²	13.10
Middle East	2.19
Other Middle East ³	1.49
Asia Pacific	4.56
China	2.90
Hong Kong	7.86
Singapore	7.02

1. "United Kingdom Islands, Caribbean" comprises British Antilles, British Virgin Islands, Cayman Islands, Montserrat.

2. "Western Hemisphere, not elsewhere classified" refers to Anguilla, Antigua and Barbuda, Aruba, Bahamas, Cuba, Dominica, French Islands (Caribbean), Grenada, Haiti, Jamaica, Netherlands Antilles, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, United Kingdom Islands (Atlantic).

3. "Other Middle East" refers to Bahrain, Iran, Jordan, Kuwait, Lebanon, Oman, Qatar, Syria and Yemen.
(D): refers to the suppression of data.

Source: US Bureau of Economic Analysis (2004).

Table 11 displays the “profit-type return” relative to labor compensation, for those affiliates that are not only nonbank, but also majority-owned for both 1999 and 2002. Profit-type return “...measures profits before income taxes, and it excludes nonoperating items (such as special charges and capital gains and losses) and income from equity investments.” (U.S., Bureau of Economic Analysis, 2004, p. M-19). These ratios are clearly related to the asset/labor ratios of Table 7. While the worldwide ratios of “profit-type return” to payrolls were 56 and 57 per cent in the two years, those for Ireland were 400 and 572 per cent , and those for “Other Western Hemisphere were over 600 per cent in both years. They were around 1300 per cent for affiliates in Bermuda, 3000 to 5000 per cent for those in Barbados, and well over 1000 per cent in UK Islands and other countries in the Caribbean area. The extremely high ratios of capital to labor income are achieved by attributing large amounts of capital to the affiliates in these countries.

**Table 11: Ratio of Profit-type Return to Compensation of Employees
by Majority-owned Nonbank Affiliates of US Nonbank Parents**

	1999	2002
	Ratio of Profit-type Return to Compensation of Employees	Ratio of Profit-type Return to Compensation of Employees
All countries	0.557	0.568
Canada	0.586	0.489
Europe	0.439	0.449
Ireland	3.964	5.720
Netherlands	0.793	0.590
Switzerland	0.867	0.991
United Kingdom	0.333	0.238
Latin America and Other Western Hemisphere	0.771	0.618
Central & South America	0.466	0.273
Other Western Hemisphere	6.161	6.231
Barbados	30.884	51.781
Bermuda	13.007	12.889
United Kingdom Islands, Caribbean ¹	4.249	2.074
Western Hemisphere, n.e.c. ²	1.655	3.706
Bermuda & Western Hemisphere, n.e.c. ²	6.714	7.735
Barbados & Western Hemisphere, n.e.c. ²	4.798	6.904
Middle East	1.084	1.608
Other Middle East ³	5.887	8.629
Asia Pacific	0.755	0.861
China	0.670	1.216
Hong Kong	0.898	0.898
Singapore	1.420	1.493

1. "United Kingdom Islands, Caribbean" comprises British Antilles, British Virgin Islands, Cayman Islands, Montserrat.

2. "Western Hemisphere, not elsewhere classified" refers to Anguilla, Antigua and Barbuda, Aruba, Bahamas, Cuba, Dominica, French Islands (Caribbean), Grenada, Haiti, Jamaica, Netherlands Antilles, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, United Kingdom Islands (Atlantic).

3. "Other Middle East" refers to Bahrain, Iran, Jordan, Kuwait, Lebanon, Oman, Qatar, Syria and Yemen.

Source:

1. US Bureau of Economic Analysis (2004).

2. US Department of Commerce, Bureau of Economic Analysis, www.bea.doc.gov, downloaded on Sept. 23rd, 2005.

In the case of one service imported into the United States, insurance services, data are available for imports in recent years from all sources, not only U.S. affiliates (Table 12). U.S. imports of insurance services increased rapidly between 2001 and 2003, by more than half. The tiny islands of the Caribbean, containing a negligible fraction of the world's population, were responsible for over half of U.S. imports of insurance services in 2001 and almost half in 2003. Extreme specialization is not impossible, but it is hard to think of what resources in these islands are producing all these services.

While the allocation of financial assets to low tax countries is the most common distortion of the location of production, and along with production, exports and imports, other intangible assets are subject to similar manipulation and the creation of phantom flows of trade.. In 1997, Microsoft made a major allocation of intellectual property to an Irish subsidiary, which collects licensing fees from Microsoft sales to many other countries and, in the process, "...helps the computer giant shave at least \$500 million from its annual tax bill" (Wall Street Journal, November 7, 2005, p. 1). The subsidiary has "...a thin roster of employees..." and the software was mostly developed outside Ireland, but the subsidiary "...controls more than \$16 billion in Microsoft assets" (*ibid.*).

Table 12: US Payments for Imports of Insurance Services, 2001-2004 (\$US, Millions)

	2001	2002	2003	2004
All countries	16,706	22,150	26,561	29,882
Canada	343	554	501	644
Europe	7,121	11,915	13,541	12,051
Netherlands	110	142	166	39
Switzerland	1,232	2,316	2,601	3,104
United Kingdom	2,978	3,848	4,980	3,488
Latin America and Other Western Hemisphere	9,082	9,462	12,294	16,952
Other Western Hemisphere	9,032	9,383	12,242	16,880
Bermuda	7,167	7,499	10,215	12,319
Western Hemisphere, n.e.c. ¹	1,867	1,884	2,028	4,561
Africa	2	4	1	22
Middle East	4	3	5	4
Asia and Pacific	132	205	205	209

1. " Western Hemisphere, not elsewhere classified" refers to Anguilla, Antigua and Barbuda, Aruba, Bahamas, Cuba, Dominica, French Islands (Caribbean), Grenada, Haiti, Jamaica, Netherlands Antilles, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, United Kingdom Islands (Atlantic).

Source:

Borga and Mann (2004).

Nephew, Koncz, Borga and Mann (2005)

Publicly available data do not report individual company transactions, but this one, perhaps in combination with similar moves by other firms, made its mark in a number of places in aggregate data. It is difficult to compare 1994 and 1999 BEA numbers by industry because of the shift from the SIC to NAICS industry classifications, but this and similar transactions may have figured in the more than tenfold growth over that period in the sales of U.S. affiliates in Ireland classified as “Electronic and Other Electric Equipment” or “Services” in 1994 or as “Computers and Electronic Products” or “Professional, Scientific and Technical Services” in 1999, from \$2.5 billion to \$26 billion (U.S. Bureau of Economic Analysis, 1998 and 2004). There was a considerable growth in employment also, but only from 14 thousand to 36 thousand (*ibid.*).

Ireland as a country reported a major growth in exports of services the year after Microsoft’s move. Exports of “Other Services” jumped from \$US 2.3 billion in 1997 to \$US 11.6 billion in 1998, of which exports of Computer and Information Services (not reported before 1998) were \$US 5.3 billion (IMF, 2006). It appears that Ireland’s exports of “Other Services” before 1998 was composed only of royalties and license fees, government services, n.i.e., and “Other business services”. The fact that there was no decline in the last category in 1998, when reports for five new service exports were added, suggests that they were not included in this category before that data, and were probably not estimated at all.

Software is not the only corporate asset subject to international shifting for tax purposes. One news article on such shifts referred to “...patents on drugs, ownership of corporate logos, techniques for manufacturing processes and other intellectual assets ...” and quoted a tax lawyer as calling such moves routine, “ ‘international tax planning 101’”. He added that “ ‘most of the assets that are going to be relocated as part of a global repositioning are intellectual

property...that is where most of the profit is. When you buy a pair of sneakers for \$250, it's the swoosh symbol, not the rubber', you pay for". ("Key Company Assets Moving Offshore," New York Times, Nov. 22, 2002).

Phantom flows are not confined to the services trade account, although they are more important there than in goods trade. For example, trade statistics have long shown exports of ships to Panama, Honduras, and Liberia, "flags of convenience," which became the Pan-Hon-Lib (or PHL) fleet. These ships were counted in trade statistics as exports to those countries because the ships were registered there, but they may never have crossed the borders of the three countries and were never owned by firms located there. The ships were owned "mainly by residents of the United States, the United Kingdom, and the Continent" (Woolley, 1966, p.43).

The amounts of this trade were substantial. In the 1960s, Liberia was the only country of the three to which exporters reported significant exports of ships, always less than \$1 billion per year, but by the 1990s, reported exports of ships to Liberia were running at \$3 - 4 billion per year, and exports to Panama were \$8-9 billion per year (NBER- UN World Trade Data Base).

While exporting countries reported total exports of goods to Liberia of \$13.6 billion between 1982 and 1987, Liberia reported total imports of only \$1.9 billion to the IMF (IMF 2006). Most of the difference was accounted for by \$10.2 billion of exports of ships to Liberia reported by exporting countries but never entered into Liberia's balance of payments data, presumably because the ships never entered Liberia and were never owned by residents of Liberia. Panama had an even larger registered fleet that never crossed the country's borders, to judge by the trade data. Total exports to Panama reported by exporters amounted to \$169.5 billion from 1984 through 2000, while goods imports reported by Panama to the IMF totaled

\$82.8 billion over the same period. The difference was more than accounted for by \$94.5 billion in reported exports of ships, not recognized as imports by Panama.

These fleets created corresponding problems for the service accounts. According to Karreman (1961), “The earnings and disbursements of vessels flying the flags of Panama, Honduras, and Liberia are not reported at all by those countries, since they ‘do not consider the vessels as part of their economy.’ Among reasons for registering ships under those flags... is that those countries do not demand financial statements... and do not levy taxes on the companies that own the ships. Another reason is that those three countries do not keep a close watch on labor conditions prevailing on board those ships” (p. 27).

The Definition of Residence: What does the Current Account Balance Measure ?

The Review Committee for Balance of Payments Statistics (1965) suggested that “balance of payments data are peculiarly elusive” because, “The basic criterion for a balance of payments transaction is that it is between a domestic and a foreign ‘resident.’...The application of this set of concepts to concrete situations may involve subtle distinctions, and it is often difficult to determine residence even when all the facts are known....Distinctions based on the balance of payments concept of residence have not ordinarily been important in the affairs of business firms, governments, or households; the concept, therefore, is not normally reflected in their records. The balance of payments statistician seeking data on international transactions from these records finds himself asking questions that are likely to be new and alien to the company’s or the agency’s normal way of thinking.” (pp. 16-17).

As the importance of intangible assets has grown, particularly for the United States, it may no longer be true that questions of residence are new or alien to the thinking of companies,

but the way they have become familiar to companies is different from the way that economists think of them. For companies, issues of residence, or the location of intangible assets, are important as tools for minimizing taxes, and companies can manipulate the residence of assets in ways that do not fit with economists' concepts of trade and production.

What are the economist's concepts of trade and the current balance? Meade (1951, p. 34) defined exports as an element of "...demands for goods and services which directly or indirectly cause a demand for factors of production (i.e. for the productive services of land, capital, enterprise and work)..." whose incomes are recorded in the national income. Imports, correspondingly, lead to a demand for "...the productive resources of other countries."

If we interpret that criterion as requiring that exports use the factors of production physically located in a country, several aspects of current practice appear to contradict it. An example is the treatment of firms "...organized in the United States and controlled by U.S. interests, but operating abroad" as U.S. residents (U.S. Department of Commerce, 1990, pp. 3-4). The same is true of the treatment as domestic production, a source of exports, of production "...undertaken by a resident even though the physical process takes place outside the economic territory." (IMF, 1993, p. 23.)

If the object in the balance of payments is not to measure the physical movement of goods or services, and trade in services does not involve a change in ownership, what is the goal of the measurement? Writings about the balance of trade, and particularly about the balance of payments, have often had a whiff of mercantilism about them. That used to be especially clear in the references to "favorable" or "unfavorable" balances. These terms have virtually disappeared, but they reflected the traditional purpose of the calculations, which was to know whether a country was gaining or losing gold. In an international regime aiming at stability of exchange

rates, the substitute was the question of demand for and supply of a country's currency. One reflection of that aim was the effort to define "autonomous" and "accommodating" transactions, as in Meade (1951, pp. 11-16). In the United States, there was a search for the appropriate measure of balance-of-payments deficits or surpluses, the need for which stemmed from the fact that "Leading countries have established fixed parities for their currencies and have undertaken to maintain exchange rates within prescribed margins of those parities" (Review Committee for Balance of Payments Statistics, 1965, p. 2). That purpose too has become obsolete. The Bureau of Economic Analysis, describing concepts underlying the balance of payments in 1990, does not provide a purpose for the calculation, but defines it simply as "...a statistical summary of international transactions...defined as the transfer of ownership of something that has an economic value measurable in monetary terms from residents of one country to residents of another" (U.S. Department of Commerce, 1990, p. xiii). The article explaining alternative frameworks for the international accounts (Landefeld, Whichard, and Lowe, 1993) refers to the "standard balance of payments" as providing "...indicators of returns to domestic versus foreign factors of production..." (p. 51), echoing Meade's description.

A more recent textbook defines a country's current account balance as "...the change in the value of its net claims on the rest of the world- the change in its net foreign assets" (Obstfeld and Rogoff, 1996, p. 4). The issue of residence remains. An intangible asset has no real geographical location; its only definite location is its ownership. A multinational corporate owner can choose to assign the ownership of an intangible asset to an affiliate anywhere in the world. By moving a piece of paper from one pocket to another, the firm changes the apparent geographical location of an asset, of production from that asset, and the direction of trade flows from its output. Production that had been taking place in the home country now takes place in

the country of assignment of the asset. The home country, or other former nominal location of the asset, which had been credited with its output, is now reported to be importing that output. Has anything really happened? Can we accept that there has been a change in the reality we are trying to measure, or are we being fooled into thinking that some economic event has taken place when it has not?

Since transfer of ownership from residents of one country to residents of another country defines trade, the definition of residence is crucial. That definition gives rise to many of the problems in measuring trade in services discussed above. The effects of the definition of residence are broader than the balance of payments, extending to the measurement of national income and product. If income and product are measured from the product, or final use side, the definition of residence determines which transactions enter the balance of payments. If income and product are measured from the income side, the definition of residence determines the geographical allocation of net profits of firms operating in multiple locations.

The issue for income and product accounts is illustrated in the calculation of sub-national income and product aggregates. In the United States, this has usually been done from the income side, avoiding the need to measure exports and imports of states, for example. The problem is then faced in the allocation of profits. In one of the earliest such attempts, for 1919 (Knauth, 1923), the issue gets short shrift, after a brief comment that “The corporate surplus in 1919...is a difficult item to distribute among the states.” The solution proposed was to distribute it in proportion to value added in manufacturing. That was intended to be a rough approximation to a distribution by the location of production. A slightly later estimate (Leven, 1925) attempted to distribute entrepreneurial and property income by the distribution of the recipients of the income.

The current BEA estimates of Gross State Product, most fully described in Friedenber and Beemiller (1997), are still based on the income side of the accounts, and therefore do not have to estimate exports and imports to and from each state, but still suffer to some extent from the uncertainty about the location of the output reflected in the nonwage part of value added. However, the basic sources of data are available on an establishment basis for most industries, and the BEA appears to believe that using establishment data at least reduces the ambiguity about where the production corresponding to the value added takes place. The greater the importance of production from intangible assets, the less one can learn from using establishment data.

In the cases of international service trade based on intangible assets, if the assets producing these services are exported to some countries by simply placing them on the books of the affiliates incorporated there, what local resources are used in producing these services? What is the flow of services from these exporters that is equivalent to the flow of goods measured in the goods trade accounts? What would be the significance to the U.S. economy of a rise in the deficit from these imaginary international flows?

If there are what appear to be large distortions in the service trade data, or extreme flexibility in assigning production of services to locations, they raise questions about the meaning and purpose of the balance of payments accounts. Procedures for measurement are often justified by conformity with IMF manuals and the SNA, without much discussion of the underlying purposes of the measurement. And they rarely discuss the implications, if any, of moving from a world in which production and trade consist mostly of goods to a world in which most production is in the form of services, and the implications of moving from a world in which production within a firm is located in a firm's home country to a world in which production

within a firm combines inputs located in many countries or worse, inputs with no definite geographical location.

The issue here is not what tax havens and the shifting of assets do to home and host country tax revenues. The focus is on the tiny tax havens because some of them have so little production outside of tax avoidance activities that it is relatively clear what is going on there. However, much the same problem in measuring flows of services must exist, more hidden, in larger countries. The question is whether we are, by our ways of measuring, creating phantom international flows of some services that may not be crossing international borders at all. Services that are produced and consumed entirely within the United States without crossing borders may appear to be imported into the United States and exported from some Caribbean Island. What do we learn about the economy of the United States or of the “exporting country” from observing these phantom flows?

Various ways have been suggested for incorporating production by foreign affiliates into international accounts by producing accounts on what is referred to as an “ownership” rather than a “residency” basis. While these accounts are not intended as replacements for the standard balance of payments accounts, and some of them are intended for different purposes, such as measuring the shares of world sales or production controlled by a country’s firms, they sometimes do, in the process, escape from counting transactions that do not really take place by combining the operations of parent firms with those of their foreign affiliates. Several papers (Lipsev and Kravis, 1985, 1987, and 1992 and Blomström and Lipsey, 1989 and 1993) attempted to measure and explain shares in world exports of firms based in the United States and Sweden, combining the exports of parent firms with those of their foreign affiliates. Recalculations of the payments balance along ownership, rather than geographical lines were suggested by DeAnne

Julius (1990), and by a National Research Council panel (National Research Council, Panel on Foreign Trade Statistics, 1992) and carried out for the United States in Baldwin and Kimura (1998) and for Japan in Kimura and Baldwin (1998). The Bureau of Economic Analysis now regularly publishes an ownership-based current account for the United States, explained in Landefeld, Whichard, and Lowe (1993). The latest of these is U.S. Bureau of Economic Analysis (2006).

The common feature of these alternative measures is that they are based on the ownership of the productive resources or of the firms in which production takes place, rather than the location of the resources. In this way, they net out the effects of some of what I have described as phantom transactions in the ownership-based accounts, although they do not remove them from the standard accounts. For example, the transfer of intangible assets to a shell foreign affiliate would, in the BEA ownership-based accounts, still reduce the service exports of the United States, but that reduction would presumably be offset by an increase in the sales by foreign affiliates, from which purchases by the affiliates from the United States and payments to foreign factors of production would be subtracted. Similarly, increased purchases of insurance services from shell re-insurance affiliates in the Caribbean would still appear in imports of services, but the negative effect on the current balance would be offset, again, by increases in export sales by foreign affiliates.

The calculations by Baldwin and Kimura are more focused on the ownership of production, adding the production, or value added, by U.S. affiliates abroad to production in the United States by U.S.-owned firms. They do not subtract the payments to foreign labor by U.S. affiliates, as the BEA calculations do, since those payments are part of the value added under the control of U.S. firms, even though they are payments for resources resident abroad. However,

this calculation washes out the effects of our “phantom” transactions, as the BEA calculation does. The transfer of intangible assets to a U.S. affiliate overseas does not move the production from that asset out of the U.S. firm, even though it moves it geographically.

Given the ease with which the nominal location of production, imports, and exports from intangible assets can be manipulated, the path of these variables might be better represented by consistently attributing them to parent companies, the ultimate beneficial owners, in BEA terminology.

Summary and Conclusions

Trade in services is more difficult to define and measure than trade in goods, and as a consequence, its size and growth are much less certain. A world total in recent years of a little under \$2,000 billion, is the reported value, approximately one quarter of world trade in goods. The trend in the importance of services trade is even harder to guess, because the number of services measured and the number of countries measuring service trade has increased, especially since 1975. Despite those increases, there is only slight evidence of a rise in the importance of service trade relative to goods trade.

Since the United States has been a leader in measuring service trade, the data are more complete than those for the world. Service exports have recently been over 40 per cent of goods exports, while service imports have been only about 20 per cent of goods imports, but service imports have been growing much faster than service exports in the last five years. The current large importance of services in U.S. exports is not unprecedented. Service exports were about 30 per cent of goods exports in the first three decades of the existence of the United States. They fell to low levels (5 per cent or less of goods exports) at the end of the 19th Century and the beginning of the 20th, and have been rising since then.

Relative to goods and services output, service exports and imports are much smaller than goods exports and imports, especially the imports. Service exports and imports are about 5 per cent of services output, while goods imports are over a third of goods output and goods exports are over 20 per cent of goods output. Both goods and services exports are at historically high levels relative to output, compared to the period since 1869, and the same is true for goods imports, which have risen steadily since 1950 after a long secular decline from 1869 to World War II. Changes in services imports relative to services output have been much smaller, and the ratio for 2000-2005 is not very different from that for 1869-73.

The measures of service trade, because they are not anchored in any observation of physical movement, are, much more than those of goods trade, determined by the definition of residence, since residence, rather than an observed movement of a final product, determines what is an export or import. The problem is illustrated by the case of trade in educational services, because the determination that an ostensibly domestic transaction is an import or export rests on a difference in residence between the provider and the acquirer of the service. A paradoxical aspect of this definition is that, especially in the United States, much of the “exported” educational service never leaves the United States because the recipients decide to become U.S. residents. What would be necessary to close this gap between the service trade measure and reality would be an account for flows of human capital which would show the service imported into the United States in the form of human capital. An alternative would be to treat the educational expenditure as an internal trade within the United States until the recipient crossed the border to return home, if he or she did so, and then enter it into exports of services. A drawback of this scheme is that it would not account for the re-import of previously exported services when the recipient of a U.S. education returned to the United States at a later date.

The most serious problem for the measurement of service trade is the expanding use of the placement of intangible assets by parent firms in low tax jurisdictions. Since the assets are intangible, including financial assets, patents, trade marks, rights to designs, corporate logos, they have no particular geographical location, and can be attributed by the parent company of a multinational to any of its affiliates. The result is that the output and exports stemming from these assets can also be attributed to geographical locations almost at will, subject to some limited regulation by tax authorities, without any relation to the actual location of any physical aspect of the production. A large part of service production, exports, and imports can begin to consist of “phantom” production and trade that makes no use of factors of production actually resident in the countries to which they are attributed. If that takes place to an important degree, the measures of the current balance and national income and output begin to lose their meaning.

Some evidence of the effects of shifts in residence of assets is available for the United States, because the data are most complete, but the same phenomena must affect the data for other countries. Furthermore, they are not confined to service trade, but affect measures of goods trade as well. The only solution that seems feasible is to consolidate the operations of multinational parents and their affiliates in the data, attributing all operations to the parent country, and counting as trade only transactions outside the multinational firm, between segments of the firm and unaffiliated entities. The closest approximation to this is the “ownership-based” accounts of the BEA, but these are not incorporated into the international transactions accounts or national accounts in general. Perhaps it is time to take the ownership accounts more seriously.

Appendix

Appendix Table A: Service Exports and Imports as Percent of Goods Exports and Imports

Year	22 Countries ^a		30 Countries ^b	
	Exports	Imports	Exports	Imports
1972	24.25	27.06	n.a.	n.a.
1973	22.12	25.17	n.a.	n.a.
1974	18.77	21.39	n.a.	n.a.
1975	20.69	24.17	n.a.	n.a.
1976	21.19	23.80	n.a.	n.a.
1977	21.46	23.55	22.21	24.09
1978	22.21	24.20	22.93	24.89
1979	20.78	24.24	21.70	24.45
1980	20.13	23.81	21.36	24.05
1981	20.75	25.20	21.88	25.75
1982	23.13	26.60	23.46	26.42
1983	23.92	26.16	23.65	26.27
1984	23.24	24.48	22.68	24.91
1985	23.82	24.23	22.97	24.54
1986	25.32	24.79	23.86	25.56
1987	25.41	24.70	24.28	25.86
1988	24.21	24.19	23.38	25.85
1989	24.36	24.11	23.78	25.99
1990	25.72	25.73	25.22	27.38
1991	26.75	26.95	26.14	28.68
1992	28.12	27.48	27.28	29.60
1993	28.60	27.35	27.65	30.06
1994	27.52	25.98	26.19	28.07
1995	25.89	24.76	24.76	26.59
1996	26.61	25.34	25.52	26.98
1997	26.92	25.02	25.68	26.56
1998	27.90	25.31	26.67	27.01
1999	28.49	25.35	27.23	26.99
2000	26.87	24.07	26.18	25.50
2001	27.64	25.31	27.20	26.57
2002	28.87	25.84	27.68	27.03
2003	28.45	25.91	27.41	26.84

c. 22 countries include Australia, Austria, Barbados, Canada, Colombia, Dominican Rep., Germany, Haiti, Israel, Italy, Jordan, Malta, Netherlands, New Zealand, Romania, Saudi Arabia, Singapore, South Africa, Sweden, United Kingdom, United States and Venezuela.

d. 30 countries include the 22 countries, plus Argentina, Belgium-Luxembourg, Brazil, Denmark, Finland, France, India and Japan.

Source: IMF (2006).

Appendix Table B: Goods and Service Exports and Imports by Fixed Sets of Countries, 1972-2003 (\$US, Billions)

Year	22 Countries ^a				30 Countries ^b			
	Goods		Services		Goods		Services	
	Credit	Debit	Credit	Debit	Credit	Debit	Credit	Debit
1972	215.9	210.2	52.3	56.9	n.a.	n.a.	n.a.	n.a.
1973	298.3	281.4	66.0	70.8	n.a.	n.a.	n.a.	n.a.
1974	426.4	403.5	80.0	86.3	n.a.	n.a.	n.a.	n.a.
1975	444.4	408.9	92.0	98.8	n.a.	n.a.	n.a.	n.a.
1976	494.0	472.9	104.7	112.6	n.a.	n.a.	n.a.	n.a.
1977	553.8	545.3	118.9	128.4	769.1	748.2	170.8	180.3
1978	642.2	636.6	142.7	154.1	898.4	870.3	206.0	216.6
1979	825.0	803.8	171.4	194.8	1,114.8	1,101.3	241.9	269.3
1980	1,008.3	957.6	202.9	228.0	1,352.8	1,328.5	288.9	319.5
1981	1,001.0	936.6	207.8	236.0	1,374.5	1,308.1	300.7	336.8
1982	914.3	884.7	211.5	235.3	1,259.2	1,231.0	295.3	325.2
1983	865.2	883.5	206.9	231.1	1,217.5	1,206.9	287.9	317.1
1984	906.6	974.2	210.7	238.5	1,290.7	1,304.4	292.8	325.0
1985	914.5	986.0	217.8	238.9	1,310.2	1,318.9	300.9	323.6
1986	1,019.8	1,096.2	258.2	271.8	1,486.7	1,465.0	354.8	374.4
1987	1,199.8	1,282.3	304.9	316.7	1,736.0	1,724.6	421.5	445.9
1988	1,386.4	1,447.1	335.6	350.1	2,002.5	1,956.0	468.1	505.7
1989	1,495.4	1,548.4	364.3	373.3	2,142.8	2,105.8	509.5	547.3
1990	1,728.8	1,754.4	444.6	451.4	2,454.9	2,403.0	619.2	657.9
1991	1,753.8	1,783.5	469.2	480.6	2,500.7	2,422.9	653.7	695.0
1992	1,848.7	1,900.5	519.9	522.3	2,658.4	2,557.3	725.2	757.0
1993	1,806.4	1,844.9	516.7	504.6	2,599.8	2,461.6	718.7	740.0
1994	2,029.8	2,072.2	558.6	538.4	2,926.4	2,792.7	766.3	784.0
1995	2,444.7	2,453.5	633.0	607.4	3,505.7	3,352.3	867.9	891.5
1996	2,568.6	2,548.3	683.6	645.7	3,610.5	3,479.8	921.4	938.9
1997	2,647.8	2,661.4	712.7	666.0	3,704.9	3,586.3	951.2	952.7
1998	2,616.7	2,727.0	730.2	690.2	3,658.8	3,621.2	975.8	978.2
1999	2,678.5	2,892.5	763.2	733.3	3,751.9	3,813.1	1,021.6	1,029.3
2000	2,930.8	3,219.4	787.5	774.8	4,082.2	4,246.1	1,068.8	1,082.7
2001	2,827.6	3,070.6	781.6	777.2	3,901.3	4,046.3	1,061.0	1,075.3
2002	2,879.1	3,152.9	831.3	814.9	3,998.0	4,115.7	1,106.8	1,112.6
2003	3,293.6	3,581.4	937.0	927.8	4,600.3	4,714.9	1,261.0	1,265.6
World (2003, 145 countries)	7,250.3	7,231.6	1,863.7	1,836.4	7,250.3	7,231.6	1,863.7	1,836.4

a. 22 countries include Australia, Austria, Barbados, Canada, Colombia, Dominican Rep., Germany, Haiti, Israel, Italy, Jordan, Malta, Netherlands, New Zealand, Romania, Saudi Arabia, Singapore, South Africa, Sweden, United Kingdom, United States and Venezuela.

b. 30 countries include the 22 countries, plus Argentina, Belgium-Luxembourg, Brazil, Denmark, Finland, France, India and Japan.

Source: IMF (2006)

Appendix Table C: U.S. Trade in Goods and Services, 1790~2005 [Millions of USD]

Year	Services		Goods	
	Exports	Imports	Exports	Imports
1790~1799 ^a	14.5	2.2	43.5	53.9
1800~1809	28.2	3.9	75.9	96.4
1810~1819	20.2	2.1	59.8	82.0
1820~1829 ^b	12.4	2.3	69.7	74.1
1830~1839	13.0	3.9	98.7	118.0
1840~1849	18.4	5.8	118.0	113.8
1850~1859	24.8	26.3	231.6	277.1
1860~1869 ^{c, d}	29.4	43.5	263.6	333.7
1870~1879	35.2	60.8	566.7	525.9
1880~1889	36.8	91.9	780.8	714.3
1890~1899	37.6	104.2	980.3	770.0
1900~1909 ^e	36.8	209.6	1,705.1	1,157.7
1910~1919	251	642	4,255	2,304
1920~1929	530	869	5,151	4,034
1930~1939	398	659	2,710	2,261
1940~1949	2,288	2,375	11,655	4,997
1950~1959	2,850	5,381	14,765	11,831
1960~1969 ^f	5,855	9,662	26,462	22,368
1960~1969	8,854	9,751	26,479	22,397
1970~1979	25,179	23,009	97,405	107,788
1980~1989	80,100	70,627	246,379	340,491
1990~1999	213,616	145,421	542,098	716,011
2000	299,490	225,348	771,994	1,224,408
2001	288,426	223,967	718,712	1,145,900
2002	294,854	233,737	682,422	1,164,720
2003	309,146	256,664	713,421	1,260,717
2004	343,912	296,105	807,536	1,472,926
2005 ^p	379,604	321,578	892,619	1,674,261

Note:

a: From 1790 to 1819, exports of services include only freight earnings; imports of services include only insurance earnings; exports of goods include exports of merchandise and sales of ships.

b. From 1820 to 1860, exports of services include freight earnings, port charges, and tourist expenditures; imports of services include freight earnings of foreign ships, and tourist expenditures; exports of goods include exports of merchandise and sales of ships.

c. Exports and imports of goods in 1860 Includes specie.

d. From 1861 to 1900, exports of services are equal to total shipping income plus foreign tourist expenditures plus port outlays of foreign passenger steamships; imports of services are equal to total shipping payments plus U.S. tourist expenditures. Exports of goods are the sum of exports of merchandise and the sales of ships.

e. From 1901 to 1970, exports of services are sums of transportation, travel, and other transactions; imports of services are sums of transportation, travel, direct military expenditures, and other transactions.

f. Data from 1960 to 1970 are available both from the Historical Statistics of U. S. and from the BEA website. Both of them are shown here for comparing. The first one is from Historical Statistics of U.S. and the second one is from BEA website.

p: preliminary

Source: 1790~1860: North (1960), Tables A-4, B-2, and B-3.

1861~1900: Simon (1960), Table 27.

1901~1959: U.S.Bureau of the Census (1975).

1960~2005, BEA website, <http://www.bea.gov/bea/di1.htm> (downloaded on March 14th, 2006)

Appendix Table D: U.S. Trade in Services as Percentages of Output in Services, 1929~2005

Year	Exports	Imports	Output of Services ¹	% of Output	
	[\$US, Millions]	[\$US, Millions]	[\$US, Billions]	Exports	Imports
1869-1873	37	59	1.6	2.34	3.74
1872-1876	37	66	1.8	2.09	3.73
1877-1881	32	62	2.3	1.37	2.64
1882-1886	38	91	2.9	1.33	3.19
1887-1891	37	109	3.1	1.21	3.55
1892-1896	38	99	3.4	1.12	2.92
1897-1901	35	125	4.4	0.78	2.82
1902-1906	28	189	6.5	0.43	2.89
1907-1911	57	310	8.9	0.64	3.48
1912-1916	103	366	11.7	0.88	3.13
1917-1921	708	1,166	18.5	3.83	6.30
1922-1926	416	743	26.7	1.56	2.78
1927-1931	483	966	30.7	1.57	3.15
1931~1935	308	558	29.2	1.06	1.91
1936~1940	525	703	34.5	1.52	2.04
1941~1945	2,739	2,892	81.8	3.35	3.54
1946~1950	2,074	2,221	90.0	2.30	2.47
1951~1955	2,517	4,778	142.0	1.77	3.37
1956~1960 ^a	3,594	6,985	194.0	1.85	3.60
1960 ^a	6,290	7,674	217.9	2.89	3.52
1961~1965	7,450	8,371	267.0	2.79	3.14
1965~1970	11,334	11,935	390.5	2.90	3.06
1971~1975	20,424	18,897	638.9	3.20	2.96
1976~1980	36,617	32,516	1,072.7	3.41	3.03
1981~1985	66,013	58,567	1,807.1	3.65	3.24
1986~1990	114,238	97,920	2,700.8	4.23	3.63
1991~1995	189,402	127,252	3,711.1	5.10	3.43
1996~2000	268,161	185,127	4,831.7	5.55	3.83
2001~2005	323,188	266,410	6,413.1	5.04	4.15

Note:

1. Output of services are in current prices.

a. Data of 1960 are available from both the U.S. Bureau of the Census (1975) and the BEA website. The one from the U.S. Bureau of Census is used in calculating annual averages.

p: trade statistics in 2005 are preliminary.

Source:

Trade 1869~1900: Five-year averages calculated from Simon (1960).

Trade 1901~1931: Five-year averages calculated from U.S. Bureau of Census (1975), Table U 1-25, page 864~866.

Trade 1929~1960: Five-year averages calculated from U.S. Bureau of Census (1975), Table U 1-25, page 864~866.

Trade 1960~2005: Five-year averages calculated from BEA website, <http://www.bea.gov/bea/di1.htm> (downloaded on March 14th, 2006).

Output of Services 1869~1931: U.S. Bureau of Census (1975), Table F 71-97, page 231.

Output of Services 1929~2005: Five-year averages calculated from BEA website, <http://www.bea.gov/bea/dn1.htm> (downloaded on March 20th, 2006).

Appendix Table E: U.S. Trade in Goods as Percentages of Output in Goods¹, 1929-2005

Year	Exports [\$US, Millions]	Imports [\$US, Millions]	Output of Goods [\$US, Billions]	% of Output	
				Exports	Imports
1869-1873	438	545	4.2	10.45	13.01
1872-1876	544	583	4.6	11.89	12.75
1877-1881	768	540	5.5	14.10	9.90
1882-1886	764	698	6.8	11.29	10.31
1887-1891	802	804	7.1	11.23	11.25
1892-1896	900	780	7.4	12.22	10.60
1897-1901	1,298	774	9.3	14.02	8.36
1902-1906	1,657	1,131	13.1	12.69	8.67
1907-1911	2,002	1,467	16.8	11.92	8.74
1912-1916	3,322	1,949	21.4	15.50	9.10
1917-1921	6,958	3,612	42.0	16.59	8.61
1922-1926	4,574	3,905	45.7	10.01	8.54
1927-1931	4,400	3,617	48.2	9.13	7.51
1931~1935	2,108	1,840	33.1	6.37	5.56
1936~1940	3,351	2,601	47.1	7.12	5.53
1941~1945	11,817	4,360	92.7	12.75	4.71
1946~1950	12,708	6,910	139.3	9.12	4.96
1951~1955	13,491	10,974	184.0	7.33	5.96
1956~1960 ^a	17,928	13,820	225.4	7.96	6.13
1960 ^a	19,650	14,758	243.4	8.07	6.06
1961~1965	23,025	17,611	280.0	8.22	6.29
1965~1970	33,158	30,422	382.7	8.66	7.95
1971~1975	73,901	74,774	576.1	12.83	12.98
1976~1980	157,265	182,779	947.4	16.60	19.29
1981~1985	217,168	290,423	1,398.2	15.53	20.77
1986~1990	308,220	440,296	1,888.0	16.33	23.32
1991~1995	477,744	607,001	2,389.6	19.99	25.40
1996~2000	683,371	970,215	3,084.4	22.16	31.46
2001~2005 ^p	762,942	1,343,705	3,614.5	21.11	37.18

Note:

1. Output of Goods refers to the final sales and are in current dollars.

a. Data of 1960 are available from both the U.S. Bureau of the Census (1975) and the BEA website. The one from the U.S. Bureau of Census is used in calculating annual averages.

p: trade statistics in 2005 are preliminary.

Source:

Trade 1869~1900: Five-year averages calculated from Simon (1960).

Trade 1901~1931: Five-year averages calculated from U.S. Bureau of Census (1975), Table U 1-25, page 864~866.

Trade 1929~1960: Five-year averages calculated from U.S. Bureau of Census (1975), Table U 1-25, page 864~866.

Trade 1960~2005: Five-year averages calculated from BEA website, <http://www.bea.gov/bea/di1.htm> (downloaded on March 14th, 2006).

Output of Goods 1869~1931: U.S. Bureau of Census (1975), Table F 71-97, page 231.

Output of Goods 1929~2005: Five-year averages calculated from BEA website, <http://www.bea.gov/bea/dn1.htm> (downloaded on March 20th, 2006).

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