

Prices for International Services Transactions Issues and a Framework for Development

Catherine L. Mann
Senior Fellow
Institute for International Economics
CLMann@IIE.com
Final September 22, 2004

Abstract

Modes of international engagement in services have broadened beyond cross-border arms-length transactions to affiliate sales, intermediate sales, and the activities of professional persons. The Internet and information technology are fragmenting services 'production,' separating goods and services transactions, and the resulting intermediate transactions can be delivered through various channels. In the past, tensions between product-based and transactions-based classification systems have been resolved by bundling service transactions into product categories that net out intermediate transactions, including intermediate services. In the future, price series for international service transactions will need to separately price service transactions from goods transactions, and price as separate series intermediate transactions through different delivery channels. Without this clear focus on services as a growing and independent part of international engagement, the impact of international transactions in services on the US economy, including for output, employment, inflation, and productivity will be mismeasured and likely underestimated.

Table of Contents

Abstract.....	1
I: Introduction: Why focus on prices for international trade in services?.....	3
II: The Importance of Services	5
1: Services in the national accounts.....	5
2: Linking domestic and international activities—GDP vs. GNP	6
Chart 1: US real GDP-GNP and income receipts.....	7
3. Global engagement through international trade and affiliate sales.....	8
Table 1: International trade in services and affiliate sales in perspective.....	8
Chart 2: Measures of external balance and global engagement.....	9
III: International trade in services: Concepts and Challenges	12
1: How new is international trade in services?	12
2: The role for Internet and information technologies.....	12
3: A schematic and vocabulary for services in global trade and sales.....	14
Figure: Schematic of changing boundaries and geographical origin of activities	16
4: Services in the NAICS and US balance of payments systems.	17
5: International trade in services according to the international institutions.	18
6: Implications for price concepts: IPP vs. PPI.....	19
7: Summary.....	21
IV: Uses for prices	22
1: The key notion of ‘substitution’ as measured by relative prices	22
2: Prices for deflation and measuring inflation.....	22
3: Competitiveness and the terms of trade.....	23
4: Estimating elasticities	23
5: Summary.....	24
V: A disaggregated look at international services	25
1: ‘Other’ private services vs. transportation and government.....	25
Charts on international transactions in services.....	25
2: A closer look at selected private services	28
Table 2: Decomposition of international trade in services	29
Figures on decomposition of exports and imports of ‘other private services’	31
3: Linking to data on multinationals.....	32
Figures on services sales by affiliates (MOFA and MOUSA)	33
4: Estimates by consultancies on future international transactions	36
5: Issues related to prices for the detailed international services data	38
VI: Summary, Challenges, and Possible Directions for IPP.....	40
End Notes.....	42

I: Introduction: Why focus on prices for international trade in services?

Services account for upwards of 50 percent of real private GDP by national accounts spending concepts, 84 percent of real private GDP by industry of origin, and 70 percent of private employment. So, we know that services are important for the US economy. What about services in the international environment?

International trade in services has become a growing component of the US economy, with the total value of this trade (exports plus imports as measured) accounting for nearly 25 percent of total trade and over 5 percent of US GDP in 2002. Thus, understanding how international trade in services fits into real gross domestic product is increasingly important, and prices are needed for that objective.

But, cross-border trade is not the only way to deliver services. The Internet and information technologies are transforming the global strategy of international business by enabling a globalized and disaggregated services production and sales network that includes cross-border trade; affiliate production, sourcing, and sales; intellectual property flows; and movement of professional persons. This global services production and sales network is intimately tied into the US domestic economy, and the profitability and activities of US firms, and therefore of both gross national and gross domestic product. Understanding globalized services and its links into the US economy is increasingly important for understanding the dynamics of the US economy.

Moreover, price concepts that go beyond deflators for cross-border transactions are increasingly important. Researchers and policymakers need prices for international services transactions to answer both old and new questions. Prices as deflators allow us to incorporate the resources embodied in services transactions into the system of national accounts and GDP. But, prices of international services transactions do much more: They feed into domestic inflation. In addition, the relative price of international transactions compared to domestic prices of similar transactions and compared to the price of similar activities that take place abroad help explain the decision to produce services at home, undertake them through affiliates abroad, or to buy abroad at arm's length. These prices also deflate the affiliate sales abroad, which are incorporated into US GNP. International prices are used in estimation research to determine whether trade in goods and trade in services differ as the US and global economies grow and how exchange rates get passed through to US inflation. International services prices feed into our understanding of how globalization affects productivity growth and employment.

So, international prices are key to understanding the magnitude, determinants, and implications of international transactions in services for US macroeconomic performance and international competitiveness. But, changes in international relationships and in information technology mean that it is increasingly difficult to define the concepts of 'international' and 'service' as economically distinct from 'domestic' and 'good'. We need a framework that will help statisticians create data and economists answer questions, both those that are economically interesting and those that are demanded by their institutions.

This paper starts by presenting current data on transactions in services as well as assesses the future importance of international transactions in various types of services. Section III presents a simple schematic of how services fit into the concepts of both business firm and national boundaries, and considers how technological changes may affect services within the concept of the business firm and national boundaries. With this framework as background, existing definitions of services by various statistical agencies and for different purposes are reviewed. Section IV addresses how price indexes are used for statistical purposes and for research, considering in particular how services prices are used. Section V narrows the focus of analysis to the category of services known in the international data as 'other private services' and addresses tensions facing statisticians as they prepare new prices for international transactions in services. Section VI summarizes and concludes with possible directions for the International Price Program.

II: The Importance of Services

Services are increasingly important in the US economy, and increasingly important in international transactions. Moreover, the advent of the Internet and information technology increasingly allows for international transactions in services to become embedded in domestic economic activity. Thus, measuring international transactions is increasingly important for understanding basic data on the US economy.

1: Services in the national accounts

The importance of services in domestic economy can be viewed from three perspectives: The national accounts decomposition into major spending groups (consumption, investment, government spending, and net exports); GDP decomposed by industry of origin; and employment, by both sector and occupation.

With respect to the national accounts decomposition, services are broken out of the national GDP accounts spending groups explicitly in personal consumption expenditures and in international trade, and incompletely in investment and government spending. On the other hand, with respect to gross domestic product by industry of origin, several different types of services (ranging from finance to transportation) are broken out. Comparing the spending side to the origin side, the shares of US GDP accounted for by services are quite different. Herein is the first example of the most basic difficulty with regard to services: How important are services in the US economy? It is fair to say we don't really know.

First, consider the spending groups within GDP. As with many exercises involving the chain indexes, calculations of shares and ratios of components are only illustrative of order of magnitude, not exact; nevertheless, services are large in US GDP. Services account for 60 percent of real personal consumption expenditure. In real gross domestic investment, there is no breakdown for services, but suppose that we treat software as a service. Treating software as a service in the national accounts is not standard practice. However, international trade data sometime classify software as a service and sometimes embed it with a good, which points out already the challenges and difficulties to be observed in the national and international accounts. In any case, software accounts for 16 percent of real non-residential gross private domestic investment. In international trade, net exports of services contribute in a positive accounting fashion to GDP; services account for about 30 percent of exports and about 15 percent of imports. Suppose we add up these spending categories on services and divide by real private GDP (real GDP less government spending). This is just to get a flavor for the magnitude of services in real GDP: Around 50 percent of real private GDP comes from services that we can relatively straightforwardly identify in the national accounts.

It would seem that these spending categories must have embedded services that are not broken out. By way of comparison, services (including transportation, wholesale and retail trade, finance insurance and real estate and other services) add up to 84 percent of private industry product. So as measured by production, services are much larger in the

US economy than when services are measured using data on spending. In employment, service occupations account for about 90 percent of private employment. Thus, services are large in terms of the spending groups, larger in terms of output measures, and even larger in terms of employment.¹ This suggests that services are embedded in many of the goods consumed and invested in the US. What would happen to consumption and investment if more and more of these services were produced in part abroad?

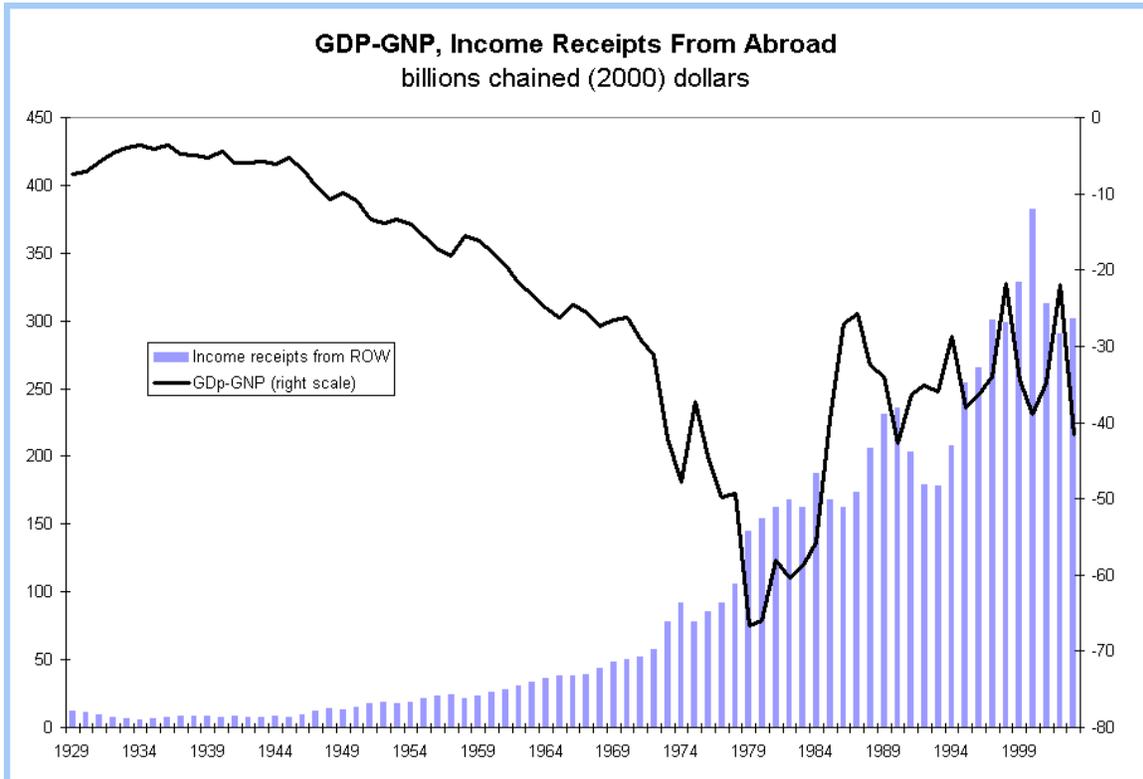
2: Linking domestic and international activities—GDP vs. GNP

Understanding international transactions in services is interesting if for no other reason than net exports of services is a positive contributor in an accounting fashion to US GDP, in stark contrast to the overall negative net export balance. But, cross-border transactions are not the only way that firms engage in global activities, and indeed for the US, other forms of international activities are far more important and are growing faster. Both the cross-border activities and the other international activities are embedded in both the value and deflators for the domestic components of GDP and industry output. How do we account for these other international transactions in standard statistical profiles for the US?

The most fundamental difference is that cross-border transactions contribute to gross *domestic* product, but other forms of international activities of US firms contribute to gross *national* product. Thus, tracking the difference between GDP and GNP measures of global engagement may give some insight into how the international activities of firms affect US economic activity such as job creation, productivity growth, and inflation. For example, the activities of Ford in Europe would be included in GNP, but not included in GDP. The activities of Honda in the US would be included in GDP, but not in GNP. The activities of GE's call-center in India would be included in GNP, but not GDP. The activities of WIPRO-US's software programmers would be included in GDP, but not GNP. The transactions between Ford USA and Ford Europe appear in both as trade. Do these distinctions matter? On net maybe not, but on gross, the numbers are more compelling for further research.

Chart 1 shows that the difference between US GDP and US GNP is small—about \$75 billion chained (2000) dollars at the peak. But uniformly, GNP is greater than GDP, indicating that on net the return to the US of US firms' activities abroad exceeds that of foreign firms' activities in the US. Understanding the trend before 1979 and the pattern after 1979 requires additional research, including, perhaps, how the nature of the international environment changed with flexible exchange rates. Looking at just the income receipts from the rest of the world shows the growing contribution of these receipts, which range up to about \$375 billion chained (2000) dollars.

Chart 1: US real GDP-GNP and income receipts



3. Global engagement through international trade and affiliate sales

As the national accounts data suggest, US global engagement through trade and foreign affiliates sales is large and growing. In particular, cross-border trade in certain private services and sales of certain kinds of services via affiliates are not only already large, but they are the fastest growing elements of US global engagement and, arguably, are in the greatest state of flux on account of the Internet and information technology. (Table 1)

Table 1: International trade in services and affiliate sales in perspective

Measures of Global Engagement			
Millions of US\$. Details may not equal totals due to seasonal adjustment and rounding.			
	1992	2002	Change
Cross Border Trade (net)	(38,186)	(418,038)	(379,852)
Goods	(96,898)	(482,872)	(385,974)
Services	58,712	64,834	6,122
Affiliate Sales (net)	356,032	575,473	219,441
<i>Affiliate Sales of Services (net)</i>	12,584	65,283	52,699
			Growth (%)
Cross Border Exports	616,455	974,107	58.0
Goods	439,631	681,874	55.1
Services	176,824	292,233	65.3
US Affiliate Sales Abroad (total)	1,578,683	2,929,609	85.6
<i>Affiliate Sales of Services (MOFA)</i>	140,553	432,179	207.5
Cross Border Imports	654,639	1,392,145	112.7
Goods	536,528	1,164,746	117.1
Services	118,111	227,399	92.5
Foreign Affiliate Sales in US (total)	1,222,651	2,354,136	92.5
<i>Affiliate Sales of Services (MOUSA)</i>	127,969	366,896	186.7

sources (all from Bureau of Economic Analysis):

trade data: <http://www.bea.gov/beat/di/home/trade.htm>; table 1 for goods and services.

affiliate sales of services: <http://www.bea.gov/beat/di/1001serv/intlserv.htm>

affiliate sales (total all and total majority owned) : MOUSA <http://www.bea.gov/beat/di/di1fdiop.htm>; MOFA <http://www.bea.gov/beat/di/di1usdop.htm>

1992 data affiliate sales abroad total and MOFA: <http://www.bea.doc.gov/beat/articles/internat/usinvest/1994/0694ii.pdf>, tables 10, 11.2

1992 data affiliate sales in the US total and MOUSA <http://www.bea.doc.gov/beat/articles/internat/fdinvest/1994/0794iid.pdf>, tables 17.1, text table 15

To examine the linkages between affiliate sales and traditional measures of cross-border trade is important for a number of reasons. First, affiliate activity abroad and export activity are positively related, at least in the case of merchandise trade where most of the academic research has been undertaken. Second, global sales of US multinational affiliates might be increasing from the affiliate location abroad, rather than from the US

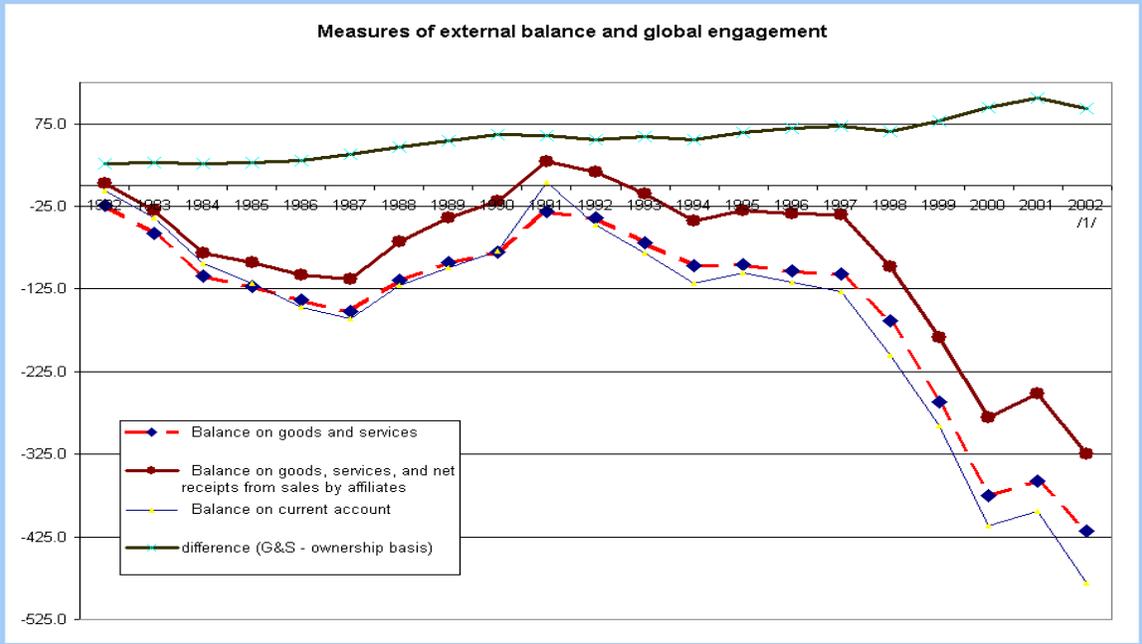
location through net exports. In this case, the indicator of cross-border transactions would not increase, but the sales abroad would, which would tend to widen the gap between GDP and GNP.

For trade in services, some preliminary work suggests that direct investment abroad contributes to imports from affiliates (rather than exports to affiliates), but that foreign direct investment in the US reduces US imports of services from the foreign parent. Further research is necessary to determine whether these findings hold across all types of services transactions (where transportation services behave quite differently from business and professional services) and whether any relationship might be affected by the Internet and information technology.² Clearly, price indexes and related trade and investment data for services become key ingredients to this research.

As a further incentive to engage in research on the various relationships in global engagement, Chart 2 compares three measures of external balance: the current account, the goods and services trade balance, and the ownership based measure of external balance (which sums the trade balance with net receipts from sales by affiliates). The general behavior of the ownership-based external account mimics the other two measures, but with a positive difference. The positive difference reflects, apparently, the ability of the US firms to effectively and efficiently combine US management and other assets with foreign inputs to create greater value in markets abroad than the reverse combination of foreign management and US resources create in the US for foreign affiliates.³ It might also mean that US affiliates abroad are selling to third markets to a greater degree, whereas foreign affiliates in the US sell to the US domestic market only. The fact that the difference between the measures widens modestly in the second half of the 1990s could suggest an increasingly important competitive edge enjoyed by US firms in their relationships abroad, which may be related to the increased role for services in trade, direct investment, and affiliate sales. Further research, which depends on international and domestic prices for services, is needed to test such hypotheses.

The contribution to the US economy of net sales by affiliates abroad (both service and goods affiliates) is around \$100 billion. Although these net receipts do not represent a cross-border flow of goods or capital, they do indicate the importance of international integration of production and distribution for US corporate fitness and dynamism which is part of the underpinnings of why productivity growth and US economic performance excelled in the late 1990s.

Chart 2: Measures of external balance and global engagement



Source: Bureau of Economic Analysis: <http://www.bea.gov/bea/di/home/more.htm>

4: Global forces, services, and productivity

Service sector productivity growth is increasingly important for understanding the productivity performance of the United States going forward. Recent research by Triplett and Bosworth finds that for many service industries multi-factor productivity growth rose dramatically after 1995, and was an important ingredient in the overall productivity performance of the US during that time. Information technology appears to have played an important role, as well as purchased intermediates, which supports the notion that ‘contracting out’ plays a key role in improving efficiency in the services industries.⁴

But, what about the role for *international trade* in services, sometimes called offshore outsourcing for their results? Mann’s research indicates the globalized production of information technology hardware reduced the price of IT hardware some 10 to 30 percent lower than it otherwise would have been, spurring investment in IT hardware by firms throughout the US economy—both manufacturing and services industries. Thus, global sourcing was important for the overall productivity performance through this channel. Using this model of IT hardware, she argues that a similar effect on prices of software and IT services may be underway on account of increased international trade in these activities, in particular through the channel of information-technology-enabled international trade in services.⁵ As noted, international trade in services and affiliate sales of services both grew faster than trade and affiliate sales overall. Testing this hypothesis requires data on international trade in services, particularly on intermediates, as well as the relevant price measures.

III: International trade in services: Concepts and Challenges

1: How new is international trade in services?

There has always been international trade in services. Transportation and communication services bridge the physical distance between buyer and seller of a good. Tourists travel to experience new cultures, students go to school abroad, and temporary workers send money home.

In most economic literature, however, services were termed ‘non-traded’ because, as a matter of fact, high transactions costs (measured in time, distance, or otherwise) prevented the close proximity of buyer and seller deemed necessary for the economic activity to take place. For the price of a hair-cut, it was not worthwhile to drive very far. Custom and regulation also raised transactions costs and limited international trade in services: Financial services, legal services, or administrative services may require handshakes, face-to-face signatures, a local examination, or passing papers between contracting parties. Many services require skills (including language and local knowledge) that have kept them from being traded internationally. Finally, the ‘production’ of certain services, such as responding to a customer question, reading a MRI, drafting a blue print, or writing a computer program, have been functions integral to an organization’s business strategy or at least the task was not easily separable from the on-going activities of the firm.

Over time, however, the Internet and information technologies (hardware and software) have created new service activities, enabling more of these activities to be done without close proximity, and creating new combinations of goods and services. At least as important, rising levels of income and educational attainment in countries outside the US, improved communications infrastructure that link countries, openness to direct investment between home and host countries, all encourage the provision of service activities abroad, as well as allows a wider range of service activities to be done across international borders. Thus the concept of services as an internationally tradable activity, and the relationship between goods and services are evolving. All these changes make developing price indexes for service activities in international trade particularly challenging, but incredibly timely.

The question of the moment is, what changed to increase the range of services that can be traded across borders? To what extent is this globalization of services different from or similar to the globalization of goods that has been underway for some time. Finally, what are the implications for devising price indexes?

2: The role for Internet and information technologies

The Internet and information technologies highlight several key conceptual challenges in the arena of international trade in services. First, digitization of service activities means that information or software or advice need not be relegated to a physical carrier medium in order to be traded; for example, software need not be put on a diskette or disk drive to

be traded or used internationally. Second, organization and codification of information reduces the specific knowledge needed to use the information; for example, the on-screen menu system in a customer-service center is a tool that replicates expert knowledge so that people with less specific knowledge can be more productive. Third, new software programming technologies and management divide software into stages of design, coding, integration of parts, fixing bugs, and customer interface with the final product.

Digitization, expert systems, and modern software methods create the potential for more international trade in ‘intermediate services’. Service activities can be broken-down into components, which can then be strung together according to the international division of labor, just as manufacturing activities have been disaggregated into discrete production units that are aggregated into an international value-chain. These changes are very important for international trade in services because differences in prices for the components will determine where the activity takes place—inside a corporate organization (insourced) and across international boundaries (offshored), at arms-length (outsourced) and inside a country, or arms-length and cross-border (outsourced and offshored), and so on. By and large, the classification systems for services do not yet address these issues.

For example, the UN *Manual* does not consider (and indeed the Interagency Task Force is continuing its work on exactly these issues)⁶ what to do about international trade when there is no physical carrier medium for the service activity and where the service activity is an ‘intermediate’ and therefore separable from the ultimate consumer. The Internet and information technologies clearly allow the ‘division of labor and emergence of markets’ but there is no physical trade by buyer or seller and many of the products are not ‘final’.⁷ It is not clear where services such as call-centers, Internet-enabled medical diagnostics or software program repair (e.g. ‘fixing bugs’) belong in the UN scheme.

NAICS and the US balance of payments data, to a greater or lesser degree, recognize these categories of activities, but there are challenges to obtaining and using such data. First, the classification may not be by activity, but by parent’s product, so software programming could be scattered among a variety of products rather than be measured as a particular activity in its own right. Second, it may be difficult to obtain data on digital transactions through survey because corporations may keep data on activity by business line, but not by international boundary and not by activity or cost. For example, there may be data on computer maintenance and repair, but it is not separated from customer-service costs. Or, there may be data on customer-service costs, but not where the service originates (Idaho or Ireland).⁸ A business may collect data on overall management and telecommunications costs, but not separate them by business line, or separate these from the labor cost component of, say, customer-service or programming. Whereas some of these questions are not new, and have been addressed in the context of domestic data, the issues will become increasingly relevant to address through a framework for collecting and constructing international data.⁹

These issues are discussed in more detail in the following sections, but first, an overall framework is presented for the types of transactions that are increasingly being undertaken in the global marketplace.

3: A schematic and vocabulary for services in global trade and sales

The Internet and information technology are more easily enabling the disaggregation of production activities of a firm, as well as enabling more of these activities to be done abroad. The first of these changes the boundaries of the firm, and has been called 'outsourcing'. But, outsourcing increasingly has the connotation of moving an activity abroad—that is, changing the geographical boundaries of operations—whether under the corporate umbrella or not, called 'offshore outsourcing' or 'offshoring'. Nearby is shown a set of schematics of the various types of transactions that we would like to track and why.

We start with an integrated firm in the US that makes robots. There is no international trade, and no affiliate transactions. The price index for robots includes implicitly the services as well as the manufacturing activity. Since none of the transactions are separated, there would be no way to disintegrate them from the manufacturing activity of the firm.

Sticking just with examples of services activities, the first kind of outsourcing might be when certain back-office and tech-support activities are removed from under the corporate umbrella of a manufacturer to dedicated suppliers of back office and tech support services in the US. Back-office and tech-support have been 'outsourced', but remain 'onshore'. Now, there are separate price indexes for back office and tech support services, but the price index for robot manufacturing should net these out in construction of the price index for robots. The price index for robots with services outsourced will not be the same as under the integrated scenario because prices for the integrated services were not previously available. The time series properties of the robot price index will change as service activities are outsourced.

The next scenario is one where service activities are offshored, but not necessarily outsourced. Now, there are international trade and direct investment transactions to track. The prices of outsourced and offshored services (undertaken through the foreign supplier) could be different from prices of offshored, but not outsourced services (those undertaken through the foreign affiliate of the US firm are insourced, even if offshored). The transfer pricing problem that emerges is not new, but in the digital world is even more difficult to track. In addition, there might also be some tech support done in the US, which could, for example, be higher valued added activities (such as more important clients). The earnings of the foreign affiliate of the US firm would augment GNP, but the cross-border transactions would reduce GDP. There are three possible price indexes for tech support, one domestic and two international, all measuring somewhat different activities or different corporate choices.

The next example is a fragmentation of the production process of software into component activities done by three separate players: outsourced-offshored activities undertaken by foreign-owned firms abroad, US owned firms abroad (where the activity is insourced but offshored) and outsourced onshore (from the original robot manufacturer but in the US).

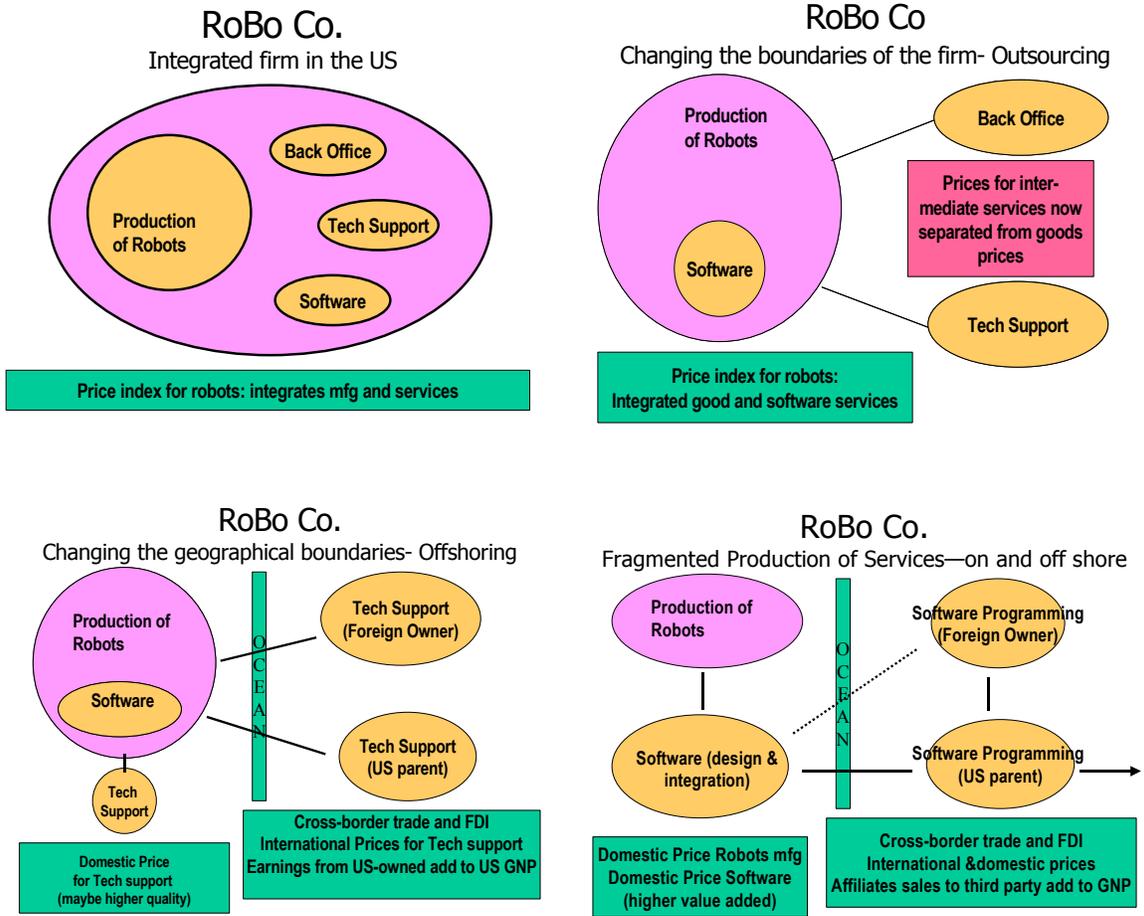
In this scenario, basic programming tasks are undertaken by a foreign firm. The foreign affiliate of a US firm integrates these activities and sends the completed components to the US parent, which then sells them to the robot manufacturer. How does the US parent software firm decide to offshore, as well as to outsource some of the programming tasks? It makes choices based on the relative price of buying the offshore-outsourced tasks (shown by the dotted line) vs. the offshore-insourced tasks (solid line). In this case, the only international transactions observed are the ones insourced within the software company. But the international competitiveness of that transaction depends on the price of the offshore-outsourced transaction. Tracking both transactions—offshore-outsourced and offshore-insourced is important. And, for the domestic comparison, the onshore-outsourced activities as well need to be tracked.

Moreover, as shown, based on its transactions with the foreign company, the offshore-insourced company is able to sell to third buyers. This shows up as affiliate sales, and ultimately, in GNP. No evidence of this competitiveness would show up in US GDP.

Note that the domestic PPI for robots in this final example will still net out the software, leaving the false impression that robots are purely manufactured goods of domestic origin.

Which of these transactions do we currently track in terms of value data and in terms of price indexes? The next section discusses existing data. The short answer is, not many.

Figure: Schematic of changing boundaries and geographical origin of activities



4: Services in the NAICS and US balance of payments systems.

In the context of developing prices for international trade in services, there are two reasons to touch briefly on the evolution of services in the North American Industry Classification System (NAICS). First, to analyze US international competitiveness in the multilateral context, it is important that US international price data for trade transactions can be compared with international price data from other countries. Second, to analyze the relative competitiveness of domestic vs. foreign producers of services, the US international price data need to be comparable to domestic price data for similar classification of services transactions. It is difficult to achieve both objectives.

The evolving notion of services is embodied in the NAICS; indeed a key objective of NAICS was to update and broaden the classification of services sectors from the 1930's-origin Standard Industrial Classification (SIC) system. Before that could be accomplished, however, the Committee engaged to develop the system face two issues: the goods-services boundary and classification philosophy—that is, should a service be classified according to how it is produced, or what it does, or to whom it is sold?

With regard to the goods-services boundary, the NAICS committee, somewhat like the UN task force, ultimately argued that more effort should be spent on appropriate classification of services rather than on where the service activity is undertaken. In the end, the committee argued that the goods-services boundary would be determined on 'pragmatic' grounds.¹⁰ Consequently, services undertaken within the corporate structure of a manufacturing firm are included in data on manufacturing. However, when the service activity is undertaken by a separate establishment, it is allocated to the appropriate service group. Thus, to some extent, the evolution of services over time in the NAICS data will reflect an evolution of the corporate boundary toward the use of temporary help, out-sourcing of activities to separate corporate entities, and so on.

With respect to international issues, the NAICS does not resolve the tension between the production-based philosophy and the balance of payments (BOP) transactions-based philosophy. In practice, at some levels of aggregation, the NAICS and BOP are similar (although the BOP data, consistent with the SNA is strictly limited to cross-border activities). For example, the NAICS' Professional, Scientific, and Technical Services sector includes activities where the knowledge and skills of workers is the main ingredient to the production process. The BOP Business, Professional, and Technical classification includes a similar set of activities, but the cross-border component is much smaller since more of the activity is undertaken via affiliates (who are classified according to NAICS). The difference in the 'financial services' categories (including banks in NAICS system and in the BOP data, but not in the NAICS' affiliate data) is a legacy reporting issue moving toward consistent coverage. That is, bank activities are included in cross-border exports and imports, but heretofore have not been included in estimates of activities through affiliates, in part because other agencies of the US government collect the data. However, given the likely increasing importance of bank activities through affiliates, BEA now collects and estimates these transactions beginning with the 2002 benchmark survey.¹¹ On the other hand, the NAICS' Information sector

includes establishments that produce, manipulate and distribute information, data, and transactions as well as establishments that transmit or distribute these products.¹² In the BOP data (both cross-border and through affiliates) this category is ‘scattered across several categories in the tables for cross-border trade and for sales by affiliates’¹³ and, for example, would have to include BOP data for telecommunications, which bears little resemblance to actual value of transactions because of the accounting conventions used between telecommunications companies.

5: International trade in services according to the international institutions.

Over the past few years, the international institutions of the International Monetary Fund (IMF), the United Nations (UN), and the World Trade Organization (WTO) have evolved toward greater recognition of services and of the importance of services in international trade, as well as broadening the definition of international trade in services. First, services can be distinguished from goods as characterized by ‘abstract concepts rather than by physical attribute or physical function.’¹⁴ Second, international trade in services is not just cross-border activity between buyers and sellers, but also is linked to foreign investment and movement of people. Hence, classification and definition of services in the international sense by international institutions incorporates various modes of delivery of services, rather than simply measuring the activity through cross-border trade.

The IMF’s *Balance of Payments Manual 5 (BPM5)* covers international trade in services in the traditional cross-border sense, that is, imports and exports in the System of National Accounts. When the General Agreement on Trade in Services (GATS) came into force in 1995 as part of the Uruguay Round undertaking, it included a broader definition of internationally traded services, specifically activities in the host economy associated with direct investment and the movement of people engaged in service activities. Making the bridge between the *BPM5* and the GATS, the UN, in conjunction with an Interagency Task Force, set out in 2002 the *Manual on Statistics of International Trade in Services*. Specifically, the *Manual* extends the definition of ‘international trade in services’ to include the value of services provided through foreign affiliates and by non-permanent movement of persons. Thus, international trade in services extends significantly beyond the notion of cross-border trade in the ‘goods’ sense.

The GATS four modes are important because they explicitly acknowledge linkages between cross-border trade in the traditional sense like goods (mode 1 and mode 2), the link between trade and direct investment inside a corporate organization (mode 3), and the link between trade and movement of people for professional activities (mode 4).

- Mode 1 ‘cross-border supply’ covers services supplied from one country to another, such as international telephone calls or Internet-related web-services where the customer stays in his or her own country.
- Mode 2 ‘consumption abroad’ covers activities where consumers from one country travel to the other countries to make use of a service in another country, such as tourism, education, and medical services.

- Mode 3 ‘commercial presence’ covers activities when a company from one country sets up subsidiaries or branches to provide services in another country, for example wholesale outlet, or branch bank.
- Mode 4 ‘presence of natural persons’ is when individuals travel from their own country to supply services in another, such as construction worker or software programmer.

In implementation though, there are still problems. First, the GATS modes and the UN *Manual* while making important strides in defining international trade in services broadly, acknowledge significant tensions and blurring in goods vs. services. Second, the match between the SNA and the GATS is imperfect.

With regard to the second issue, Modes 1 and 2 are clearly exports and imports in the SNA sense, Mode 3 is not, and Mode 4 is troublesome.¹⁵ Mode 4 is acknowledged to be an import or export of labor services, but data are not usually available that detail these labor services.¹⁶ Rather they appear as flows of remittances, in another part of the international accounts, rather than incorporated into trade flows. These issues matter for producers of price indexes. In particular, the Internet and information technology are enabling more activities to be undertaken in Modes 1 and 3 (perhaps in substitution for Mode 4), particularly as ‘intermediates’ inside a corporate structure that might be classified as manufacturing. Thus, much of the most interesting and challenging international service activities have no clear identification in classification schemes and have no source of detailed data.

In the *Manual*, services are defined as a ‘heterogeneous range of intangible products and activities...often difficult to separate from goods....’ On the one hand, the *Manual* ‘respects the 1993 SNA use of the term *services*...[which] are not separate entities over which ownership rights can be established [and which] cannot be traded separately from their production [meaning that] by the time their production is completed they must have been provided to the consumers.’ On the other hand, the *Manual* also notes a qualification to the SNA that ‘there is a group of industries...that produce outputs that have many of the characteristics of goods, ie. those concerned with...information, advice, and entertainment...where ownership rights may be established [and] are often stored on physical objects—paper, tape, diskettes, etc.—that can be traded like ordinary goods... thus making possible division of labour and the emergence of markets (emphasis added).’

6: Implications for price concepts: IPP vs. PPI

The two main issues faced in the context of *services* – classification philosophy and treatment of intermediates – already exist in the context of the US producer price index (PPI) and the export and import price indexes produced in the International Price Program (IPP).¹⁷

The philosophy of the PPI is industry based, and has as its objective to deflate the *net* output on an *industry* basis. Thus, intermediate activities are netted out and intra-firm trade within an industry group that might go along with these intermediate activities is

not included. Thus, service activities (such as back-office administration, customer-service call-centers, integrated software programming) that take place inside the corporate boundaries of a firm classified in the manufacturing sector would not be netted out of the manufacturing PPI. If these activities occur outside a manufacturing firm (outsourced) and by a service-sector firm (as in the NAICS classification scheme), that service PPI will price these transactions.

Inconsistent treatment of a service activity that is netted out within an industry PPI, but is priced separately when that activity takes place at arm's length is not a new issue. Over time, as the boundaries of the firm change to focus more on 'core competency' (say, production of a tangible product) while outsourcing the services activities, then the set of economic functions that are included in the industry PPI will change, and this will impact the time series properties of the PPI. Whereas the mode of delivery of these transactions (via the Internet for example) is not central to the pricing problem, it is the case that the Internet may enable more rapid and more extensive changes in the boundary of the firm's activities, both across the spectrum of economic activities and across geographical boundaries.

In contrast, the IPP trade indexes are *transactions or product* based, with the objective to construct real exports and imports as inputs to the US National Income and Product Accounts. Export and import transactions are, generally, collected on a *gross* basis. Accordingly, so long as the international trade data exist for transactions in intermediates, the IPP would by its objective construct a price to go with them. Sometimes these transactions occur within the boundaries of a firm (insourced), but across national boundaries (offshored). The IPP faces this challenge of cross-border intra-firm transactions in addressing transfer-pricing issues.¹⁸ But, the IPP faces the additional challenge, already noted in the context of the UN *Manual*, of how to treat international trade transactions that do not involve a physical transaction that triggers identification of an export or import, but rather involves in whole or in part a digital transaction, whether between related parties or not. In the international transactions data, although intra-firm transactions in goods are collected, the survey system does not currently collect the full range of information on intra-firm transactions in services.

Both because the transactions are digital and because the survey does not ask for intra-firm transactions in services, it is quite possible that a wide range of IT-enabled international trade in service activities (from back-office administration and customer-service call-centers, to software programming and on-line medical diagnostics) are not, at this time, adequately accounted for in the international transactions data.¹⁹ What should IPP do? If there are no cross-border transactions data that need to be deflated for the national accounts, then perhaps IPP should do nothing. On the contrary, because IPP data are used for many other purposes, pricing these transactions independent of the National Accounts objective is quite important.

Prices are used to address a number of question about international trade and the relationship between international trade and the US economy overall, both at a point in time and over time. These questions fall into the categories of international

competitiveness and terms of trade, as well as econometric questions where international prices play a key role, such as estimating income and relative price elasticities of international trade. Accordingly, the range of international prices that IPP should cover extends beyond the narrow set of prices to match international transactions for entry into the national account.

7: Summary

In the context of developing prices for international service transactions, the evolving notion of services and the different approaches to classification philosophy yield several challenges. The most important is how the Internet and information technology are allowing the disaggregation of production of services into component parts. This ability heightens additional problems, which are the difference in classification philosophy between production-based and transactions/product-based systems and the difference between SNA-based and GATS-based definition of international trade.

IV: Uses for prices

Price indexes exist for a number of reasons and the choice of price index varies according to the objective. This can create overlap as well as gaps in coverage. In the context of services, a key challenge is how intermediate transactions are treated. This is particularly germane when considering how the Internet and information technology is allowing more service transactions to be broken into components, undertaken outside the corporate umbrella, and across international boundaries.

1: The key notion of ‘substitution’ as measured by relative prices

Most fundamentally, detailed prices allow investigation into the concept of substitution, which is related to many concepts of competitiveness as well as to the price of the final service delivered (either as part of a bundled good or not). There are multiple dimensions of substitution relevant for prices of international services transactions:

- Substitution between domestic and foreign sourced activity, such as a US vs. an Irish tech support or call center;
- Substitution across international boundaries as well as across time, such as software programming done at 3am in the US or at 3pm in Australia;
- Substitution across GATS delivery ‘modes’, such as US export of software over the Internet to a buyer in France vs. the sale of that software from a corporate outlet in France;
- Substitution across modes and ownership relations, such as an Indian programmer coming to Seattle vs. staying in Bangalore and sending software code over the Internet, all under the Microsoft corporate umbrella, vs. Microsoft engaging the services of a WIPRO Inc consultant either in person or via the Internet;
- Substitution across the goods vs. services boundary, such as shrink-wrap DVDs vs. streaming video.

Internationally comparable prices are needed to assess the extent of these economic forces and their implications for US trade, affiliate sales, with consequent influence on US output, productivity, inflation, and employment.

2: Prices for deflation and measuring inflation

Price indexes are constructed for a variety of purposes, both economy-wide and at detail level. With respect to economy-wide analysis, deflators are designed to evaluate resource use to compare to other data on real activity. The deflation concept is key in that the real side of the trade accounts is an input to the system of national accounts. If more service activities are done abroad, proper accounting in the trade accounts is a prerequisite for proper macroeconomic measures of real GDP and productivity growth.

In addition, economy-wide measures of inflation depend on disaggregated price measures. Since services are very important in the consumer price index, the effect of internationally traded services could be very important to track.

3: Competitiveness and the terms of trade

International competitiveness and the terms of trade are two concepts that relate international trade to the domestic economy. International competitiveness, in concept, is whether US produced products are priced competitively in global markets or not. The terms of trade, or the relative price of exports to imports, helps assess how expensive it is, in terms of resources used in the economy, to obtain products from abroad. We want to understand and measure these concepts because they have implications for international trade flows, and therefore production and employment.

In a simple world, international competitiveness is cleanly defined: A producer uses only domestic resources and exports the final product into the global marketplace. If these conditions are true (and abstracting from movements in the exchange value of the dollar), the price of the exported product could be compared to the price of a similar product in the destination country as well as to the price of similar exports from third countries. Similarly, in the case of the terms of trade, the price of imports would depend only on the domestic resources of another country. So, export prices and import prices would not overlap in terms of resource use, leaving the understanding of the terms of trade quite clear.

In the context of international trade in services, the many dimensions of substitution detailed above means that the concepts and measurement of international competitiveness and terms of trade are quite murky. The desire to understand and measure these concepts still stands, but it is fair to say that many, if not most, of the elements needed to produce key ingredients do not exist.

For example, when a firm chooses between cross-border export of an IT engineer traveling from the US to a client vs. selling engineering services from a foreign affiliate using local engineers, there is a relative price concept of export competitiveness which will be important and will feed into trade and employment. Or, suppose that software can be produced more cheaply by combining US program design with offshore program coders. Some relative price will determine when such international disaggregation of value and production is profitable, and the change in location of production or purchase of intermediate services will change the price of the final service delivered in the US, with implications for overall prices, trade, and employment.

4: Estimating elasticities

International price data are used to estimate two elasticities common to international analysis: the Marshall-Lerner condition and the Houthakker-Magee asymmetry. The Marshall-Lerner (M-L) condition determines whether the price elasticity of exports and imports are of sufficient magnitude such that a depreciation of the currency will yield a sufficiently large enough change in the sum of export and import volumes to improve the trade balance of a country. The Houthakker-Magee (H-M) asymmetry is the empirical regularity observed for the US that the estimated income elasticity of imports exceeds the income elasticity of exports (these estimations require international prices in the model),

a regularity that is not consistent with long-run equilibrium.²⁰ As international trade in services has become more important for the US and has a higher profile in international institutions (particularly in negotiating venues), examining these two elasticities has generated heightened research interest.

Using existing US data, estimating these elasticities for international trade in goods and in services reveals interesting differences. First, there is evidence that the H-M asymmetry is less apparent in international trade in services estimated using standard balance of payments data and currently available prices. If international services transactions do have a relatively higher income elasticity for exports than imports (compared to the elasticities for merchandise trade), then an increasing share of services transactions in trade could change the parameters of sustainability for the US current account. On the other hand, estimated price elasticities in these regressions sometimes do not meet the M-L test, so a devaluation of the dollar might not lead to sufficiently large improvements in import and export volumes to have the expected effect on the trade account.²¹ Whether the international price measures used in these estimations are ‘right’ is a very large question.

5: Summary

International prices for services are integral to macroeconomic issues of deflation and inflation and are key for proper estimation of key elasticities in international trade. However, the increasing scope of service transactions (to include affiliates and people) as well as the manner in which information technology allows service activities to be disaggregated and produced remotely as part of a value-chain or production means that there are many new relative prices and forms of substitution across modes of international trade. The new substitution possibilities and the associated relative prices should be at the heart of a framework for developing international prices, since these inputs will affect the top-level macroeconomic measures of inflation, deflation, trade flows, growth, and employment.

V: A disaggregated look at international services

The discussion so far has focused on some key issues facing producers of international price data. Existing data systems offer a frame of reference and boundaries for what is reasonable to do by way of new prices for international services transactions.

1: 'Other' private services vs. transportation and government

As noted earlier, trade in services is composed of several categories, some more related to goods or non-economically motivated activities of governments, rather than the notion of business and professional services, or telecommunications and financial services, or education and medical services.

Chart 3 shows the overall dynamic of trade in services, charts 4 and 5 breaks out transportation services and government services. The net trade balance in transportation services (which includes tourism, passenger fares, and transportation) shows a dramatic change around 1997. The origin of this change is not clear, but may be related to a similar significant break in the behavior of trade in capital goods. Further research, including using the new price data for transportation services will shed light on behavioral break.

Ordinarily trade in government services does not warrant attention. Exports and imports have average around \$10 to \$15 billion each. But, the approximately \$20 billion dollar swing from surplus to deficit is noticeable in the overall services trade balance. The significant rise in imports since 2001 represents payments abroad to embassies for security as well as to service men and women involved in conflicts and peace-keeping missions.

Charts on international transactions in services

Chart 3: US Trade in Services, \$USmn

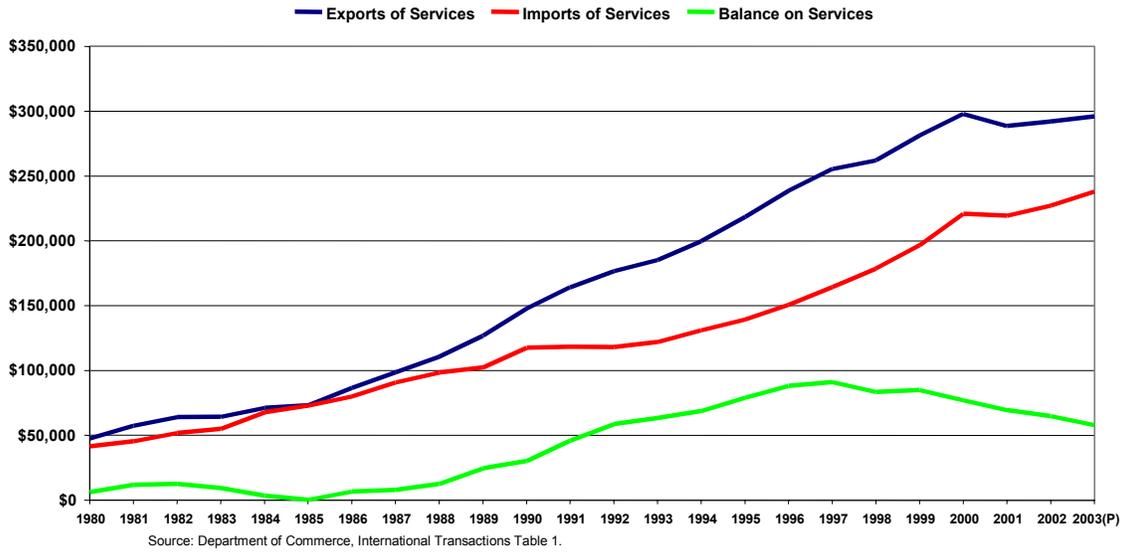


Chart 4: US Trade in Transportation Services, \$USmn

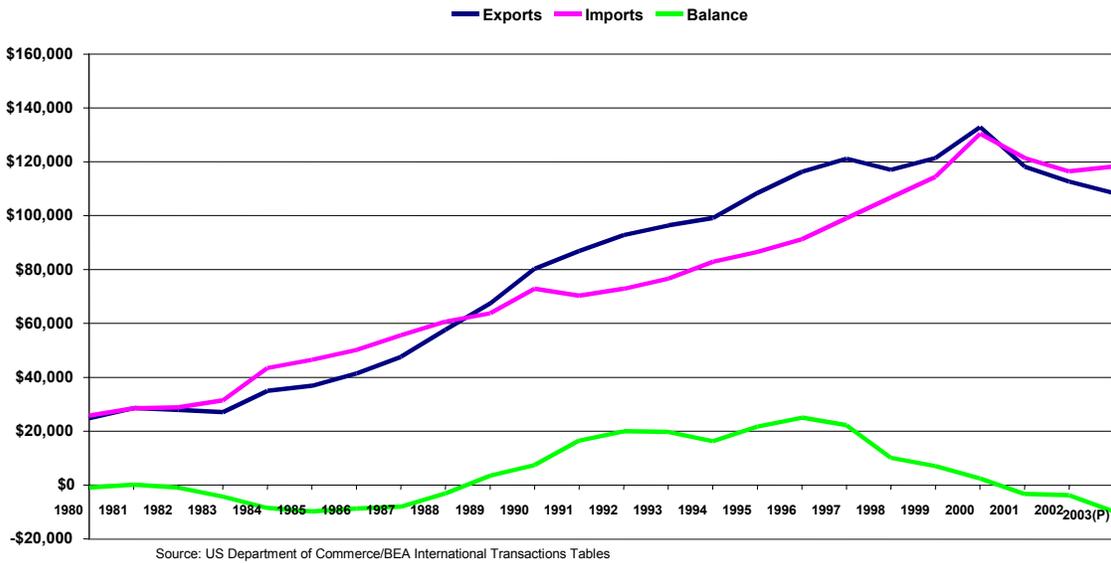
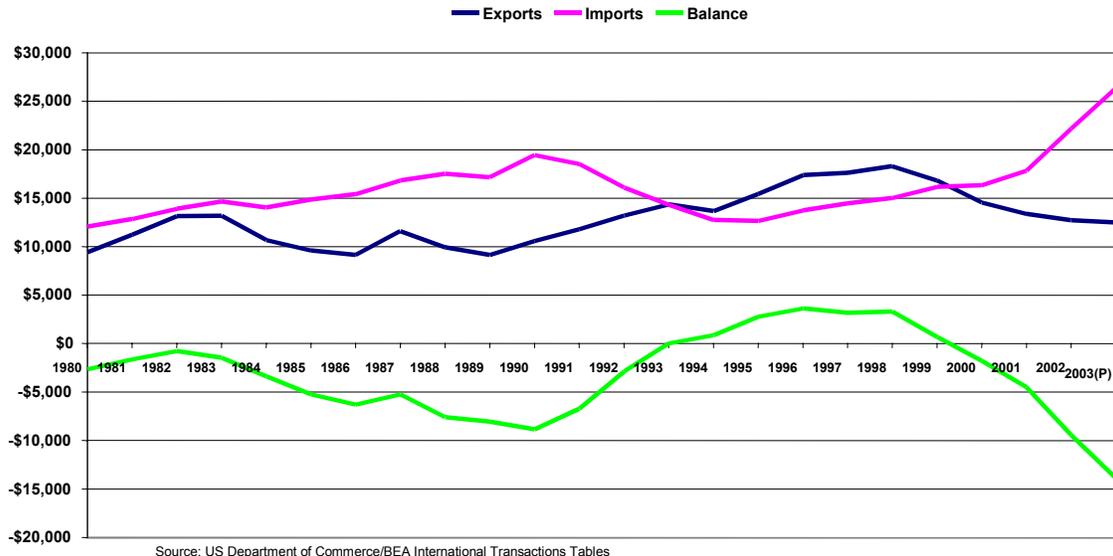
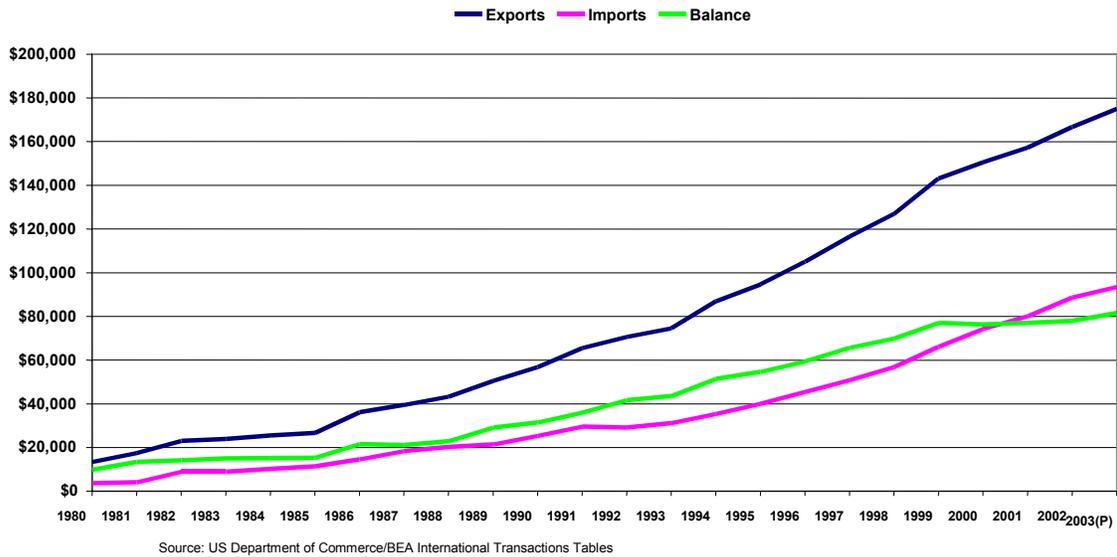


Chart 5: US Trade in Government Services, \$USmn



We now get to examine trade in “other” private services, which is a better match to the notion of services in the US economy. First, exports and imports are both continuing to grow, with exports outstripping imports. A modest slowdown in export growth has caused the net balance to level off. Research indicates that these private services have the opposite asymmetry in relationship between import growth and US income and export growth and foreign income.²² This means that relatively sluggish demand abroad is particularly damaging to US exports of private services, but that a return to more robust income growth would expand exports more than proportionately.

Chart 6: US Trade in Private Services, \$USmn



2: A closer look at selected private services

The scope of effort to develop international prices for services transactions cannot cover all service sectors. Which sectors of private services should receive priority attention? The sectors with the largest value transactions, the sectors where the classification systems of trade and affiliate transactions are best bridged, and the transactions that are changing most rapidly on account of networked information technology should be the focus for development of international prices.

But, these also are the sectors which pose the greatest challenge to the process of developing international prices. These sectors are the ones where the links between cross-border and affiliate transactions is greatest, which contributes to the challenge of pricing intra-firm transactions and to the challenge of transactions in intermediate services. Moreover, these sectors are where the boundary between goods and services is most blurred. Finally, in some sense, many of the prices relevant to measure international engagement are outside the current scope of the International Price Program.

A first step toward prioritization considers existing data as well as gaps and need to bridge between cross-border transactions and affiliate sales. Then, we consider the role for the Internet and information technology and review how that might prospectively change international transactions using references from consultancies.

Table 3 shows the magnitude of several categories of cross-border trade and global engagement for 1992 and 2002. Exports of all services increased 65 percent from \$177 billion in 1992 to \$292 billion 2002. Imports of all services increased 93 percent from \$118 billion to \$227 billion in 2002. Overall affiliate sales of private services are an even larger value of transactions than cross-border services transactions. US firms' affiliates'

sales abroad totaled \$432 billion in 2001, up from \$159 in 1994. Sales by foreign affiliates in the US totaled \$367 billion, up from \$145 billion over the same time period.

Table 2: Decomposition of international trade in services

Table 1: Measures of U.S. International Engagement		
In millions of dollars. Details may not equal totals due to seasonal adjustment and rounding.		
	1992	2002
Cross Border Trade	(38,186)	(418,038)
Goods (1)	(96,898)	(482,872)
Services	58,712	64,834
Transportation and Fares	19,969	(26,186)
Intellectual property	15,680	24,884
Other Private Services	25,933	53,158
Affiliate Sales of Services	12,584	65,283
Cross Border Exports	616,455	974,107
Goods (1)	439,631	681,874
Services	176,824	292,233
Transportation and Fares	92,891	90,354
Intellectual Property	20,841	44,142
Other Private Services	49,864	122,594
Affiliate Sales of Services (MOFA)	140,553	432,179
Cross Border Imports	654,639	1,392,145
Goods (1)	536,528	1,164,746
Services	118,111	227,399
Transportation and Fares	72,922	116,540
Intellectual Property	5,161	19,258
Other Private Services	23,931	69,436
Affiliate Sales of Services (MOUSA)	127,969	366,896

trade data: <http://www.bea.gov/bea/di/home/trade.htm>; table 1 for goods and services; tables 19, 20 for services decomposition

affiliate sales of services: MOUSA: <http://www.bea.gov/bea/di/1001serv/intlserv.htm> (MOFA)

affiliate sales (total all and total majority owned) : MOUSA <http://www.bea.gov/bea/di/di1fdiop.htm>; MOFA <http://www.bea.gov/bea/di/di1usdop.htm>

1992 data affiliate sales abroad total and MOFA: <http://www.bea.doc.gov/bea/articles/internat/usinvest/1994/0694ii.pdf>, tables 10, 11.2

1992 data affiliate sales in the US total and MOUSA <http://www.bea.doc.gov/bea/articles/internat/fdinvest/1994/0794iid.pdf>, tables 17.1, text table 15

Data on cross-border trade in private services can be redivided into three main categories:²³

- (1) Transportation and travel-related expenses, composed of ‘travel’, ‘passenger fares’, and ‘other transportation’;
- (2) Transactions in intellectual property, measured as ‘royalties and license fees’ paid among affiliates and between unaffiliated parties;

- (3) 'Other' private services, composed of 'education', 'financial services', 'insurance services', 'telecommunications', and 'business, professional and technical services', which itself is composed of numerous detailed activities.

However, the behavior of the three main categories described above increasingly has diverged over time and the impact of the Internet and information technology on the various components may differ as well.

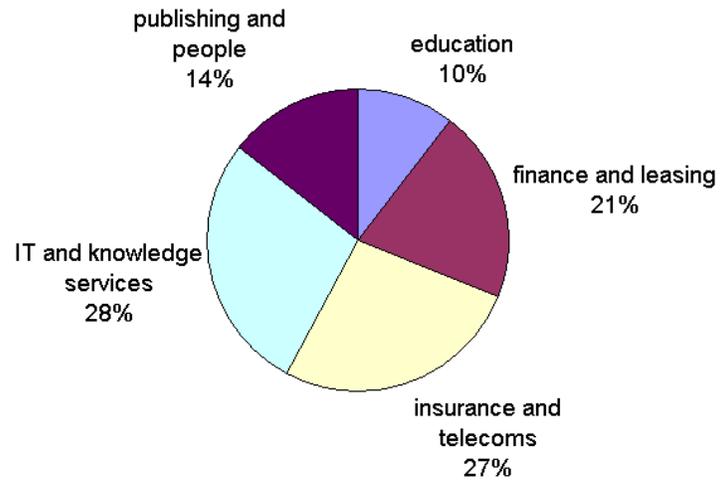
For example, as shown in Table 3, the net balance on the transportation components was in surplus about \$20 billion in 1992, but was in deficit about \$26 billion in 2002 due largely to the very large and growing imbalance of trade in goods (which are transported to the US in part on non-US flag carriers) as well as factors relating to the terrorist attacks. Royalties and license fees have grown, but only about one-third as fast as the final category 'other' private services, although the trade balance in royalties and license fees remains positive. 'Other private services' (OPS) has been expanding faster than total services to account for \$123 billion in exports in 2002 (42 percent of total services exports, and 18 percent of total exports of goods and services) and \$69 billion in imports (30 percent of total services imports and 6 percent of total imports of goods and services).

Other private services is a large category composed of a variety of sectors: education, financial services, insurance services, telecommunications, and business and professional and technical services, which in turn includes computer and information services, management and consulting services, research and development and testing services, operational leasing, and a variety of other categories. By virtue of these being categorized in the international trade data, these are clearly tradable and they are services. But, which of these categories might bridge to other data, might be more affected by the Internet and information technology, and be of greatest importance going forward in time?

Figure (category shares for export and imports of OPS transactions in 2002) shows a recombining of the BEA data into somewhat different categories, just to highlight potential priority categories as well as data issues. .

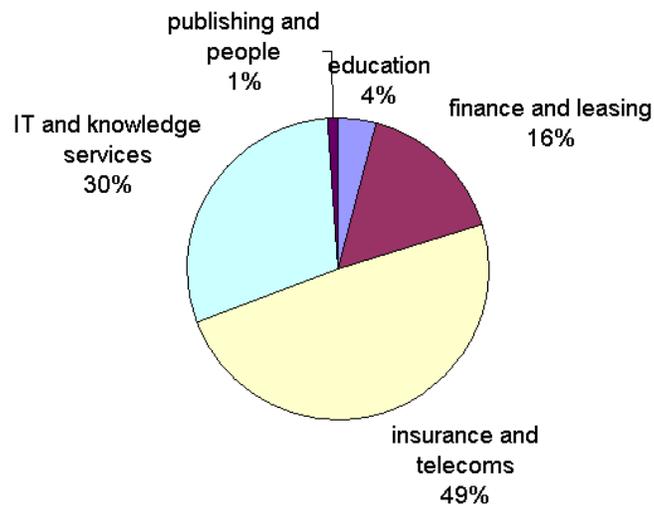
- (1) Education services: 'education'
- (2) Finance and leasing: 'financial services' and 'operational leasing'
- (3) Insurance and telecommunications: 'insurance services'; 'telecommunications'; and 'other business, professional and technical services:affiliate'
- (4) IT and knowledge services: 'Computer and information services', 'management and consulting services', 'research and development and testing services'; other business, professional, and technical services: unaffiliated'.
- (5) Publishing and people: "other services" which includes 'file and television tape rentals' and 'other services', which is principally remittances associated with the movement of people.

Figure 1
Cross-border exports Other Private Services
\$123 billion (2002)



Figures on decomposition of exports and imports of 'other private services'

Figure 1
Cross-border Imports Other Private Services
\$66 billion (2002)



Some of the data are undergoing substantial re-working so that they better reflect economic activity. For example, international trade data for telecommunications is more a product of an accounting-rate system under which telecommunications carriers bilaterally negotiate fees for carrying international traffic. Because US carriers are cheaper, more calls are routed through the US (as in ‘call-back’ plans), yet the accounting convention yields a deficit on telecommunications rather than what would be a surplus based on competitiveness and activity.

One area that is not slated for significant revision is computer software and programming. Currently, software is treated as an intermediate embedded in goods trade, consistent with the NAICS production-based classification and the *BPM5*. However, as software programming is broken down into component activities of application design, coding, integration, and maintenance (that is, fixing bugs), the activity will be disaggregated between domestic and foreign locations. The share of trade in these IT and knowledge services are likely to rise. As the Internet and information technology help create an international integrated production process for software and applications, it will be important to have the relative prices that allow examination of substitution across production possibilities between home and abroad.

3: Linking to data on multinationals

As noted in the general discussion, there is a close and increasingly important relationship to understand between parents and affiliates. This section discusses more what we know about the multinational behavior and relationship to trade.

Data on affiliate sales of private services are based on BEA’s classifications using the NAICS classification of the affiliate (so services done in manufacturing affiliates is classified under manufacturing). A re-classification chosen to highlight certain sectors of potential priority interest is shown in Figure 2 (category shares for MOFA and MOUSA sales for 2001). This reclassification is designed to match to some extent the trade data and consultancy descriptions of what services might be most prone to being done through foreign affiliates, or by firms abroad.²⁴

- (1) Services embodied in manufacturing-sector activities: ‘Manufacturing’, from the ‘other industries’ category: ‘agriculture, forestry, fishing, hunting’; ‘construction’; ‘mining’; ‘utilities’;
- (2) Services embodied in trade and transportation sectors: ‘Retail trade’, ‘wholesale trade’, ‘transportation and warehousing’
- (3) Services embodied in publishing and telecoms sectors: ‘information services’, (excluding ‘software publishers’; ‘information services and data processing services’)
- (4) Services related to IT and knowledge sectors: ‘software publishing’; ‘Information services and data-processing services’ and ‘professional, scientific, and technical services’;
- (5) Services related to FIRE: ‘finance (except depository institutions); insurance’; and ‘real estate and rental and leasing’;

- (6) Less tradable support services: ‘management of non-bank companies and enterprises’; ‘administrative support and waste management’; ‘health care and social assistance’, ‘accommodation and food services,’ ‘miscellaneous services’.

Figures on services sales by affiliates (MOFA and MOUSA)

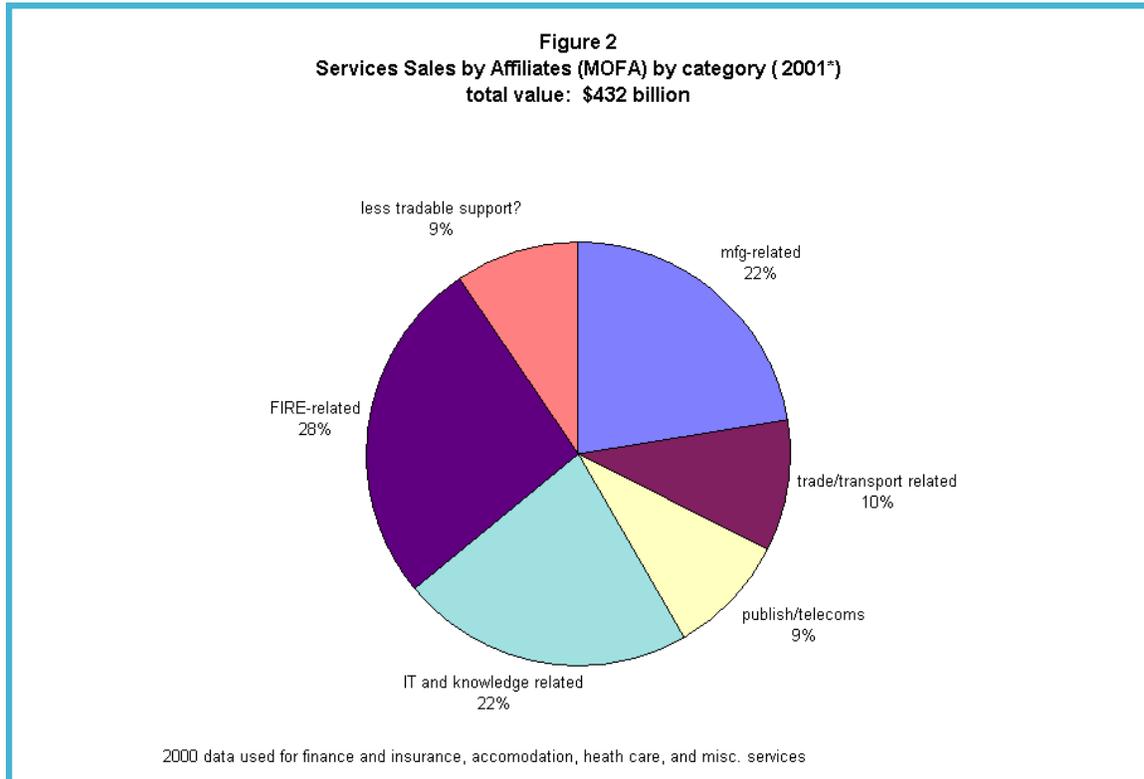


Figure 2
Services Sales by Affiliates (MOUSA) by category (2001)
total value: \$367 billion

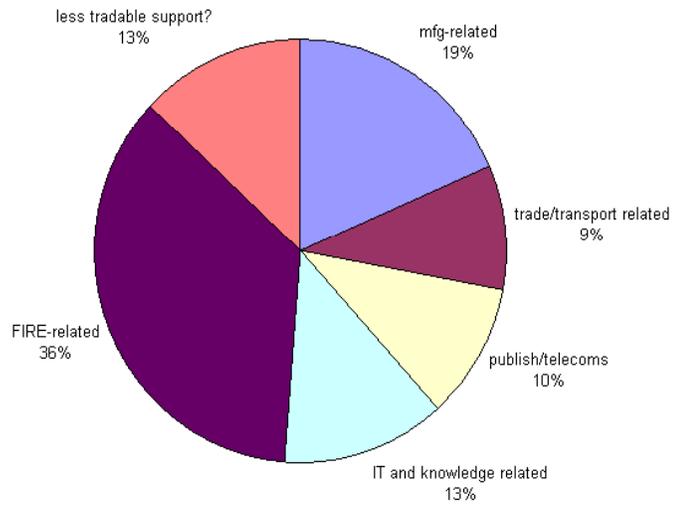
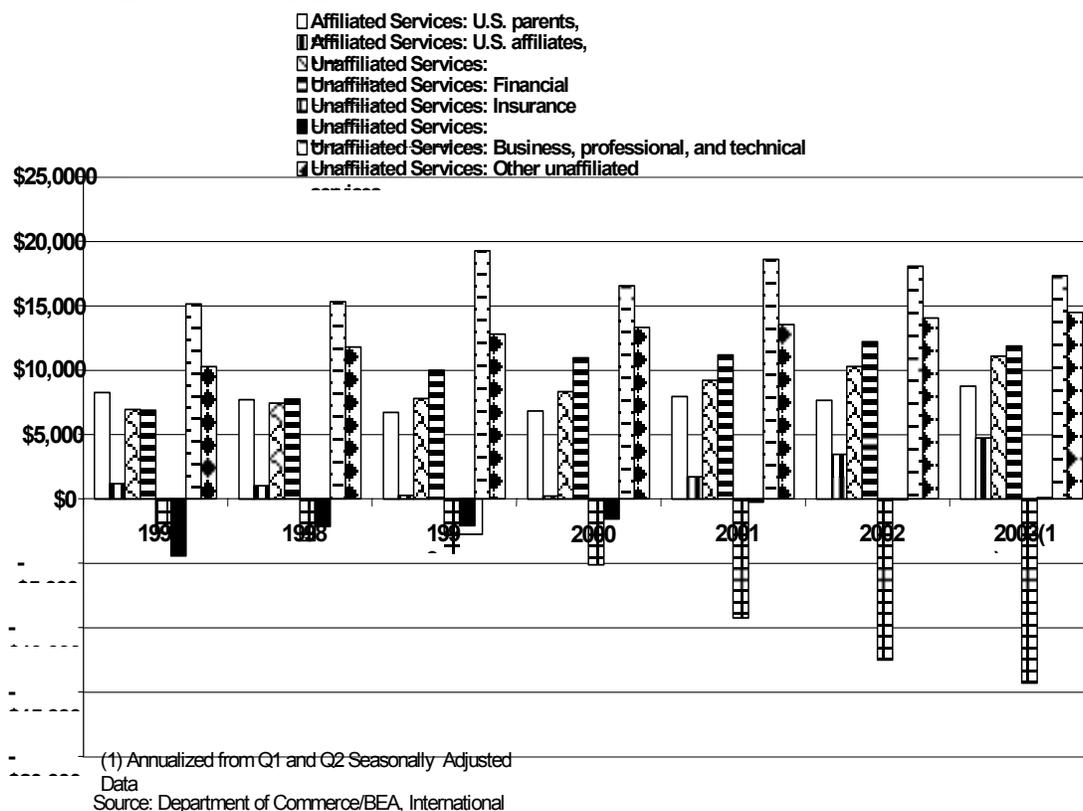


Chart 7: Balance of Trade in US Other Private Services Trade



*

Services trade offers a different perspective on the relationship between multinationals and their affiliates. Affiliated services trade refers to intra-firm services transactions in multinational companies from all economic sectors.²⁵ Affiliated trade by both US multinationals and foreign multinationals post positive trade balances. (Chart 7)

“US parent, Net” is the payments made to US located parent companies from their overseas affiliates, minus payments from US located parents to their overseas foreign affiliates – for example the transactions between IBM in the US and IBM’s subsidiary in India. “US Affiliates, Net” refers to the payments received by US located subsidiaries of foreign multinationals from their foreign parent companies, subtracting payments made by the US located subsidiary to their foreign parent – for example transactions between Deutsche Bank in New York and the Deutsche Bank headquarters in Frankfurt. Both categories exhibit slowly increasing surpluses.

A first implications is that although US multinationals are expanding overseas and integrating their operations globally, this has not been associated with a deterioration of the US services trade balance. So, anecdotes which that US multinationals are increasingly sending their back-office and administrative work overseas cannot be

corroborated by the data, which instead shows that the services trade balance for multinational companies (both US parent and foreign parent) is improving.

A second observation is that foreign multinationals with subsidiaries in the US also are increasingly doing their internal service transactions in the US. This also contrast with the behavior on the merchandise account and suggests that the US has maintained a strong competitive position in services transactions within foreign multinational companies.

Finally, a note of caution. Some US firms have been moving their headquarters to low-tax jurisdictions, such as Bermuda. When firms do this, what used to be recorded as a service export may now be eliminated from the trade balance or be recorded as a service import.

As for the international trade data, improvements to affiliate data are also underway. For example, detail on bank activities are not currently included in finance, but will be soon. Insurance premiums are not currently shown net of losses; but new benchmark data will help adjust the affiliate sales data for these economic facts.²⁶

As in the case of the international trade data, pulling out information on the software production process—indeed all service and support activities that are currently done intra-firm in the manufacturing sector is a challenge. Yet, these back-office operations and logistics operations are increasingly being done on an international basis on account of the possibilities for reducing costs.

All told, the pervasiveness of the Internet and information technology may influence the extent to which cross-border trade, affiliate sales, and Mode 4 personnel movements are complements, substitutes, or are otherwise inter-related (for example, through ‘intermediates’ production). Consultancies offer some additional insights on what services may be the most affected by networked information technologies.

4: Estimates by consultancies on future international transactions

Consultancies analyze which service sectors might be most prone to international activities on account of the Internet and information technology. Their assessments do not fall neatly into the data classification schemes of the official statistical agencies, which, as discussed tend to scatter the activities across categories or even net them out. Often consultancies use terms such as ITES (information technology enabled services) or BPO (business-process off-shoring), but these terms do not have consistent meanings. Some consultancies describe the range of services that can be off-shored as seemingly limitless; others describe the functions as ones that can be ‘either digitized or handled by telephone, [with] appropriate skills available or easily developed at the offshore center.’²⁷ These activities could include a range of services including call-centers, financial services, software programming, engineering design, human resource paperwork, data entry and transcription, among others mentioned. The business relationship between the on-shore firm and the off-shore firm could be captive (MOFA), joint venture (MOFA or

minority owned?), or arms-length. The estimates from the consultancies are not comparable and sometimes their projections are over-weighted by media and their own business strategic hype. But, taken all together, these projections may offer some insights as to the potential direction for international trade in services.

- IDC projects that the worldwide market for IT enabled international trade in services and intermediate services will grow from \$712 billion in 2001 to \$1.2 trillion in 2006, an 11 percent annual rate. Of this 'logistics' is the largest segment at \$309 billion projected for 2006, an annual average growth of 17 percent. But, engineering R&D, marketing, sales, and legal services are all projected to be over \$100 billion in worldwide sales with average annual growth rates of near 10 percent for the 2001-2006 period. Other segments include human resources, purchasing, and financial services.²⁸
- Forrester projects that worldwide revenues associated with business-process offshore activities will increase from \$103 billion in 2002 to \$226 billion by 2006. Of this data-center outsourcing is the largest category with over \$100 billion in sales in 2006, and a 14 percent average annual growth rate. IT application outsourcing could rise by 50 percent per year to \$35 billion by 2006.²⁹
- Evaluserve projects US-sourced IT services and ITES will increase from \$32 billion to \$98 billion by 2010 (a 15 percent annual growth).³⁰
- AT Kearney suggests that business process offshore activities (which in this survey of auto companies included predominantly engineering and technical services, IT application development and maintenance, and financial services) by US companies overall could increase from \$4 billion in 2000 to \$24.2 billion in 2005, to \$65.5 in 2010.³¹

How might these off-shore initiatives affect the price of services in the US? These assessments give a taste of the relative price of domestic to foreign substitution possibilities discussed in concept earlier. Information from a variety of consultancies suggest that moving some components of services off-shore reduced costs of these services, as well as in some cases improved quality, and extended resources of the companies.

- AT Kearney's survey of auto companies suggested that costs were reduced by 31-50 percent (41 percent of survey respondents) and 10-30 percent (40 percent of survey respondents);³²
- Evaluserve's estimates that off-shore ITES could reduce costs by 10-15 percent for insurance, 8-12 percent for banking, 5-6.5 percent for pharmaceuticals, 1.5-2.5 percent for telecoms, 1-2 percent for automotive, 0.2-1.8 percent for airlines.³³

- A presentation at the New York Federal Reserve Bank suggested that programming costs (dollar per line of code) was \$5.3 in India, \$10.6 in Ireland, \$10.1 in the US and \$29.3 in Germany.
- With respect to call centers, a presentation at the New York Federal Reserve Bank suggested that the cost of a 100 seat call center was 50 percent cheaper in India compared to the US; even though the telecommunications costs were higher, the wage differential was about 5 to 1. McKinsey suggested that call-centers in India can achieve 50 percent greater profitability than a US center on account of time-shifting as well as restructuring the operation because labor is cheaper in India.³⁴

Clearly, with little official data on these activities, the consultancies are having a field-day. As a result, these numbers are being used to assess the macroeconomic implications of international production services for the US, including most prominently, the potential loss of jobs.³⁵ The need for accurate, consistent, and dispassionate measures of international trade and engagement in service activities has never been greater and will increase over time as the forces of the Internet and information technology enable more service to be disaggregated into components with some done abroad

5: Issues related to prices for the detailed international services data

So, private services appear to be the fastest growth category of trade and consultancies think that trade in intermediate services will explode. But, data collected on international trade and affiliate sales of private services are a bit of an amalgamation, and, as noted differ by reporting classification. Even going forward, as US statistical agencies coalesce around the NAICS system, there will remain the need to match this statistical classification to the one used internationally and by our trading partners. Moreover, the activities of individuals (GATS Mode 4) rather than firms could start to become more important. Thus, generating price data that will meet these various needs bears keeping in mind.

With respect to current reporting classification, data collected by the Bureau of Economic Analysis on cross-border trade broadly uses the ‘standard components’ recommended in the International Monetary Fund’s *Balance of Payments Manual 5*. Some of the deeper disaggregations will use the NAICS classification system in the future, and currently use the BEA’s International Survey Industry’s classification system.³⁶ These data cover transactions between a US and a foreign person, whether that person be affiliated or unaffiliated.

In contrast, data collected on affiliate sales uses the NAICS classification system, and, as named, covers transactions between an affiliate and persons in the host country. That is, these affiliate sales are not cross-border transactions and therefore would appear to be outside the scope of the International Price Program. But as discussed, because of the close relationship between cross-border transactions and affiliate activities, and the range of substitutions of activities and associated relative prices, it is important that

international price measures be applicable to both types of transactions at some level of data aggregation.

A second important issue is the treatment of compensation when the mode of delivery is the movement of a person to deliver the service (GATS Mode 4). If the individual crosses the border to provide the service and stays more than one year, that person is no longer classified as a US resident (in consideration of an export) or a foreigner (in consideration for an import). Rather, the person is considered a resident of the country to which he or she has gone, and thus their activities would not be in-scope of the data on international transactions of exports (imports) or affiliate sales. On the other hand, if that person crosses the border for less than one year and provides a service, the return is included in compensation receipts (payments) in the international transactions accounts and is not broken out by the type of service that person provided. As detailed in Annex I of *BPM5*, this leads to an under estimation of international service transactions.³⁷

While these issues may not appear to be materially relevant, there are two contexts where they might become more important. First, networked information technology will enable a firm to contract for service delivery via telecommunications network (which would in principle generate a cross-border service transaction) rather than have that programmer move and be employed at the US office, where he would be recorded either as non-resident compensation or as a resident and therefore as part of US GDP (depending on length of stay).

Second, the ‘daylight’ between data recorded for international flows broken down by services sector and compensation flows which may not be broken down by services allows for differences in recording of the same flow of activity between originating and recipient country. For example, in 2001, US bilateral data showed imports of IT services and software from India of about \$125 million. But, Indian bilateral export data to the US recorded about \$3.7 billion in this category. Differences in definition could account for some of the difference in recorded transactions. However, it appears more likely that Indian IT workers working temporarily for Indian companies in the US are recorded as compensation by US statistical agencies, but as an export of services by the Indian statistical agencies.

Regardless, from the perspective of international prices, it would be important to know the price of the imported software activity, but also to be able to derive the relative price of software produced by the US-located programmer vs. software transmitted internationally over the Internet.

The final issue with respect to classification is the issue of bundled goods and services. Where it is not possible to unbundle the transaction, it is BEA’s practice to classify the whole transaction as either a good or a service according to where the majority of the value resides, or on the basis of the reporter’s customary practice. When there many firms engaging in these bundled transactions, there likely are few problems with this approach. However, when there are few firms, several statistical anomalies could arise. For example, when IBM switched from classifying itself as a producer of information

technology hardware to a provider of information technology services, it could have been a large enough player to alter the time trend of cross-border trade in both IT hardware and IT services.³⁸ Moreover, when software is pre-installed on IT hardware, it is recorded entirely as a transaction in a good.

Price indexes as well need to be wary of these issues, particularly as information technology itself continues to blur the distinction between trade or affiliates sales of goods and services. For example, customer service assistance using the global positioning system is bundled with automobiles, telecommunications enabled maintenance reporting systems are installed in white goods, on-line upgrading of software installed on computer hardware is commonplace, and so on.

VI: Summary, Challenges, and Possible Directions for IPP

- International transactions in services are not just cross-border: The notion of international trade in services has broadened beyond cross-border sale to sales by affiliates in destination markets as well as to the activities associated with the movement of professional persons. Classification systems have not entirely kept pace. But prices for international service transactions need to be produced for these broader frontiers of international engagement.
 - The international price program may consider creating prices that can track cross-border transactions as well as track transactions undertaken by affiliates selling to their own home market as well as to third markets abroad. These affiliate sales are growing rapidly, and the fruits of these activities should be incorporated into GNP and the ownership basis of external balance, even if not into directly GDP and the current account.
- International service transactions increasingly will be in ‘intermediate services’: The Internet and information technology, along with rising educational attainment and improved infrastructure in countries abroad, is enabling a disaggregation of services activities, leading to more trade in intermediate services across borders, by affiliates, by unaffiliated firms, and by business professionals. There are many substitution margins relevant for business strategy. These choices will impact costs and prices in the US, as well as growth, productivity, and employment in the US. Prices to measure these substitution margins for alternative strategies to produce and deliver international services are key for understanding the impact of international engagement on the United States.
 - The international price program may consider creating prices for the fastest growing set of information-technology enabled international trade in services, including business process (such as back-office accounting), technical support (call-centers), software, and financial services. These areas are also those with large categories of affiliates sales. In the area of education focusing on joint delivery of educational services abroad by US universities and growth of distance learning would be fruitful.

- Integral to the effort, the international price program may consider creating prices of intermediate inputs to these information-technology enabled trade, including wage costs by occupation, telecommunications costs, management costs, and real estate costs. With these basic inputs collected for several key source markets, a comparison of alternative sources of supply could be undertaken as new activities are offshored and outsourced.
- In addition, information on unit labor costs of business professionals (wages plus benefits adjusted for productivity) for engineers, financial consultant, programmers and some health professionals would help track business choices regarding the movement of professionals across the border.
- In regard to both movement of professional persons as well as IT-enabled international trade in services, determining what set of activities in a value chain demand professional licensing regulated by the US is very important.
- Bundling goods and services loses critical information about the nature and reason for transactions, and their implications for US economic activity. There is a tension between product-based and transactions-based classification systems. There is a tendency to bundle transactions into product categories that net out intermediate services, which underestimates the impact of international transactions in intermediate services and therefore underestimates the importance of international engagement for the dynamics of the US economy. Prices for the international service transactions that tend to be aggregated or bundled into goods are needed for an accurate assessment of international transactions in goods and services in the US economy.
 - A key category where services and goods are bundled is software, embodied in goods ranging from computers to cars. As software is increasing fragmented in production, more international transactions will be generated and will need to be priced to appreciate the full extent of software in international transactions and in US production and inflation.

End Notes

¹ The relatively higher share of services employment in private employment is consistent with the relatively lower measured labor productivity of the services sector.

² Desiree van Welsum (2004) "In Search of 'Outsourcing': Evidence from U.S. Imports of Services," mimeo, Birbeck College, London, (May).

³ The assessment of the comparative advantage of US management skills was first proposed by Irving B. Kravis and Robert E. Lipsey (1988) "The Competitiveness and Comparative Advantage of US Multinationals, 1957-1984" NBER working paper 2051 NBER: Cambridge (October).

⁴ Triplett, Jack and Barry Bosworth" (2003) Productivity Measurement Issues in Services Industries: "Baumol's Disease" Has been Cured", FRBNY Economic Policy Review, September.

⁵ Mann, Catherine (2003) "Globalization of IT services and White Collar Jobs: The Next Wave of Productivity Growth" Institute for International Economics Policy Brief (December).

⁶ A UN Expert Group met to review the draft *Manual on Statistics of International Trade in Services* in New York, from 10-12 July 2000. The Experts indicated that further work was required in areas including telecommunications, financial, and Internet-related services, as well as in the area of international trade in the context of Mode 4.

⁷ See Box 1, page 7, *Manual...* op cit.

⁸ Digitalization could mean that business may not know the residency of some activities, particularly final service sales. This issue could be solved by technology, and is related to other issues ranging from taxation and product liability to anonymity and privacy.

⁹ See Barbara M. Fraumeni, Marilyn E. Manser, Thomas L. Mesenbourg, Jr., "Government Statistics: E-Commerce and the Electronic Economy," paper prepared for presentation to the Federal Economic Statistics Advisory Committee, June 15, 2000. <http://www.census.gov/econ/www/ecom2.htm>

¹⁰ "The boundary, however, is a pragmatic issue, and cannot be drawn on the basis of some grand scheme that separates goods from services. It is probably true that too much effort has been expended on defining the boundary of goods and services, and too little effort on measuring, analyzing, enumerating, and classifying the services that will clearly fall within the boundary no matter where its precise definition. In the rest of this paper, the discussion is written as if an agreed-upon boundary, drawn on pragmatic lines, exists, and the question of determining the boundary between goods and services can be set aside." See Economic Classification Policy Committee, "Issues Paper No. 6 Services Classifications" March 1994, page 4. <<http://www.census.gov/epcd/naics/issues6>>

¹¹ See Box page 62 in Maria Borgia and Michael Mann, "U.S. International Services Cross-Border Trade in 2002 and Sales Through Affiliates in 2001," *Survey of Current Business*, October 2003.

¹² See Economic Classification Policy Committee, "Issues Paper No. 1 Conceptual Issues," February 8, 1993. <http://www.census.gov/epcd/naics/issues1>. See also, "Implications of Implementing NAICS in the Current Services Program", <http://www.census.gov/epcd/www/naicssvc.html>

¹³ Box page 68, Borgia and Mann, *op cit*.

¹⁴ See paragraph 1.13, *Manual on Statistics of International Trade in Services*, United Nations, OECD, Eurostat, IMF, UN Statistics Division, UNCTAD, WTO (2002).

¹⁵ See Box 2 page 8 *Manual on Statistics of International Trade in Services*, United Nations, OECD, Eurostat, IMF, UN Statistics Division, UNCTAD, WTO, (2002).

¹⁶ See Jemma Dridi and Kimberly Zieschang, "Compiling and Using Export and Import Price Indexes," IMF Working Paper, WP/02/230, December 2002, especially para 65-6 (page 26-27) and para 81, page 83.

¹⁷ For more, see William Alterman, "Are Producer Price Good Proxies for Export Prices?" *Monthly Labor Review*, October 1997, pp 18-32.

¹⁸ See Lorraine Eden, "Transfer Pricing, Intrafirm Trade, and the BLS International Price Program," US Department of Labor, Working Paper 334, January 2001, and W. Erwin Diewert and William F. Alterman, "Transfer Pricing and Import and Export Price Indexes: Theory and Practice," mimeo, March 13, 2003.

¹⁹ The Bureau of Economic Analysis is aware of these issues and is currently soliciting input to add questions to existing surveys and to consider new methods to capture these digital and intra-firm cross-border transactions.

²⁰ For more discussion, see chapter 8 in Catherine L. Mann, *Is the US Trade Deficit Sustainable?*, Institute for International Economics: Washington DC, 1999.

²¹ See text discussion and sources in Table 3 in Catherine L. Mann, “The US Current Account, New Economy Services, and Implications for Sustainability,” mimeo August 2003, and forthcoming *Review of International Economics* and work in progress by Jaime Marquez and Catherine L. Mann prepared for the Empirical Trade Analysis conference sponsored by the Department of Commerce, January 2004.

²² Catherine L. Mann (forthcoming), “The US Current Account, New Economy Services, and Implications for Sustainability,” *Review of International Economics*.

²³ Service transactions also include sales under military contract. These are considered out-of-scope for this discussion and analysis. The terms in ‘quotes’ are the terms used by the Bureau of Economic Analysis.

²⁴ The terms in ‘quotes’ are the classifications used by BEA.

²⁵ For instance, a transaction involving a US manufacturing company, deciding to process its customer receivables in the Philippines, would still be captured in these data, as they are categorized by transaction type, not by the sector of the multinational company.

²⁶ See Borja and Mann, op. cit. Box page 62.

²⁷ McKinsey Global Institute, “Offshoring: Is It a Win-Win Game?” August 2003.

²⁸ IDC, as reported by NASSCOM, http://NASSCOM.org/articleprint.asp?art_id/1707

²⁹ Forrester, as reported by Blue Cross-Blue Shield, “Strategic Offshore Outsourcing, March 28, 2003.

³⁰ Evaluserve, “The Economic Impact of Global Sourcing on the US 2003-2010”, October 2, 2003.

³¹ http://www.atkearney.com/shared_res/pdf/Auto_BPO_Survey_Insights_S.pdf, slide 19.

³² http://www.atkearney.com/shared_res/pdf/Auto_BPO_Survey_Insights_S.pdf, slide 11.

³³ Evaluserve, op cit. Figure 27.

³⁴ Rubin 1999 and Boston Consulting Group as referenced in slide 6 of “The Growing Export of Services from the Emerging World: Trends and Implications”, presentation to the Board, Federal Reserve Bank of New York, September 2003. McKinsey Global Institute, “Offshoring: Is It a Win-Win Game?”, August 2003, Exhibit 1.

³⁵ See Catherine L. Mann, “Globalization, IT services, and White-collar Jobs: The next wave of productivity growth,” *Policy Brief*, Institute for International Economics, December 2003.

³⁶ BEA, *US International Transactions in Private Services, A Guide to the Surveys Conducted by the Bureau of Economic Analysis*, March 1998

<<http://www.bea.gov/bea/ARTICLES/INTERNAT/INTSERV/Meth/itguide.pdf>>

³⁷ IMF, *Balance of Payments Manual 5: Annex 1*” page 77. Moreover, the one-year time frame that the US uses is by our convention not by international convention.

³⁸ See the discussion in “Globalization of Information Technology Firms and the Impact on Economic Performance”, Catherine L. Mann with Jacob F. Kirkegaard, mimeo: Institute for International Economics, August 2003, page 78.