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I. Introduction

Outsourcing of support and professional services by U. S. firms, especially goods-producing firms, has contributed to the steady increase in the service sector's share of the U.S. economy. These services include computer systems design, software production, information and data processing services, administrative and support services, and professional, scientific, and technical services. The impact of this outsourcing trend is clearly seen in the growth of the professional and business services sector, whose share of GDP increased from 8.7 percent in 1987 to 11.6 percent in 2000. Since then, however, growth has slowed in this sector, with its share of GDP declining to 11.4 percent in 2004.

While it is possible that the growth in outsourcing itself slowed after 2000, another possible explanation is that U.S. firms started to substitute imported services for domestic services as part of their outsourcing strategy. For example, in recent years imports of professional, business, and technical services, while still relatively low, have increased much faster than domestic production of these services. This increase may be part of the offshore outsourcing development that has received much attention recently from economists and policymakers. The growing importance of international transactions in services, especially services enabled by information and communications technology, has raised questions about their effect on U.S economic growth, the impact on the output and employment of domestic industries, and the implications for productivity growth.

Outsourcing as an economic activity is mostly about industry production technology and how business establishments change their input mix in response to changes in demand, relative prices, and other factors. As a result, it is best studied at the industry level using time series data on industry output, inputs, and prices. Data at the industry level are important because of the variety of ways in which outsourcing can occur. Firms can meet their needs for support and professional services by performing them in-house using the firm's own resources (own-account production), by contracting

them out to other domestic firms, or by acquiring these services from foreign sources. External suppliers can be affiliated in some way, either as domestic auxiliaries or foreign affiliates, or they can be entirely independent of the contracting firm. Industry data on input cost categories such as energy, materials, and purchased services, combined with data on labor and capital inputs, can be used to identify the industries that engage in outsourcing and to study how and why outsourcing occurs.

Systematic empirical evidence needed to address the issues raised by outsourcing is quite limited; especially evidence needed to assess the impact of offshore outsourcing on domestic industries and sectors. BEA's annual industry accounts, however, can provide some insights into how outsourcing affects domestic industries. These accounts provide consistent time series data on the composition of gross output, intermediate inputs, and value added, and quantity and price indexes, for industries classified according to the 1997 North American Industry Classification System (NAICS). The detailed time series data are available starting in 1997, and these data have recently been expanded to include estimates of energy, materials, and purchased services by industry, including information on imports of purchased services.

Studies of offshore outsourcing have primarily addressed its impact on economywide measures such as GDP, the balance of payments, aggregate employment, and business sector productivity (Borga, Government Accountability Office, Kozlow and Borga). Some studies, though, have examined the impact on industries by identifying the occupations that are most affected by outsourcing and determining which industries tend to employ those occupations (e.g., Van Welsum and Reif). One study took a different approach by determining the domestic industries that were most engaged in providing tradable services that went beyond local markets, and that were thus subject to import competition (Jensen and Kletzer). This paper extends the focus on industries by identifying the GDP-related effects of outsourcing and imported services on both the industries that provide these services and those that use them.

Using published and unpublished data from the industry accounts, along with other information on imports from BEA's national, international, and industry accounts, we will provide some insight into which industries are using imported services and how the growth of these services has affected industry value added, shares of GDP, and

industry contributions to real GDP growth. We also anticipate that this work will allow us to identify data sources and estimation methods for improving the allocation of imported purchased services by commodity and industry.

The objectives of this paper include:

- Explaining the treatment of imported services in BEA's international, national, and industry accounts;
- Describing BEA's new framework for measuring purchased services in the industry accounts, including the role of the integrated industry accounts;
- Identifying the growth of purchased services as an intermediate input and the effect of imports on that growth, especially since 1997;
- Describing research using BEA company data to improve the estimates of imported purchased services by industry.

Overview of Findings

Imports of services in the U.S. economy exceeded \$300 billion in 2004 and accounted for nearly 17 percent of total U.S. imports, including merchandise. Imports of professional, business, and technical services, the category most associated with outsourcing, increased rapidly after 1997 but still accounted for less than 16 percent of total imported services. Moreover, only a small portion of these services are classified as comparable to domestic production in the industry accounts and thus compete with similar domestic services in the outsourcing market.

Despite their small size, imports of intermediate purchased services increased slightly as a share of total intermediate purchased services, from 2.8 percent in 1997 to 3.0 percent in 2003. These services include those closely associated with outsourcing but also include other purchased services such as transportation, communications, and finance and insurance. Among private industry groups in 2003, the import share of purchased services exceeded 3.0 percent in manufacturing, transportation and warehousing, and finance, insurance, real estate, rental and leasing.

The small size of these imports, especially those that compete with domestic production, suggests that import competition has played a very small role, if any, in the slower growth since 2000 of the domestic professional and business services

(outsourcing) sector. Slower real output growth and employment reductions in this sector are probably better explained by the recession of 2001 and the overall decline of the information and communications technology sector. Further study is required to develop a better understanding of the impact of imported services on industry output, employment, and contributions to GDP. Research is needed using company-based data to evaluate the assumptions underlying the distribution of imported purchased services in the industry accounts.

Outline of the Article

The remainder of this article is presented in four sections. Section II discusses the treatment of imports in BEA's international, national, and industry accounts, with a focus on imported services. Section III discusses the treatment of purchased services generally in BEA's production-oriented industry accounts and how imported services are handled within this framework. This section also includes empirical results on the industry distribution of imported services and their impact on measures of real growth. Section IV presents an evaluation of the methodology based on unpublished data from BEA's international accounts, and provides some options for improving the industry estimates of imported purchased services. Section V is a summary and conclusion.

II. Imports in BEA's Accounts

This section provides an overview of how imported services are defined and classified in BEA's international, national, and industry accounts. It begins with the international transactions accounts (ITAs) where these transactions are initially recorded, proceeds to the national income and product accounts (NIPAs), and then moves on to the annual industry accounts (AIAs). Differences among these accounts in concepts and coverage are described and the relationships among the flows in the accounts are briefly explained. Understanding the relationships among these three accounts is important because imported services originate in the ITAs but flow through the NIPAs before finding their place in the industry accounts.

A. International Transactions Accounts

BEA's international transactions accounts provide monthly, quarterly and annual estimates of transactions between U.S. and foreign residents.¹ The ITAs include the current account, the capital account, and the financial account. The two major components of the current account are (1) exports of goods and services and income receipts and (2) imports of goods and services and income payments. The difference between these two components, plus net unilateral current transfers, equals the balance on current account. The capital account includes capital transfers such as debt forgiveness. The two major components of the financial account are (1) net U.S.-owned assets abroad and (2) net foreign-owned assets in the U.S. Changes in these components reflect changes in the U.S. net international investment position.

Imports of services in the current account are estimated from a variety of sources, primarily BEA's own direct investment surveys of U.S. and foreign multinational corporations (MNCs) and other surveys of business enterprises. Quarterly estimates of imported services are published for seven broad categories that represent types of services transactions. These categories are direct defense expenditures, travel, passenger fares, other transportation, royalties and license fees, other private services, and U.S. government miscellaneous services. Direct defense expenditures include some goods (mainly materials), supplies, and petroleum products purchased abroad by U.S. military agencies. Other transportation includes some fuels purchased by airline and steamship operators. Additional detail is provided annually.

BEA's direct investment surveys are mandatory and collect selected financial and operating data for the U.S. parents of multinational corporations, their foreign affiliates, and the U.S. affiliates of foreign MNCs. Both sets of surveys also collect data on international transactions between affiliated parties. These data play an important role in compiling the ITAs and are supplemented with data on transactions between unaffiliated parties to provide a full picture of U.S. international transactions. Because U.S. MNCs are typically very large firms, the combined data for U.S. parents and U.S. affiliates accounts for a significant share of domestic economic activity, especially in the goods-producing sector of the economy. These combined company-based industry data can

¹ Transactions between the U.S. and its territories, Puerto Rico, and the Northern Mariana Islands are not treated as foreign transactions in the ITAs.

provide valuable insights into the industry distribution of imported purchased services and are discussed in more detail in Section IV.

B. National Income and Product Accounts

BEA's national income and product accounts (NIPAs) provide quarterly and annual estimates of U.S. production, income, consumption, investment, and saving. The NIPAs include sub-accounts for domestic product and income, personal income and outlays, government current receipts and expenditures, foreign transactions, and saving and investment. The featured measure from these accounts is GDP, which is a measure of the market value of final goods and services produced in a period. The major categories of final expenditures, which sum to GDP, are personal consumption expenditures, gross private domestic investment, net exports of goods and services, and government consumption expenditures and gross investment.

Net exports are defined as exports less imports. Estimates of goods and services are provided separately for exports and for imports. In calculating GDP as the sum of final expenditures, all imports are subtracted without regard to whether they are consumed in final uses (e.g., as personal consumption expenditures) or in intermediate uses by U.S. industries (e.g., as purchased services or materials). Current-dollar (nominal) imports in the NIPAs are valued in producers' prices, which include payments to foreign suppliers, transportation costs needed to reach the U.S., and import duties. Quantity and price indexes are prepared quarterly and annually for exports and for imports.

Foreign transactions in the NIPAs are shown in more detail in the sub-accounts that start with NIPA table 4.1. The relation of foreign transactions in the NIPAs to the corresponding items in the ITAs is shown in NIPA table 4.3B. Imports of services in the NIPAs are slightly larger than in the ITAs, mostly because of a territorial adjustment that treats purchases by U.S. residents from U.S. territories and Puerto Rico as imports rather than transactions between domestic parties. Imports of services in the NIPAs are shown for the same seven broad categories of transactions that appear quarterly in the ITAs. The NIPA foreign transactions accounts also provide price quantity and price indexes for the seven categories of services from the ITAs.

C. Annual Industry Accounts

BEA's annual industry accounts (AIAs) include the integrated GDP-by-industry and annual input-output (I-O) accounts. Industries are defined according to the North American Industry Classification System (NAICS). Estimates are published for 61 private industries and for four government classifications. The GDP-by-industry accounts feature value added by industry estimates. Value added is defined as an industry's gross output (sale or receipts and other operating income) minus its intermediate inputs (energy, materials, and purchased services). Intermediate inputs can be obtained from either domestic or foreign sources (imports). Price and quantity indexes of gross output, intermediate inputs, and value added are published for industries, industry groups, and broad sectors.

The annual I-O accounts provide a time series of detailed, consistent information on the flows of goods and services that comprise industry production processes. The I-O accounts are presented in standard make and use tables and several supplementary tables. The make table shows the commodities (goods and services) that are produced by each industry. The use table shows the commodity inputs to industry production and the commodities that are consumed by final users. Commodities are shown along the rows and industries and final uses are shown in the columns. (See figure 1.) Total commodity output in the right-most column represents total domestic production of each commodity. The total domestic supply of each commodity (not shown) is the sum of total commodity output less exports (X) plus imports (M), with the sign reversed. Commodity supply is completely exhausted in final uses (GDP) and in intermediate uses by industries. Since commodity uses include imports, the inclusion of imported commodities as a column vector of negative values insures that all imports are subtracted in the final uses measure of GDP.

The supply of imports for each commodity is calculated as part of preparing the estimates for the AIAs. Import categories from the NIPAs for both goods and services are disaggregated and distributed among the detailed commodities that comprise the rows of the I-O use table. The commodity composition of the import categories is determined in the benchmark I-O accounts, which are prepared every five years using detailed data

Figure 1. -- Input-Output Use Table

		INDUSTRIES									FINAL USES (GDP)							TOTAL COMMODITY OUTPUT	
		Agriculture	Mining	Construction	Manufacturing	Transportation	Trade	Finance	Services	Other	Total Intermediate Use	PCE	PFI	CBI	X	M	GOVT	GDP	
COMMODITIES	Agriculture																		
	Minerals																		
	Construction																		
	Manufacturing																		
	Transportation																		
	Trade																		
	Finance																		
	Services																		
	Other																		
	Noncomparable imports																		
	Total Intermediate inputs																		
VALUE ADDED	Compensation																		
	TOPI																		
	Gross operating surplus																		
	Total																		
TOTAL INDUSTRY OUTPUT																			

Abbreviations: PCE–personal consumption expenditures; PFI–private fixed investment; CBI–change in business inventories; X–exports; M–imports; TOPI–taxes on production and imports

from the economic censuses. When commodities are allocated among final and intermediate uses, however, no distinction is made based on the source of the commodity. Imports are combined with domestic production and allocated among uses. As a result, the estimates of intermediate inputs in the industry accounts include imports, but no data are available to indicate how much of intermediate consumption comes from imports.

In the GDP-by-industry accounts, however, a distinction is made between imports and domestic production for calculating each industry's quantity and price indexes for intermediate inputs as part of the double-deflation method used to calculate real value added. This distinction is made solely because separate price indexes are available for some imported commodities, either from the Bureau of Labor Statistics (BLS) International Price Index (IPI) program or from the NIPAs. In each cell of the use table, the nominal value of each commodity is split between imports and domestic production in proportion to the share of imports in the total supply of the commodity. For example, if imports represent 50 percent of the total supply of semiconductors, then the AIAs assume that imports comprise 50 percent of the total value of the semiconductors used by an industry in its production process. These import shares are first developed for the benchmark use table using very detailed product data and they are updated annually at the same level of product detail.² Variation in the estimated use of imports by industry is due to variation in the commodity composition of intermediate inputs and variation in the commodity import shares.

An important part of the process of allocating imported commodities to using industries is the translation of ITA and NIPA import categories, which are primarily types of expenditures or transactions, to the commodity detail used for the production-oriented industry accounts. For the benchmark I-O accounts, detailed annual data on types of purchased services from company surveys conducted for the ITAs are used to assign imported services to specific commodities. These assignments may be straightforward based on the nature of the service, or they may be indirect with allocation among several commodities based on historical relationships. Direct defense expenditures and other government services are allocated entirely to government. The allocation of categories

² BEA has prepared an import matrix for 1997 that is supplementary to the 1997 benchmark I-O accounts using similar assumptions about the use imported commodities, but the valuation of imports in this matrix is slightly different than in the industry accounts. For more information, see the BEA web site.

such as passenger fares and other transportation is limited to a small number of transportation services commodities.

A significant portion of imported services, however, has no direct domestic counterpart, either because of the location of the service, its specialized nature, or the relationship of the supplier to the customer. These imports, which require special treatment in the use table, are classified as “noncomparable” imports and are shown as a single, separate commodity row.³ The table below shows the translation of total imported services for 2003.

Translation of Imported Services in the NIPAs to Comparable
Commodities in the Annual Industry Accounts, 2003
(Billions of dollars)

Imports of services, NIPAs	262.3
Less: Coverage adjustment	1.6
Less: Definitional adjustment	33.1
Equals: Imports of services, AIAs	227.6
Less: Noncomparable imports	170.2
Equals: Comparable imports	57.4

Noncomparable imports, which have accounted for about three-fourths of imported services in recent years, consist mostly of personal and business travel abroad by U.S. residents and purchases of services produced and consumed abroad. Categories such as travel, direct defense expenditures, and royalties and license fees are assigned almost entirely to noncomparable imports. The other private services and other services categories are allocated to a wider variety of services commodities, but a significant portion is also allocated to noncomparable imports. For example, about 85 percent of business, professional, and technical (BPT) services, the largest component of other private services, was allocated to noncomparable imports in 2003 because of the highly specialized nature of the services provided by foreign affiliates to their U.S. parent.

³ Some imported services are classified as noncomparable for special treatment because information is available that allows for a more reliable distribution among industries. Portions of these services may be comparable to domestic production.

III. Purchased Services in BEA's Industry Accounts

BEA's annual industry accounts include the integrated GDP-by-industry and annual input-output (I-O) accounts. The annual I-O accounts provide a time series of detailed, consistent information on the flows of goods and services that comprise industry production processes. Estimates of the supply of commodities are prepared at the same level of detail as in the benchmark I-O accounts and are aggregated to the less detailed published level for the annual industry accounts. These time series are estimated within the framework of balanced supply and use tables and are consistent with NIPA estimates of final expenditures and industry estimates of gross output and value added. These additional layers of internal consistency increase the overall reliability of the estimates of intermediate inputs by industry in the annual industry accounts.

The AIAs were recently expanded to provide additional information on the composition of intermediate inputs by industry and these accounts can now be used to study trends in the use of purchased inputs, such as outsourcing. The balanced I-O use table, which shows the commodity composition of intermediate inputs by industry and by final demand category, provides the commodity detail needed for aggregating estimates of intermediate inputs into cost categories that are important for economic analysis. The product detail underlying the industry estimates of intermediate inputs has been aggregated into three cost categories—energy, materials, and purchased services. These estimates were prepared by applying a KLEMS production framework to BEA's estimates of industry production.⁴ Each of these three cost categories includes both imported and domestically-produced goods and services. Intermediate inputs are valued in purchasers' prices, which include domestic transportation costs and wholesale trade margins plus sales and excise taxes.

The NAICS industry classification system that is used for the AIAs also provides advantages for studying outsourcing in the U.S. economy. NAICS improves on the SIC as a classification system because it more consistently classifies establishments into industries on the basis of similar production processes, it recognizes new and emerging industries, and it provides greater detail for the services sector, which includes the industries that provide outsourcing services. Unlike the SIC system, NAICS provides

⁴ See Strassner, Medeiros, and Smith.

separate publication-level industry groups for the Information sector and for the Professional and business services sector. In addition, under NAICS establishments that primarily provide support services to other establishments of the same company (auxiliaries) are classified according to the service they provide, rather than according to the industry of the establishments they serve, as they were under the SIC. Most such auxiliaries are classified in the NAICS professional and business services sector.

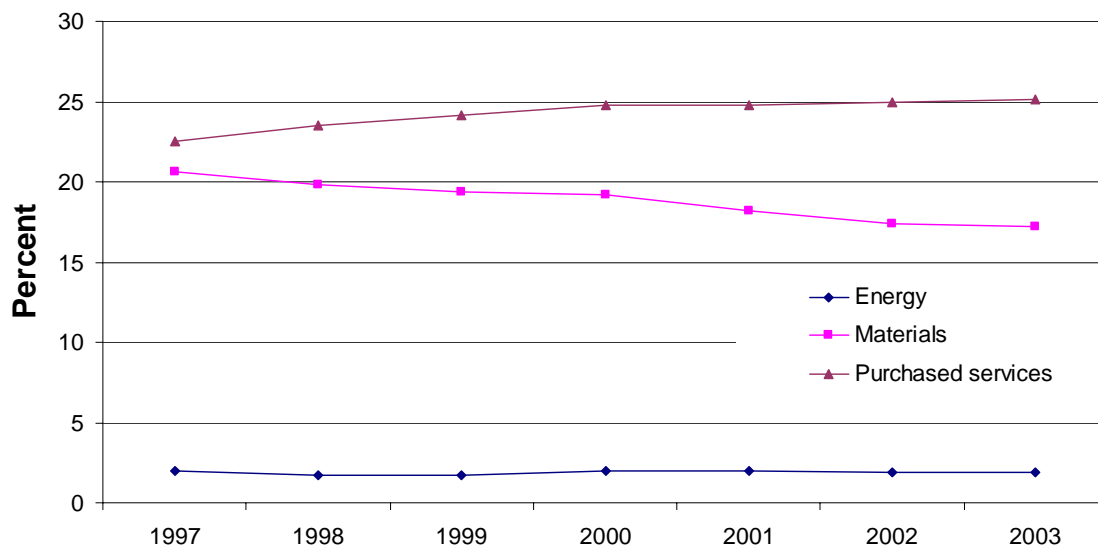
A. Purchased Services Inputs

Steady outsourcing of support and professional services has contributed to the increase in the service sector's share of the U.S. economy. These services are largely consumed by other businesses as intermediate inputs. Outsourcing increased significantly during the restructuring that accompanied recovery from the recessions of the early 1980's. The impact of the outsourcing trend is clearly seen in the growth of the professional and business services sector, whose share of GDP increased from 8.7 percent in 1987 to 11.6 percent in 2000, dropping slightly to 11.4 percent in 2004.

The newly-expanded integrated AIAs allow the growth of outsourcing to be studied more closely after 1997 because these accounts provide consistent data on gross output, intermediate input cost categories, value added, and price and quantity indexes starting with that year. In each year from 1997 to 2003, each dollar of gross output represented a higher percentage of purchased services. The increases after 2000, however, were much smaller than those between 1997 and 2000. Purchased services inputs as a percentage of gross output increased from 22.5 percent in 1997 to 25.1 percent in 2003. (See figure 2 and table 1.) The trend applied, although not necessarily in each year, to both private goods-producing industries, which include manufacturing, and private services-producing industries. For goods-producing industries the purchased-services share increased from 15.1 percent to 16.6 percent, but it became flat after 2001. For services-producing industries the share increased from 26.9 percent to 28.9 percent, flattening out after 2000.

Not all of the growth in the share of purchased services inputs, of course, is due to outsourcing. Because no consensus exists on exactly which types of purchased services constitute outsourcing, this study includes all of the services produced by the professional

Figure 2. Intermediate Inputs as a Percentage of All Industries Gross Output



and business services sector and selected services produced by the information sector.⁵ For the most part, these are the types of administrative, support, and professional services that firms can choose to either produce in-house or contract out to external suppliers. More than 80 percent of these services are consumed by other industries as intermediate inputs. Moreover, these are the types of services most vulnerable to import competition because recent advances in information and communications technology have enabled foreign suppliers to provide the services more effectively and at lower cost.

In both 1998 and 2003, outsourcing services as defined for this study accounted for about 45 percent of all purchased services consumed as intermediate inputs. Outsourced services are clearly very important in the cost structure of domestic industries, but they do not appear to be growing faster than other types of purchased services such as communications, financial services, real estate, rental and leasing, repair services, accommodations, and food and beverage services. These latter types of services, however, are usually not performed in-house and are not as likely as outsourcing-related services to face competition from imports.

⁵ NAICS commodities 5112 (software), 514 (information and data processing services), 54 (professional, scientific, and technical services), 55 (management of companies and enterprises), and 56 (administrative and support services and waste management and remediation services) are included. Data for the professional and business services sector (NAICS 54-56) is used as a proxy for the “outsourcing” sector.

The growth in purchased services inputs as a share of gross output after 1997 may be due to faster growth in the relative prices of services inputs, faster growth in the use of purchased services relative to other inputs, or a combination of these two factors. Faster growth in the *use* of purchased services is a better indicator of possible outsourcing because it implies changes in the production process, rather than changes in the relative prices of inputs. The approximate contributions of these two factors can be found using the KLEMS-based price and quantity indexes from the AIAs. From 1997-2003, the quantity index of purchased-services inputs for all industries increased at an average annual rate of 4.9 percent compared to 3.1 percent for gross output, implying some substitution of purchased services for other inputs. Prices for purchased services inputs increased only slightly faster than gross output prices (1.5 percent vs. 1.4 percent). These differences suggest that the growth in the share of purchased services reflects substitution among inputs more than changes in the relative prices of inputs.

B. Imported Services Inputs

Purchased services can be provided either by resident suppliers (domestic production) or by foreign suppliers (imports). The rapid growth in the ITAs and the NIPAs of the other private services category, which includes business, professional, and technical (BPT) services, suggests that offshore suppliers have not only contributed to the growth of outsourcing in the U.S., but may have gained market share at the expense of domestic suppliers. From 1997 to 2003, imported BPT services increased at an average annual rate of 11.5 percent, nearly doubling from \$21.2 billion to \$40.8 billion. By comparison, domestically-produced professional and business services increased at an average annual rate of seven percent. The growth of imported BPT services was about the same as the broader category of other private services, which also includes financial services, insurance services, and telecommunications. By 2003, nearly three-fourths of the dollar value of imported BPT services transactions took place between affiliated parties, purchased either by U.S. parents from their overseas affiliates or by the U.S. affiliates of foreign multinational corporations.

While the import and domestic categories are not exactly comparable, the differences in growth rates suggest that imports increased as a share of the supply of professional and business services in the U.S. during this period. As described in the

previous section, however, not all of the imported services in the ITAs and the NIPAs are equivalent to domestic intermediate services in the industry accounts. About one-third of purchased services imports in 2003 were classified as final uses⁶ and about three-fourths of the intermediate uses were classified as noncomparable imports. This section identifies the industries that are using imported intermediate services, describes how their use has changed since 1997, and provides some preliminary measures of the impact on industry value added and contributions to GDP growth.

1. Industries Using Imported Services

In the industry accounts, imports classified as services increased from \$161 billion in 1997 to \$227 billion in 2003. Imported services for intermediate use grew slightly faster, increasing from \$96 billion to \$151 billion. Imports as a share of intermediate purchased services, while still very low, increased from 2.8 percent to 3.0 percent over this period. The three largest imported services and their shares of total imported services in 2003 were noncomparable imports (74 percent), insurance carriers and related activities (14 percent), and miscellaneous professional, scientific, and technical services (5 percent). Imports of transportation services accounted for most of the remainder. Professional and business services plus selected information services that are associated with outsourcing amounted to \$9.4 billion in 2003.

Table 2 shows the dollar levels of imported purchased services by industry group for selected years, and table 3 shows the percent distribution of industry purchases of imported services. In 2003, finance and insurance consumed the most (\$32.4 billion), followed by federal general government (\$22.3 billion), transportation and warehousing (\$20.5 billion), durable goods manufacturing (\$17.0 billion), and nondurable goods manufacturing (\$14.8 billion). Table 3 indicates that some change took place in the industry distribution of imported purchased services over this period. Shares increased for the federal government and for finance and insurance and declined for transportation and warehousing and for information. Manufacturing's share slightly increased.

Another way of identifying industry groups that are significant users of imported purchased services is by examining the share of intermediate purchased services

⁶ This includes software for both personal use and business investment, which accounted for 60 percent of the final uses of information, professional and business services.

accounted for by imports. This “import intensity” is calculated by dividing an industry’s imported purchased services by its total use of intermediate purchased services (table 4). In 2003, import intensities ranged from a high of 10.7 percent for transportation and warehousing to a low of 0.3 percent for health care and social assistance. Private industry groups with relatively high import intensities include finance and insurance, wholesale trade, and manufacturing. Increases in this share over time may indicate that imports are being substituted for domestic output. For private goods-producing industries, the import intensity increased from 2.9 percent in 1997 to 3.8 percent in 2003, almost entirely due to the growth in manufacturing. Import intensity did not change overall for private services-producing industries.

2. Impact on Value Added and Contributions to Growth

If U.S. firms have in fact substituted imports for domestic production as part of outsourcing since 2000, then we should observe some effect on the output and value added of the U.S. industries that provide these services. Nominal and real gross output for the professional and business services sector, which includes auxiliaries, increased rapidly from 1997-2000 but slowed considerably after 2000. Real value added increased more slowly than all private services industries and GDP. Prices also grew more slowly than in the rest of the economy. As a result, the share of GDP originating in the outsourcing sector declined slightly after 2000 and the shares of GDP originating in the sectors that use these services increased slightly. It is not clear, though, how much of this decline was due to the overall downturn in the economy after 2000.

The growth of purchased services as a share of gross output for U.S. industries, at least for the period 1997-2003, has primarily been due to the substitution of purchased services for other inputs, rather than relative price change. Of course, substitution of purchased services may itself have been induced by changes in relative prices, especially changes in the price of labor services. But we have also seen, within the category of purchased services, a modest substitution of imports for domestic production. This section examines the growth in the share of imported purchased services in more detail by looking at the contributions of imported services to the real growth of purchased services, intermediate inputs, and gross output by industry. Aggregating these effects over all industries provides approximate measures of the contributions of imports to the

real growth in aggregate gross output. This framework can also be used, with simplifying assumptions, to simulate the effects of alternative scenarios for the growth of offshore outsourcing on industry output and employment and GDP growth. [This analysis is currently in progress.]

IV. Evaluating the Methodology

This section presents initial results from evaluating the assumptions and procedures used by BEA to prepare estimates of imported purchased services in the industry accounts. These assumptions and procedures affect the classification of imported services, the allocation between intermediate and final use, the distribution of imported services by using industry, and the deflation of imported purchased services. Background is first provided on the data collected by BEA for the U.S parents of multinational corporations and for the U.S. affiliates of foreign MNCs. These two data sets combined provide very useful information about the distribution of imported services and are supplemented with data from BEA's surveys of transactions between unaffiliated parties. This section also briefly discusses the price indexes used to deflate imported purchased services and possible improvements.

- A. Results from analysis of IID company data*
- B. Alternative assumptions about import distributions*
- C. Price indexes used for deflation*
- D. Possible improvements in the industry accounts*

V. Summary and Conclusion

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Table 1. Components of Current-Dollar Gross Output by Industry Group as a Percentage of Gross Output

	1997	1998	1999	2000	2001	2002	2003
All Industries	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Value Added	54.8	55.0	54.8	54.0	55.0	55.7	55.8
Compensation of employees	30.8	31.6	31.7	31.8	32.3	32.3	31.9
Taxes on production and imports less subsidies	3.8	3.8	3.7	3.7	3.7	3.9	3.8
Gross operating surplus	20.2	19.6	19.4	18.5	19.1	19.6	20.1
Intermediate inputs	45.2	45.0	45.2	46.0	45.0	44.3	44.2
Energy inputs	2.0	1.7	1.7	2.0	2.0	1.9	1.9
Materials inputs	20.6	19.8	19.4	19.2	18.2	17.4	17.2
Purchased-services inputs	22.5	23.5	24.1	24.8	24.8	25.0	25.1
Private goods-producing industries¹	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Value Added	37.2	38.1	37.8	38.0	38.4	39.1	39.9
Compensation of employees	22.0	23.0	23.2	23.7	24.2	24.5	24.2
Taxes on production and imports less subsidies	1.1	0.9	0.8	0.8	0.9	1.1	1.1
Gross operating surplus	14.2	14.1	13.8	13.5	13.3	13.4	14.5
Intermediate inputs	62.8	61.9	62.2	62.0	61.6	60.9	60.1
Energy inputs	1.9	1.6	1.6	1.7	1.8	1.6	1.7
Materials inputs	45.8	44.8	44.7	44.6	43.2	42.5	41.8
Purchased-services inputs	15.1	15.5	15.9	15.7	16.7	16.7	16.6
Private services-producing industries²	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Value Added	63.0	62.3	62.0	60.4	61.6	62.1	61.9
Compensation of employees	31.4	32.1	32.2	32.2	32.4	32.0	31.6
Taxes on production and imports less subsidies	6.3	6.2	6.0	5.8	5.7	5.9	5.9
Gross operating surplus	25.3	24.1	23.8	22.4	23.4	24.2	24.5
Intermediate inputs	37.0	37.7	38.0	39.6	38.4	37.9	38.1
Energy inputs	1.9	1.6	1.6	1.9	1.8	1.7	1.8
Materials inputs	8.3	8.1	7.9	8.0	7.7	7.4	7.4
Purchased-services inputs	26.9	27.9	28.5	29.7	28.9	28.8	28.9

1. Consists of agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.

2. Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, real estate, rental, and leasing; professional and business services; educational services, health care, and social assistance;

**Table 2. -- Imported Purchased Services by Industry Group, Selected Years
(Billions of dollars)**

	Industry Group	1997	2000	2003
1	All Industries	96.3	130.4	150.9
2	Private Industries	83.9	116.1	127.4
3	Agriculture, forestry, fishing, and hunting	0.1	0.2	0.2
4	Mining	0.8	1.1	1.2
5	Utilities	0.2	0.2	0.2
6	Construction	0.8	1.0	1.1
7	Manufacturing	19.5	25.1	31.8
8	Nondurable goods	8.5	13.0	14.8
9	Durable goods	11.0	12.2	17.0
10	Wholesale Trade	6.6	9.0	10.3
11	Retail Trade	0.9	1.4	1.4
12	Transportation and warehousing	17.2	20.8	20.5
13	Information	11.7	10.5	11.0
14	Finance, insurance, real estate, rental, and leasing	18.3	35.0	37.4
15	Finance and insurance	15.4	28.1	32.4
16	Real estate and rental and leasing	2.9	6.9	5.0
17	Professional and Business Services	5.8	9.3	9.7
18	Professional, scientific, and technical services	4.3	6.9	7.6
19	Management of companies and enterprises	0.4	0.5	0.5
20	Administrative and waste management services	1.1	1.9	1.7
21	Educational services, health care, and social assistance	0.9	1.2	1.2
22	Educational services	0.2	0.4	0.3
23	Health care and social assistance	0.6	0.8	0.9
24	Arts, entertainment, recreation, accommodation, and food services	0.6	0.8	0.8
25	Arts, entertainment, and recreation	0.2	0.2	0.2
26	Accommodation and food services	0.5	0.7	0.6
27	Other services, except government	0.4	0.7	0.6
28	Government	12.3	14.2	23.5
29	Federal government	11.5	13.0	22.3
30	State and local government	0.8	1.2	1.2
	Addenda			
31	Private goods-producing industries/1/	21.3	27.3	34.3
32	Private services-producing industries/2/	62.6	88.8	93.1

1. Consists of agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.

2. Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, real estate, rental, and leasing; professional and business services; educational services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.

**Table 3.-- Distribution of Imported Purchased Services
by Industry Group, Selected Years
(percent)**

	Industry Group	1997	2000	2003
1	All Industries	100.0	100.0	100.0
2	Private Industries	87.2	89.1	84.4
3	Agriculture, forestry, fishing, and hunting	0.1	0.1	0.1
4	Mining	0.9	0.8	0.8
5	Utilities	0.2	0.1	0.1
6	Construction	0.9	0.7	0.7
7	Manufacturing	20.3	19.3	21.1
8	Nondurable goods	8.8	9.9	9.8
9	Durable goods	11.4	9.3	11.3
10	Wholesale Trade	6.8	6.9	6.8
11	Retail Trade	1.0	1.1	0.9
12	Transportation and warehousing	17.8	15.9	13.6
13	Information	12.2	8.0	7.3
14	Finance, insurance, real estate, rental, and leasing	19.0	26.9	24.8
15	Finance and insurance	16.0	21.6	21.5
16	Real estate and rental and leasing	3.1	5.3	3.3
17	Professional and Business Services	6.0	7.1	6.4
18	Professional, scientific, and technical services	4.5	5.3	5.0
19	Management of companies and enterprises	0.4	0.4	0.3
20	Administrative and waste management services	1.2	1.5	1.1
21	Educational services, health care, and social assistance	0.9	0.9	0.8
22	Educational services	0.2	0.3	0.2
23	Health care and social assistance	0.6	0.6	0.6
24	Arts, entertainment, recreation, accommodation, and food services	0.7	0.6	0.6
25	Arts, entertainment, and recreation	0.2	0.1	0.1
26	Accommodation and food services	0.5	0.5	0.4
27	Other services, except government	0.4	0.5	0.4
28	Government	12.8	10.9	15.6
29	Federal government	11.9	10.0	14.8
30	State and local government	0.9	1.0	0.8
	Addenda			
31	Private goods-producing industries/1/	22.1	21.0	22.7
32	Private services-producing industries/2/	65.1	68.1	61.7

1. Consists of agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.

2. Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, Real estate, rental, and leasing; professional and business services; educational services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.

**Table 4.-- Imported Purchased Services as a Share of Total Purchased Services
by Industry Group, Selected Years
(in percent)**

	Industry Group	1997	2000	2003
1	All Industries	2.8	2.9	3.0
2	Private Industries	2.7	2.9	2.9
3	Agriculture, forestry, fishing, and hunting	0.2	0.4	0.3
4	Mining	2.6	2.6	2.6
5	Utilities	0.7	0.7	1.3
6	Construction	0.9	0.8	0.8
7	Manufacturing	3.5	3.9	4.9
8	Nondurable goods	3.5	4.4	4.9
9	Durable goods	3.5	3.4	4.8
10	Wholesale Trade	3.9	4.3	5.0
11	Retail Trade	0.5	0.5	0.5
12	Transportation and warehousing	10.0	10.4	10.7
13	Information	4.7	2.6	2.4
14	Finance, insurance, real estate, rental, and leasing	2.6	3.5	3.6
15	Finance and insurance	3.7	4.5	6.0
16	Real estate and rental and leasing	1.0	1.9	1.0
17	Professional and Business Services	1.7	1.7	1.5
18	Professional, scientific, and technical services	2.3	2.3	2.0
19	Management of companies and enterprises	0.4	0.5	0.5
20	Administrative and waste management services	1.4	1.4	1.1
21	Educational services, health care, and social assistance	0.3	0.4	0.3
22	Educational services	0.6	0.7	0.5
23	Health care and social assistance	0.3	0.3	0.3
24	Arts, entertainment, recreation, accommodation, and food services	0.5	0.6	0.5
25	Arts, entertainment, and recreation	0.4	0.4	0.4
26	Accommodation and food services	0.6	0.6	0.5
27	Other services, except government	0.5	0.6	0.5
28	Government	3.4	3.2	4.0
29	Federal government	9.3	9.0	10.0
30	State and local government	0.4	0.4	0.3
	Addenda			
31	Private goods-producing industries/1/	2.9	3.2	3.8
32	Private services-producing industries/2/	2.7	2.8	2.7

1. Consists of agriculture, forestry, fishing, and hunting; mining; construction; and manufacturing.

2. Consists of utilities; wholesale trade; retail trade; transportation and warehousing; information; finance, insurance, Real estate, rental, and leasing; professional and business services; educational services, health care, and social assistance; arts, entertainment, recreation, accommodation, and food services; and other services, except government.