

BEA BRIEFING

Supply-Use Tables for the United States

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AS PART OF its ongoing efforts to enhance the relevance of the industry economic accounts (IEAs), the Bureau of Economic Analysis (BEA) plans to begin releasing supply-use tables annually. These tables will be included as part of the annual revision of the IEAs, which typically is released every November.¹

These supply-use tables will provide an integrated presentation of the total domestic supply of goods and services from both domestic and foreign producers and the use of this supply across the U.S. economy. These new tables will not replace any current BEA products. Instead, they will be a new, supplemental product that augments current IEA statistics.

Broadly speaking, the IEAs enable economists and others to study the internal workings of the U.S. economy, detailing in particular the contribution of specific industries and commodities to gross domestic product (GDP). These statistics measure and analyze the production of goods and services by industry, detailing the flows of goods and services purchased by each industry, the incomes earned from production in each industry, and the distribution of sales for each commodity.

Input-output (I-O) accounts have long been an essential component of the IEAs, underpinning all statistics and providing an accounting framework for developing measures of gross domestic product and other important indicators.²

Various frameworks can be used to present I-O accounts. BEA's featured set of accounts have traditionally been prepared using a make-use approach. This approach is similar to the supply-use approach recom-

mended by global economic accounting standards, specifically the *System of National Accounts 2008*.

The supply-use approach has recently generated additional attention in part due to its applicability in analyzing global value chains (GVCs) and globalization in general.³ In particular, trade-in-value-added (TiVA) statistics, in which GVCs are disaggregated into the value added contributed by each industry within each country across the global supply chain, are increasingly used for this purpose.⁴ TiVA statistics are based on a large economic data infrastructure in which national I-O tables are linked together through bilateral international trade flows.

The publication of the new BEA supply-use tables marks the latest step in a long-standing effort to modernize and to improve the IEAs. These improvements have included an accelerated release schedule for the I-O accounts, full integration of the benchmark and annual I-O accounts with the annual statistics on GDP by industry and the national income and product accounts (NIPAs), and an expansion of the IEAs to include new products, such as quarterly GDP by industry statistics, the arts and cultural production satellite account, and the integrated industry-level production account, which is produced jointly by BEA and the Bureau of Labor Statistics.⁵

Looking ahead, BEA and international partners, such as the Organisation for Economic Co-operation and Development (OECD) and the Asia-Pacific Economic Cooperation, plan to develop extended supply-use tables.⁶ These extended tables will incorporate firm-level heterogeneity and other features into existing supply-use tables, which will allow for more

1. The release includes the integrated GDP by industry and I-O accounts and typically includes revised statistics for the 3 most recent years; for example, in November 2015, BEA will release the results of its annual revision of the IEAs for 2012–2014.

2. I-O tables have long been a core accounting framework for producing national economic accounts, with roots in a 1947 report prepared under the leadership of Richard Stone by a subcommittee of the League of Nations Committee of Statistical Experts. For the most recent update of international guidelines, see Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, and the World Bank, *System of National Accounts 2008* (Brussels/Luxembourg, New York, Paris, and Washington, DC, 2009).

3. See Houseman and Mandel (2015).

4. Official TiVA statistics are produced through a joint effort by the Organisation for Economic Cooperation and Development (OECD) and the World Trade Organization. For more details, see *Measuring Trade in Value Added* on the OECD Web site.

5. See Strassner and Wasshausen (2014), Kim, Strassner, and Wasshausen (2014), Fleck, Rosenthal, Russell, Strassner, and Usher (2014), Kern, Wasshausen, and Zemanek (2015), and Lawson, Moyer, Okubo, and Planting (2006).

6. See OECD Expert Group on Extended Supply-Use Tables, "Draft: Terms of Reference" (2015).

accurate TiVA statistics as well as a better understanding of how much of the value added created within an economy is captured domestically or is repatriated to other countries. Work to develop these extended supply-use tables is being undertaken by BEA in collaboration with the Census Bureau.

The remainder of this briefing consists of three sections. The first section describes the supply-use framework. The second section details the methodology used to develop supply-use tables for the United States. The third section concludes with next steps to further harmonize the IEAs with international guidelines.

The Supply-Use Framework

The supply-use framework comprises two tables. The supply table presents the total domestic supply of goods and services from both domestic and foreign producers that are available for use in the domestic economy. The use table shows the use of this supply by domestic industries as intermediate inputs and by final users as well as value added by industry.

The supply table

Table 1 is a sector-level supply table. The table comprises two parts: a domestic supply at basic prices

Table 1. The Supply of Commodities, 2013

[Millions of dollars]

Commodities/Industries	Industries												
	Agriculture, forestry, fishing, and hunting	Mining	Utilities	Construction	Manufacturing	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
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Agriculture, forestry, fishing, and hunting	484,747					816	109	0					
Mining.....		561,972	11		710						192		
Utilities.....			360,880					736					
Construction.....	850	18,307	2,345	1,134,649	4,722	4,361	4,726	536	1,603	11,482	2,090	2,103	2,469
Manufacturing.....	10	31,849			5,691,358	8,308	18,608		1,035		2,537		
Wholesale trade.....		582			54,313	1,218,088		106	4,927	72	5,945		
Retail trade.....			29				1,184,907	42	1,571	1,622	6,633	11,883	7,346
Transportation and warehousing.....			590				1,319	4,005	977,283		558		
Information.....									1,159,274		29,226		282
Finance, insurance, real estate, rental, and leasing.....					84	10,533	10,888	590	3,936	5,020,382	911	6,236	13,162
Professional and business services.....	0	980	741	218	160,013	20,601	4,863	2,741	233,998	16,169	3,057,087	39,414	6,716
Educational services, health care, and social assistance.....						0	757	28	1,329	3	1,384	2,269,391	1,614
Arts, entertainment, recreation, accommodation, and food services.....	1,478							32,922	381	69	49	7	22,218
Other services, except government.....					84	57,096	85,502	207	1,817	1,702	1,226	12	2,184
Government.....			1,843										
Scrap, used and secondhand goods.....					4,969						1,406		122
Noncomparable imports and rest-of-the-world adjustment.....													
Total supply (basic prices)	487,085	613,690	366,439	1,134,867	5,916,253	1,321,122	1,347,288	982,650	1,409,559	5,052,038	3,108,643	2,351,257	1,073,076
Commodities/Industries	Industries					Valuation adjustment							Total commodity supply (purchasers' prices)
	Other services, except government	Government	Total commodity output (basic prices)	Imports	Total commodity supply (basic prices)	Trade margins	Transportation costs	Total trade margins and transportation costs	Import duties	Tax on products	Subsidies	Total tax less subsidies on products	
	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)		(26)
Agriculture, forestry, fishing, and hunting		4,105	489,777	51,211	540,989	96,688	48,560	145,249	37	4,311	9,301	-4,954	681,283
Mining.....		452	563,336	291,868	855,204	8,499	62,946	71,445	75	24,952		25,026	951,676
Utilities.....		114,930	476,545	2,650	479,195					20,163		20,163	499,358
Construction.....	390	16,287	1,206,919		1,206,919								1,206,919
Manufacturing.....		9,316	5,763,022	1,727,725	7,490,747	2,120,379	252,978	2,373,357	35,281	303,885	484	338,682	10,202,787
Wholesale trade.....		579	1,284,612		1,284,612	-1,193,290		-1,193,290		198		198	91,520
Retail trade.....	4,304	5,977	1,224,315		1,224,315	-1,218,764		-1,218,764		112	0	112	5,663
Transportation and warehousing.....		26,966	1,010,720	25,418	1,036,139	-402,200		-402,200		16,037	2,241	13,796	647,735
Information.....		281	1,192,284	10,045	1,202,330	92,428	5,830	98,258	1	37,413	395	37,019	1,337,607
Finance, insurance, real estate, rental, and leasing.....		642	5,122,719	49,968	5,172,687					30,082	19,103	10,979	5,183,666
Professional and business services.....		1,587	3,664,712	105,943	3,770,655					26,874		26,874	3,797,530
Educational services, health care, and social assistance.....		43	2,565,358	4,625	2,569,983					3,167	3,642	-475	2,569,508
Arts, entertainment, recreation, accommodation, and food services.....		4,596	1,166,727	914	1,167,640					51,817		51,817	1,219,458
Other services, except government.....		571,363	4,142	725,335	3,383	728,717				15,289		15,294	744,012
Government.....		2,729,278	2,731,121	421	2,731,542						24,997	-24,997	2,706,545
Scrap, used and secondhand goods.....		4,810	11,307	14,945	26,252	94,059	31,885	125,944	25	9,819		9,843	162,040
Noncomparable imports and rest-of-the-world adjustment.....		3,097	3,097	221,668	224,766								224,766
Total supply (basic prices)	583,785	3,454,156	29,201,908	2,510,785	31,712,693	0	0	0	35,424	544,117	60,163	519,378	32,232,072

section and a valuation adjustment section. The domestic supply section (columns 1–18) forms the main body of the supply table and can be divided into two subsections: domestic output and imports. In the domestic output subsection (columns 1–16), industries appear across columns and commodities across rows, and each cell indicates the amount of each commodity that is produced domestically by each industry; the statistics in this subsection are valued at basic prices (see the box “Concepts of Valuation”).

The import subsection (column 17) shows the commodity composition of imports. Imports are valued at the importers’ customs frontier price, also known as the c.i.f. valuation. This price includes the cost of the product at foreign port value plus insurance and freight charges to move the product to the domestic port. Just as domestic taxes on products are excluded from the domestic output, import duties are also excluded from the import subsection.

Total domestic supply by commodity valued at basic prices (column 18) presents the sum of the domestic output and imports. The valuation adjustment section (columns 19–24) bridges the difference between total domestic supply at basic prices (column 18) and domestic supply at purchasers’ prices (column 26). This section can also be divided into two subsections: the margin transformation subsection and the tax and

subsidy subsection. The purpose of the margin transformation subsection (columns 19–21) is to adjust the allocation of transportation costs and wholesale and retail trade margins so that the value of these margins do not appear as their own rows but are instead allocated to the goods that are transported or resold by wholesalers and retailers. Each column in this subsection sums to zero, which confirms that these columns rearrange existing output without adding to, or subtracting from, it. The tax and subsidy subsection (columns 22–25) adds import duties and taxes on products and removes subsidies, thereby completing the transformation from basic prices to purchasers’ prices.

The use table

Table 2 is a sector-level use table that is based on the supply-use framework. No distinction is made in this use table between imports and domestically produced output. This table comprises three sections: intermediate inputs, final demand, and value added. The intermediate inputs section (columns 1–16 and rows 1–18) forms the main body of the use table. Like the supply table, industries appear across columns and commodities across rows; however, in the use table, each cell indicates the amount of a commodity purchased by each industry as an intermediate input into the industry’s production process. These commodities are valued at purchasers’ prices, meaning that taxes, transportation costs, and wholesale and retail trade margins are embedded in the total along with the underlying value of the actual commodity purchased. Additionally, no distinction is made here or elsewhere in the use table between imports and domestically produced output.

The final demand section (columns 17–21) presents expenditure-side components of GDP, including personal consumption expenditures, private investment, exports of goods and services, and government consumption expenditures and gross investment. Commodities appear across rows and final demand categories (rather than industries) appear across the columns. Final demand statistics are also valued at purchasers’ prices.

Value added, or the income generated by production, appears in the value-added section (rows 19–26). This section can be divided into two subsections: value added at basic prices and value added at purchasers’ prices. The first subsection (rows 19–22) shows value added by industry at basic prices. The primary components of value added are also shown; these components are returns to labor (compensation of employees), returns to capital (gross operating surplus), and returns to government (other taxes on production).

Concepts of Valuation

Three central concepts of valuation connect the flows of goods and services: producers’ price, basic price, and purchasers’ price. These concepts differ in their treatment of taxes on products, subsidies, and trade and transport margins.

The *producers’ price* is the total amount received by the producer from the purchasers’ as a result of the sale of a unit of a good or service. It excludes transport charges separately invoiced by the producer.

The *basic price* is the total amount retained by the producer as a result of the sale. It is the price most relevant to the producers’ decisionmaking process. This valuation is equal to the producers’ price less taxes payable as a result of the sale or production of the good or service plus any subsidy receivable as a result of the sale or production of the good or service.

The *purchasers’ price* is the total amount paid by the purchasers’ in order to take delivery of a unit of a good or service. It is the price most relevant to the purchasers’ decisionmaking process. This valuation is equal to the producers’ price plus any wholesale, retail, or transportation markups charged by intermediaries between the producer and purchasers’.

The value added at purchasers' prices subsection (rows 24–26) can be thought of as an addendum to the value added in the preceding rows. Value added at basic prices (row 22) plus taxes on products and imports (row 24) less subsidies (row 25) yields value added at purchasers' prices (row 26), which is also referred to as

value added at market prices. This row is an important addition because the sum of value added at market prices across all industries is equal to GDP for the economy.

Column 22 in the use table shows the sum of both intermediate and final uses of each commodity valued

Table 2. The Use of Commodities (Supply-Use Framework), 2013

[Millions of dollars]

Row	Commodities/Industries	Industries										
		Agriculture, forestry, fishing, and hunting	Mining	Utilities	Construction	Manufacturing	Wholesale trade	Retail trade	Transportation and warehousing	Information	Finance, insurance, real estate, rental, and leasing	Professional and business services
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1	Agriculture, forestry, fishing, and hunting	109,806	202	0	2,468	330,045	1,857	4,127	107	2	64	2,611
2	Mining.....	3,374	64,598	42,546	15,971	608,263	57	60	2,159	379	5,352	1,740
3	Utilities.....	4,168	3,563	2,191	2,192	55,702	4,641	10,797	5,912	4,326	68,779	9,216
4	Construction.....	2,657	5,770	3,257	154	14,645	1,491	3,000	4,502	2,699	125,430	1,858
5	Manufacturing	99,801	57,011	27,524	403,670	2,240,358	50,563	68,739	224,675	121,258	67,872	177,184
6	Wholesale trade	2,275	332	1,319	12	26,819	33,422	17,668	115	1,674	6,169	48
7	Retail trade.....							2,721				
8	Transportation and warehousing.....	1,759	997	5,831	978	21,276	59,937	66,699	101,826	14,309	21,635	40,409
9	Information	455	974	1,027	4,180	24,210	15,982	19,633	5,121	236,095	53,790	70,212
10	Finance, insurance, real estate, rental, and leasing.....	19,250	17,337	8,346	30,172	83,235	97,777	151,892	69,952	69,692	815,346	230,589
11	Professional and business services.....	5,351	37,507	13,926	44,182	414,385	191,284	166,368	58,895	151,424	401,060	507,621
12	Educational services, health care, and social assistance.....	431	0	97	18	65	965	7,053	60	820	38	726
13	Arts, entertainment, recreation, accommodation, and food services.....	512	981	1,879	2,277	21,147	8,474	6,273	3,012	34,270	41,939	62,648
14	Other services, except government.....	1,041	732	525	4,804	16,656	17,681	12,132	4,803	10,725	29,521	31,065
15	Government	43	6	336	26	5,464	10,036	6,693	13,035	2,427	14,963	8,685
16	Scrap, used and secondhand goods.....	-37	190	215	881	30,709	1	25	3,965	3	-32	392
17	Noncomparable imports and rest-of-the-world adjustment.....	814	1,039	922	2,961	18,871	4,062	2,380	16,871	13,947	28,680	8,909
18	Total intermediate inputs (purchasers' prices).....	251,699	191,239	109,940	514,944	3,911,850	498,230	546,261	515,010	664,048	1,680,605	1,153,915
19	Compensation of employees.....	50,616	92,833	72,568	390,384	932,479	467,630	529,219	282,681	286,126	761,682	1,431,632
20	Other taxes on production.....	8,893	24,330	38,220	7,817	60,592	25,639	30,097	13,912	12,332	267,789	24,274
21	Gross operating surplus.....	175,878	305,288	145,711	221,722	1,011,332	329,623	241,711	171,046	447,053	2,341,963	498,822
22	Value added (basic prices).....	235,386	422,450	256,499	619,923	2,004,403	822,892	801,027	467,640	745,511	3,371,433	1,954,728
23	Total industry output (basic prices).....	487,085	613,690	366,439	1,134,867	5,916,253	1,321,122	1,347,288	982,650	1,409,559	5,052,038	3,108,643
24	Plus: Taxes on products and imports.....	550	16,948	20,163		24,562	175,604	170,330	16,040	34,069	29,407	26,985
25	Less: Subsidies.....	9,301				484		0	2,241	395	19,103	
26	Value added (purchasers' prices).....	226,635	439,398	276,662	619,923	2,028,481	998,496	971,357	481,439	779,185	3,381,737	1,981,713

Row	Commodities/Industries	Industries				Total intermediate use (purchasers' prices)	Final demand					Total use of commodities (purchasers' prices)
		Educational services, health care, and social assistance	Arts, entertainment, recreation, accommodation, and food services	Other services, except government	Government		Personal consumption expenditures	Private fixed investment	Change in private inventories	Exports of goods and services	Government consumption expenditures and gross investment	
		(12)	(13)	(14)	(15)		(17)	(18)	(19)	(20)	(21)	
1	Agriculture, forestry, fishing, and hunting	1,330	8,770	98	4,025	465,513	131,745		13,867	70,158		681,283
2	Mining.....	592	1,417	540	23,802	770,851	700	141,804	-640	38,961		951,676
3	Utilities.....	25,255	10,772	3,593	29,092	240,200	257,189			1,969		499,358
4	Construction.....	2,887	2,330	3,353	67,644	241,677		696,874		113	268,254	1,206,919
5	Manufacturing	226,950	176,683	65,717	438,836	4,446,840	3,412,159	983,582	54,080	1,173,631	132,495	10,202,787
6	Wholesale trade	522	85	34	24	90,517				1,002		91,520
7	Retail trade.....					2,721	2,941					5,663
8	Transportation and warehousing.....	18,112	8,635	3,638	49,547	415,586	156,331			75,818		647,735
9	Information	29,652	9,705	8,325	77,801	557,163	535,919	148,082	1,036	88,311	7,096	1,337,607
10	Finance, insurance, real estate, rental, and leasing.....	317,400	94,461	75,651	137,787	2,218,888	2,681,848	106,041		176,887		5,183,666
11	Professional and business services.....	248,020	137,186	38,875	268,699	2,684,780	222,391	568,421		140,055	181,883	3,797,529
12	Educational services, health care, and social assistance.....	24,929	1,936	2,213	32,838	72,190	2,492,622			4,697		2,569,508
13	Arts, entertainment, recreation, accommodation, and food services.....	31,806	27,913	3,565	34,370	281,067	929,202	4,287		4,902		1,219,458
14	Other services, except government.....	35,959	11,781	6,252	27,677	211,354	532,340			318		744,012
15	Government	7,037	6,374	1,672	9,392	86,188	72,393			372	2,547,591	2,706,545
16	Scrap, used and secondhand goods.....	635	171	10,377	-2	47,492	141,131	-81,807	5,718	42,917	6,589	162,040
17	Noncomparable imports and rest-of-the-world adjustment.....	867	3,022	344	16,518	120,205	-84,558	6,633		182,486		224,766
18	Total intermediate inputs (purchasers' prices).....	971,953	501,243	224,246	1,218,051	12,953,233	11,484,354	2,573,918	74,061	2,002,596	3,143,909	32,232,072
19	Compensation of employees.....	1,155,070	380,338	261,054	1,759,324	8,853,634						
20	Other taxes on production.....	31,037	28,449	9,523	0	582,903						
21	Gross operating surplus.....	193,197	163,046	88,962	476,780	6,812,137						
22	Value added (basic prices).....	1,379,304	571,833	359,539	2,236,105	16,248,674						
23	Total industry output (basic prices).....	2,351,257	1,073,076	583,785	3,454,156	29,201,908						
24	Plus: Taxes on products and imports.....	4,690	49,886	9,769	538	579,541						
25	Less: Subsidies.....	3,642			24,997	60,163						
26	Value added (purchasers' prices).....	1,380,352	621,719	369,308	2,211,646	16,768,053						

at purchasers' prices. The values in this column match the total supply values in column 26 of the supply table. This equivalency—domestic supply equal to domestic use—is an accounting identity that, by definition, must hold true. The supply table captures the total amount of each commodity produced domestically or imported, and the columns of the use table are designed to capture all possible uses of that supply.

Similarly, row 23 in the use table shows the value of intermediate inputs at purchasers' prices plus value added at basic prices. The values in this row match total output by industry presented in the supply table. This equivalency—gross output equal to intermediate purchases plus value added—is also an accounting identity that must, by definition, hold true. One way to understand this accounting identity is to view the value of domestic output by industry as the revenue that the industry generates from current-period production. Some of this revenue is used up in the purchase of the intermediate inputs required to produce the output. The remaining revenue represents the industry's value added—the difference between the value

of the industry's raw inputs and its finished products. A portion of this revenue is paid out as compensation to the industry's employees. Anything that remains goes to the business owners who use it to pay themselves, to pay taxes and fees owed to government, and to rent, buy, and maintain the capital necessary for the business to function.

Methodology

BEA's featured I-O accounts, the make and use tables, are an integral and essential element of the U.S. economic accounts (tables 3 and 4). They stand alone as an important source for detailed information on economic processes and relationships, they are the foundation on which all other statistics in the IEAs rely, and they are building blocks for BEA's other economic accounts, including the NIPAs.

The newly developed supply-use tables are not only similar to BEA's featured make-use framework, they are also fully consistent with that framework. The supply-use tables are not estimated or balanced independent of the make-use framework. Instead, the

Table 3. The Make of Commodities, 2013

[Millions of dollars]

Industries/Commodities	Industries								
	Agriculture, forestry, fishing, and hunting	Mining	Utilities	Construction	Manufacturing	Wholesale trade	Retail trade	Transportation and warehousing	Information
Agriculture, forestry, fishing, and hunting	475,995			850	10				
Mining.....		578,920		18,307	31,849	582			
Utilities.....		11	381,043	2,345			29	590	
Construction.....				1,134,649					
Manufacturing.....		710		4,722	5,715,437	54,313			
Wholesale trade.....	816			4,361	8,308	1,390,931		1,320	
Retail trade.....	109			4,726	18,608		1,348,636	4,007	
Transportation and warehousing.....	0		736	536		109	58	991,018	
Information.....				1,603	1,035	5,501	2,282		1,190,592
Finance, insurance, real estate, rental, and leasing.....				11,482		75	1,970	559	
Professional and business services.....		192		2,090	2,537	6,031	7,525		29,520
Educational services, health care, and social assistance.....				2,103			12,257		
Arts, entertainment, recreation, accommodation, and food services.....				2,469			9,065		282
Other services, except government.....				390		595	4,984		282
Government.....	4,105	452	114,930	16,287	9,316		6,028	27,023	3,221
Total commodity output (producer prices).....	481,026	580,284	496,708	1,206,919	5,787,100	1,458,137	1,392,835	1,024,517	1,223,897
Industries/Commodities	Industries							Total industry output (producer prices)	
	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	Other services, except government	Government	Scrap, used, and secondhand goods		Noncomparable imports and rest-of-the-world adjustment
Agriculture, forestry, fishing, and hunting		0		1,478					478,334
Mining.....		980							630,638
Utilities.....		741				1,843			386,602
Construction.....		218							1,134,867
Manufacturing.....	84	160,013			84		4,969		5,940,332
Wholesale trade.....	10,899	20,667	0		59,423				1,496,726
Retail trade.....	11,244	4,886	762	35,351	89,289				1,517,618
Transportation and warehousing.....	603	2,761	29	388	211				996,450
Information.....	4,062	234,896	1,332	74	1,855				1,443,233
Finance, insurance, real estate, rental, and leasing.....	5,030,057	16,336	3	71	1,790				5,062,342
Professional and business services.....	920	3,082,771	1,399	7	1,231		1,406		3,135,628
Educational services, health care, and social assistance.....	6,630	39,414	2,268,897	22,992	12				2,352,305
Arts, entertainment, recreation, accommodation, and food services.....	13,191	6,728	1,610	1,087,259	2,235		122		1,122,962
Other services, except government.....	650	1,591	43	4,850	580,169				593,554
Government.....	55,357	119,583	290,809	66,073	4,324	2,704,281	4,810	3,097	3,429,697
Total commodity output (producer prices).....	5,133,698	3,691,586	2,564,883	1,218,544	740,624	2,706,124	11,307	3,097	29,721,286

make-use framework serves as a starting point for the estimation process with adjustments, additions, and other transformations introduced to translate these tables into the supply-use framework.

Supply table. The first step in generating the supply table is to construct the domestic production matrix by transposing the make table (see table 3) and then by applying two adjustments to the make table values in order to adjust the valuation from producers' prices to

basic prices. First, taxes on products must be removed from the domestic production matrix, including state and local government general sales taxes and both federal and state and local government excise taxes on fuel, alcohol, tobacco, and utilities. Other taxes on production, such as state and local government property taxes and federal and state and local government licensing fees, are not removed. In the make-use framework, no distinction is made between taxes on

Table 4. The Use of Commodities (Make-Use Framework), 2013

[Millions of dollars]

Commodities/Industries	Industries											
	Agriculture, forestry, fishing, and hunting	Mining	Utilities	Construction	Manufacturing	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
Agriculture, forestry, fishing, and hunting.....	94,325	160	0	1,939	275,162	1,584	3,193	92	1	49	2,030	1,094
Mining.....	2,473	54,705	33,987	10,292	568,596	50	57	2,015	301	4,060	1,341	457
Utilities.....	4,168	3,563	2,191	2,192	55,702	4,641	10,797	5,912	4,326	68,779	9,216	25,255
Construction.....	2,657	5,770	3,257	154	14,645	1,491	3,000	4,502	2,699	125,430	1,858	2,887
Manufacturing.....	83,010	48,039	23,886	269,116	1,948,788	42,100	53,835	182,284	102,113	52,529	146,138	182,905
Wholesale trade.....	24,367	7,729	4,214	45,363	286,372	39,730	26,436	34,180	26,605	13,307	24,492	37,515
Retail trade.....	185	210	305	77,143	12,983	765	7,369	5,196	418	6,303	2,466	1,730
Transportation and warehousing.....	12,661	12,321	14,884	19,355	147,606	61,656	69,156	105,987	18,489	24,931	46,749	24,495
Information.....	453	973	1,025	4,177	24,178	15,933	19,604	5,111	225,790	53,703	69,226	28,993
Finance, insurance, real estate, rental, and leasing.....	19,250	17,337	8,346	30,172	83,235	97,777	151,892	69,952	69,692	815,346	230,589	317,400
Professional and business services.....	5,351	37,507	13,926	44,182	414,385	191,284	166,368	58,895	151,424	401,060	507,621	248,020
Educational services, health care, and social assistance.....	431	0	97	18	65	965	7,053	60	820	38	726	24,929
Arts, entertainment, recreation, accommodation, and food services.....	512	982	1,879	2,277	21,147	8,474	6,273	3,012	34,270	41,939	62,648	31,806
Other services, except government.....	1,041	732	525	4,804	16,656	17,681	12,132	4,803	10,725	29,521	31,065	35,959
Government.....	43	6	336	26	5,464	10,036	6,693	13,035	2,427	14,963	8,685	7,037
Scrap, used and secondhand goods.....	-40	164	160	774	17,996	0	21	3,102	1	-32	155	604
Noncomparable imports and rest-of-the-world adjustment.....	814	1,040	922	2,961	18,871	4,062	2,380	16,871	13,947	28,680	8,909	867
Total intermediate inputs (producer prices).....	251,699	191,239	109,940	514,944	3,911,850	498,230	546,261	515,010	664,048	1,680,605	1,153,915	971,953
Compensation of employees.....	50,616	92,833	72,568	390,384	932,479	467,630	529,219	282,681	286,126	761,682	1,431,632	1,155,070
Taxes on production and imports, less subsidies.....	141	41,278	58,383	7,817	84,670	201,243	200,427	27,712	46,006	278,093	51,259	32,085
Gross operating surplus.....	175,878	305,288	145,711	221,722	1,011,332	329,623	241,711	171,046	447,053	2,341,963	498,822	193,197
Total value added (producer prices).....	226,635	439,398	276,662	619,923	2,028,481	998,496	971,357	481,439	779,185	3,381,737	1,981,713	1,380,353
Total industry output (producer prices).....	478,334	630,638	386,602	1,134,867	5,940,332	1,496,726	1,517,618	996,450	1,443,233	5,062,342	3,135,628	2,352,305

Commodities/Industries	Industries			Total intermediate use (producer prices)	Personal consumption expenditures	Private fixed investment	Change in private inventories	Exports of goods and services	Imports of goods and services	Government consumption expenditures and gross investment	Total final uses (producer prices)	Total commodity output (producer value)
	Arts, entertainment, recreation, accommodation, and food services	Other services, except government	Government									
Agriculture, forestry, fishing, and hunting.....	7,517	81	2,663	389,891	74,556	.....	13,387	54,440	-51,248	.....	91,135	481,026
Mining.....	1,163	454	18,612	698,562	358	141,722	-308	31,893	-291,943	.....	-118,278	580,284
Utilities.....	10,772	3,593	29,092	240,200	257,189	.....	.....	1,969	-2,650	.....	256,509	496,708
Construction.....	2,330	3,353	67,644	241,677	.....	696,874	.....	113	.....	268,254	965,242	1,206,919
Manufacturing.....	142,084	50,845	383,791	3,711,464	1,877,472	784,169	46,542	1,011,760	-1,763,007	118,700	2,075,636	5,787,100
Wholesale trade.....	23,004	8,580	46,384	648,278	434,494	158,065	6,996	162,349	35,424	12,532	809,859	1,458,137
Retail trade.....	7,389	4,995	596	128,054	1,217,104	47,677	.....	.....	.....	.....	1,264,780	1,392,835
Transportation and warehousing.....	14,748	5,512	65,677	644,228	248,257	28,866	1,553	124,239	-25,418	2,793	380,289	1,024,517
Information.....	9,577	8,223	76,332	543,301	475,917	130,232	820	78,023	-10,047	5,652	680,596	1,223,897
Finance, insurance, real estate, rental, and leasing.....	94,461	75,651	137,787	2,218,888	2,681,848	106,041	.....	176,887	-49,968	.....	2,914,809	5,133,698
Professional and business services.....	137,186	38,875	268,699	2,684,780	222,391	568,421	.....	140,055	-105,943	181,883	1,006,806	3,691,586
Educational services, health care, and social assistance.....	1,936	2,213	32,838	72,190	2,492,622	.....	.....	4,697	-4,625	.....	2,492,694	2,564,883
Arts, entertainment, recreation, accommodation, and food services.....	27,913	3,565	34,370	281,067	929,202	4,287	.....	4,902	-914	.....	937,477	1,218,544
Other services, except government.....	11,781	6,252	27,677	211,354	532,340	.....	.....	318	-3,388	.....	529,269	740,624
Government.....	6,374	1,672	9,392	86,188	72,393	.....	.....	372	-421	2,547,591	2,619,935	2,706,124
Scrap, used and secondhand goods.....	-15	10,039	-22	32,906	52,769	-99,069	5,071	28,095	-14,969	6,503	-21,599	11,307
Noncomparable imports and rest-of-the-world adjustment.....	3,022	344	16,518	120,205	-84,558	6,633	.....	182,486	-221,668	.....	-117,108	3,097
Total intermediate inputs (producer prices).....	501,243	224,246	1,218,051	12,953,233	.....	.....	.....	.....	.....	.....	.....	.....
Compensation of employees.....	380,338	261,054	1,759,324	8,853,634	.....	.....	.....	.....	.....	.....	.....	.....
Taxes on production and imports, less subsidies.....	78,335	19,292	-24,459	1,102,282	.....	.....	.....	.....	.....	.....	.....	.....
Gross operating surplus.....	163,046	88,962	476,780	6,812,137	.....	.....	.....	.....	.....	.....	.....	.....
Total value added (producer prices).....	621,719	369,308	2,211,646	.....	.....	.....	.....	.....	.....	.....	16,768,053	.....
Total industry output (producer prices).....	1,122,962	593,554	3,429,697	.....	11,484,354	2,573,918	74,061	2,002,596	-2,510,785	3,143,909	.....	29,721,286

products and other taxes on production, and extensive research was required to identify and categorize the separate taxes into these two categories.⁷ Second, subsidies are added to the domestic production matrix. Subsidies, which are monetary grants paid by government agencies to private business and to government enterprises, are assumed to be associated with the primary output of each industry. Subsidies on products are included in the supply valued at basic prices because that valuation is intended to capture the total amount ultimately received by the producer in exchange for its product.⁸

The next step in generating the supply table is to add the import subsection by reversing the sign on the import column in the use table on the make-use framework (table 4) and shifting it to the supply table.⁹ Additionally, the valuation of imports must be compatible with that of the domestic production matrix. In the make-use framework, imports are valued at domestic port value, which is equivalent to the importer's customs frontier price, plus import duties.¹⁰ Import duties, which are comparable with taxes on products in the domestic production matrix, must also be removed to arrive at domestic supply valued at basic prices. Estimates for these duties are calculated at a detailed, commodity level, according to the *Harmonized Tariff Schedule for the United States*.

Combining the domestic production matrix with the supply of total imports (both of which are adjusted to a basic price valuation) yields the total supply of products at basic prices. The total supply at basic prices is transformed into the total supply at purchasers' prices by applying the valuation adjustments in the supply table. First, the trade and transportation adjustment vectors are applied, which adds transportation costs and wholesale and retail trade margins to the

products on which these charges are levied. Information on the distribution of these charges is estimated as part of the standard make-use framework. These values are aggregated by commodity with offsets in the transportation, wholesale trade, and retail trade commodity rows in order to form the margin adjustment vectors. Next, the transformation from basic prices to purchasers' prices is completed by adding back the taxes on products and customs duties that were removed from the domestic production matrix and import column and by removing the subsidies that were added to the domestic production matrix.

Use table. The structure of the proposed use table (on a supply-use framework) is nearly identical to the featured use table (on a make-use framework); both show the use of commodities by industries and by final users as well as the value added by industry. Though the structure of the two use tables is similar, there are several noteworthy differences. Imports are not included in the use table on a supply-use framework, but they are included in the use table on a make-use framework. Additionally, the statistics in the proposed use table are valued at purchasers' prices, while BEA's featured time series of use tables are valued at producers' prices. Valuation in purchasers' prices shows inputs to industries and final uses at values that reflect the actual cost to the user of the good or service, including the costs of transporting the good to the user as well as any wholesale and trade markups incurred while bringing the product to market.

Another noteworthy difference is that the value-added section of the proposed use table includes a presentation of value added at basic prices, which are calculated as the difference between total output at basic prices and intermediate consumption at purchasers' prices. Value added at basic prices includes three components: compensation of employees, other taxes on production, and gross operating surplus. Compensation of employees and gross operating surplus are identical to the treatment in the featured use table. Other taxes on production consists mainly of taxes on the ownership or use of land, buildings, or other assets (for example, property taxes and business licenses) or on the labor employed (for example, payroll taxes) in production. Taxes on products and imports and the exclusion of subsidies are not included in the calculation of value added at basic prices.

Finally, additional detail is provided to show value added at purchasers' prices. Displaying value added at purchasers' prices is achieved by starting with value added at basic prices and then including the value of taxes on products and imports and excluding the value of subsidies. This feature is included to illustrate that value added by industries is equal to GDP.

7. Estimates of federal taxes are based on data from the Internal Revenue Service, from the Alcohol and Tobacco Tax and Trade Bureau and receipts from the *Monthly Treasury Statement*. Estimates of state and local taxes are based on data from the Census Bureau's annual survey of state and local government finances. For additional details on how taxes are allocated to industries and products, see "Net Exports of Goods and Services" in *Concepts and Methods of the U.S. National Income and Product Accounts*.

8. In theory, only subsidies on products should be added to the table, and other subsidies on production should be excluded. Work to distinguish these two categories of subsidies is an area for future research.

9. The frame of reference in the make-use framework is domestic output. In that framework, imports appear in the use table as an offsetting adjustment to the value of imports embedded in the intermediate inputs and final use sections. The frame of reference in the supply-use framework is domestic supply, so rather than remove imports from the use table, imports are added to output to arrive at domestic supply.

10. The customs frontier price is also referred to as the c.i.f. price, and it includes the cost of the underlying product valued at the foreign port price plus insurance and freight charges incurred to move the product between the frontier of exporter and that of the importer. The c.i.f. price does not include duties on imports that become payable when goods enter the economic territory by crossing the frontier or when services are delivered to resident units by nonresident units.

Next Steps

With the release of supply-use tables for the United States, BEA has taken an important step toward better harmonization of the IEAs with international guidelines. BEA plans to continue developing additional I-O products, including the following:

- The development and publication of supply-use tables, as defined by the International Standard Industrial Classification System (ISIC). This will lead to the introduction of industry statistics that are more useful for cross-country comparisons. The ISIC is the international standard for industry classification used by a number of International Institutions, including the OECD and the International Monetary Fund.
- The development and publication of extended supply-use tables based on criteria outlined by the OECD and Asia-Pacific Economic Cooperation working groups. These extended tables will reflect firm-level heterogeneity, such as domestic and foreign-ownership, and multinational/nonmultinational enterprise characteristics.¹¹ This project is an ongoing collaboration to better integrate BEA's international and industry data sets to provide better measures of economic globalization. The work to develop these tables will be based, in part, on future research conducted at the Census Bureau's Center for Economic Studies.

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11. See Fetzer and Strassner (2015).