

Economic Impact Analysis of the Hospital Industry in Arizona

Final Report

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Executive Summary

Hospitals play a significant role in the Arizona economy, and their economic impact reaches far beyond their walls. In addition to providing health care to local communities, the hospital industry creates jobs, purchases goods and services, and supports state and community public programs through the tax revenues that they generate. As this industry faces policy changes and fiscal challenges, policymakers, legislators and thought leaders in medicine should consider the economic impact of policy changes in addition to the impact on care.

This report estimates the total revenues (i.e., output), employment, employee compensation, and local and state tax revenue generated by the Arizona hospital industry.¹ The report is based on data reported in 2009 (the most recent year available). Dollar denominated values are inflated to 2010 levels to allow comparisons with current economic indicators. Impacts are presented at the county and state levels.

An economic impact analysis includes both a direct component and an indirect component. *Direct* impacts are the value of output, jobs, wages and benefits, and taxes that are produced from patient care activities provided in hospitals. *Indirect* impacts include the output, jobs, wages and benefits, and taxes generated in the industries that are supported by hospitals. “Total” impacts are the sum of the direct and indirect impacts.

Key findings are:

- The 102 hospitals in Arizona generated \$13.8 billion in direct output in 2009, 5.2% of the State’s gross domestic product (GDP) for that year. Including hospitals’ support of other state industries, the total economic impact of the hospital industry was \$27.8 billion, or 10.5% of Arizona’s GDP.
- The hospital industry directly employed nearly 80,000 FTE personnel across the State, 2.8% of total state employment, and supported over 93,600 FTE jobs, including those employed in other industries but whose jobs depend on economic activity created by hospitals.
- Including both wages and benefits, hospital personnel received over \$6 billion in direct employee compensation. The total employee compensation supported by the hospital industry in the State was nearly \$10 billion.
- Total state and local tax revenues supported by the hospital industry reached \$1.2 billion.

County-level analyses were performed in the same manner as the State analysis for 14 of the 15 counties in Arizona.² (Greenlee County was excluded because there is not a hospital in its boundaries.) Maricopa County contains 55 of the 102 hospitals in the State and accounts for 67% of the State’s direct output (\$9.2 billion); this is significantly larger than the median county’s direct output of \$166 million. The *total* supported output in a county ranged from \$25 million to nearly \$18 billion.

¹ Hospitals in the Arizona Hospital and Healthcare Association include general hospitals, as well as specialty, rehabilitation and behavioral health hospitals.

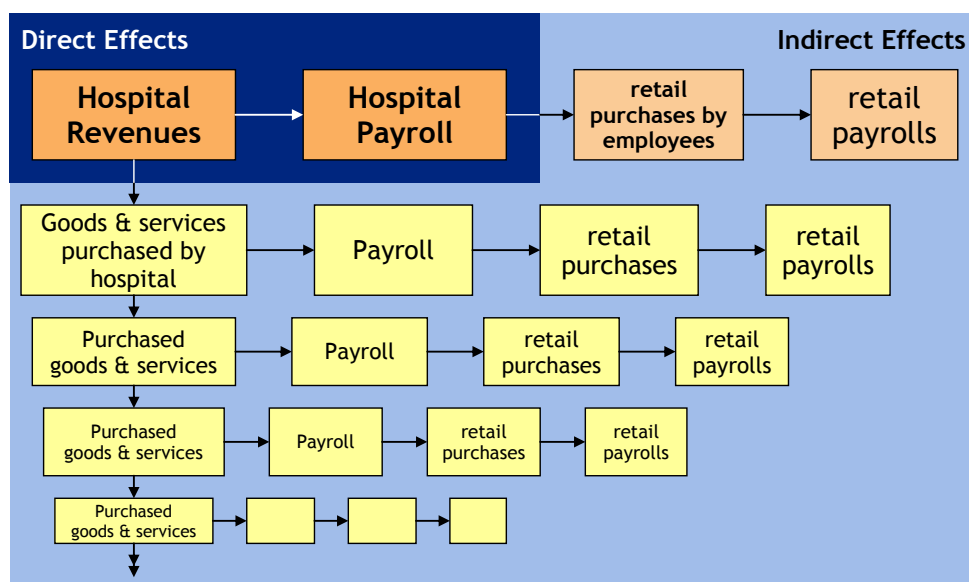
² Counties were analyzed as independent models with separate economic impact analyses, i.e., their “total effects” are limited to economic activity that occurs within their borders.

Economic Impact Analyses

Economic impact analyses (EIAs) track the reach of revenues generated by a business or economic activity as they flow through the local economy; tracking jobs created, spending that supports local business, and new tax revenues. EIAs include both direct and indirect benefits. **Direct** benefits, in the context of the hospital industry take the form of: 1) revenues generated in the course of the practice of medicine (i.e., the value of output); 2) the wages and benefits that go to administrators, providers and all other employees; 3) the number of jobs created in the hospital; and 4) the taxes that are paid by hospitals and their owners and employees.

Economic activities and businesses that are *supported* by hospitals outside of the hospital industry represent **indirect** benefits. These *business-to-business* effects include the supplies and equipment purchased by the hospital, administrative services, cleaning and property maintenance services, and clinical and laboratory services that support hospital operations. Additional indirect benefits (sometimes called induced effects)³ arise when hospital employees and employees of vendors spend their earnings to support local businesses, which, in turn, pay their employees and pay taxes, etc. Figure 1 illustrates the flow of indirect effects through an economy. With each cycle of spending there is some “leakage”, i.e., some spending goes outside the community and, as a result, generates no additional local value.

Figure 1: Economic Multipliers’ Flow



Direct and indirect effects are used to calculate an industry’s “multiplier.” This figure captures the total impact of an industry relative to its direct impact; the total impact in a community is a *multiple* of the economic benefit that is generated directly from hospital activity. In the current context, the multiplier reflects the number of times that each dollar generated by hospital-related services circulates through the local economy.

³ Induced effects are included as a portion of “indirect” effects in this report for ease of reading.

There are different economic multipliers, respectively, for output, wages and benefits, and jobs. An output multiplier is used to compute the total (i.e., direct and indirect) value of output created by an industry. The output multiplier captures the total economic output supported in an economy for every dollar in direct output. Employment multipliers compute the total number of full-time equivalent (FTE) jobs supported for every \$1 million of an industry's direct output. The multiplier for labor compensation (i.e., wages and benefits) is based on direct wages and benefits. For every dollar in direct employee compensation the multiplier indicates the total value of supported wages and benefits.

Multipliers are specific to geographic areas and to particular industries, and their values can vary widely. A multiplier of 1.0 would indicate that the total economic value of an industry is the same as the direct economic value, i.e., a dollar of revenue in the industry immediately leaves the community so that there is no cycling through the community for additional economic benefit. A multiplier will take on a value *greater* than 1.0 when a dollar earned by a business, e.g., a hospital, is spent within the specified geography, supporting jobs and other local businesses, which in turn pay their employees, who in turn buy more goods and services.

Multipliers are lower when business revenues are spent (leak) outside the specified geography or are spent on goods or services that support fewer local jobs. Multipliers for small community areas will be smaller than for larger areas because establishments in smaller areas often must look outside of their immediate communities to find inputs. Likewise, a county's multiplier would be smaller than a state's multiplier. It is often said that "health care is local". Indeed, health care multipliers tend to be higher than those for many other industries precisely because hospital and other health care personnel tend to live in the community and their services support the local community.

Methodology

Two datasets were used to compute the economic impact of the hospital industry in this report: hospital statistics were from the Uniform Accounting Reports filed with the Arizona Department of Health Services (AzDHS) and multiplier data were obtained from IMPLAN. Data from the AzDHS are for all member facilities, including general, specialty, rehabilitation, and behavioral hospitals. The data received for each hospital included hospital-level revenues, FTEs, and wages and benefits. Data were aggregated to the county and state levels. Because the data were from CY 2009, financial data were inflated to 2010 dollars.⁴

Economic impact data were taken from IMPLAN, an input-output modeling system developed by the Minnesota Implan Group. The software package estimates output, labor compensation (wages and benefits), and employment multipliers for each industry by selected geographic area using a social accounting system. IMPLAN multipliers can be customized by state, by county or by groups of counties, e.g., into metropolitan statistical areas. Models built for this report are based on data from 2008 but models are run in 2010 dollars.

The IMPLAN multipliers were applied to the adjusted data from AzHHA to calculate the indirect economic impacts, which were then summed with direct impacts.⁵

IMPLAN also provides data on state and local tax revenues generated by businesses and their employees by geographic area.⁶ Tax models are specific to the industry that is being studied.

⁴ All financial data in this report are in 2010 dollars. Data were adjusted by 2.029% per the Bureau of Labor Statistics' Hospital Price Index

⁵ Because we have direct impacts from the AzHHA, only the indirect effects were calculated with the IMPLAN multipliers. These figures were summed with the direct data to find the total impacts.

⁶ A scenario was run for each geographic area with a change in the hospital industry of \$1 million in output. Because tax impacts in each model have a linear relationship with industry output, this factor was then multiplied by the value of direct output in a geographic area (divided by one million) to calculate total state and local tax revenues.

Output

The 102 hospitals in the State of Arizona generated direct output of \$13.8 billion in 2009, as shown in Figure 2. This amount is 5.2% of the State's total GDP.⁷ With 55 of the 102 hospitals, Maricopa County generated \$9.2 billion in direct output (67%). Pima County, with 15 hospitals, generated \$2.2 billion in direct output (16%).

The county-level output multipliers for hospitals ranged from 1.01 in Pinal County to 1.94 in Maricopa County. For Maricopa County, an additional \$0.94 of output was supported in the county economy for every \$1 of hospital output. Higher output multipliers indicate that a greater number of inputs were purchased from the county community and that hospital employees were spending a greater amount of their income within county lines. Smaller output multipliers indicate that economic inputs were likely purchased outside of county lines and that fewer employee dollars were spent in the local economy as well. Small multipliers are typical in rural and frontier regions. The State output multiplier was 2.01. State multipliers are logically larger, as there is less "leakage" of economic activity out of larger geographic areas.

The *total* output supported by the hospital industry in the State of Arizona was \$27.8 billion. This amount is 10.5% of the State's total GDP. In Arizona's two largest counties, Maricopa and Pima, total supported economic output was \$17.8 and \$3.2 billion, respectively.⁸ Appendix A identifies the major industries that were supported by the hospital industry and the dollar value of support.

⁷ Arizona's gross domestic product in 2009 was \$256,364,000,000 (2009 dollars). Source: Bureau of Economic Analysis, U.S. Department of Commerce. The percentage was calculated hospital output in 2009 dollars also.

⁸ Note that the county-level total output figures are for total impact *within a county*. For state-wide effect from a county's hospital industry, the state-level multiplier should be used. For example, Apache County's hospital industry supports a total of \$102.7 million in the state. This concept also applies for employment and employee compensation.

Figure 2: Direct and Total Output from the Arizona Hospital Industry, 2009⁹

	Number of Hospitals	Direct Output (\$ in millions)	Output Multiplier	Total Output (\$ in millions)
State of Arizona	102	\$13,827.3	2.01	\$27,776.3
Counties				
Apache	2	\$51.7	1.26	\$65.3
Cochise	5	\$167.2	1.27	\$212.5
Coconino	3	\$378.6	1.30	\$491.7
Gila	2	\$96.5	1.32	\$127.4
Graham	1	\$57.3	1.22	\$70.1
Greenlee	0	-	-	-
La Paz	1	\$20.6	1.21	\$24.9
Maricopa	55	\$9,207.1	1.94	\$17,838.0
Mohave	6	\$554.5	1.54	\$856.6
Navajo	2	\$148.8	1.36	\$202.3
Pima	15	\$2,207.1	1.44	\$3,181.4
Pinal	2	\$165.9	1.01	\$167.5
Santa Cruz	1	\$23.2	1.22	\$28.3
Yavapai	5	\$404.9	1.29	\$521.9
Yuma	2	\$343.8	1.23	\$421.6

⁹ Values inflated to 2010 dollars.

Employment

Hospitals in Arizona directly employed nearly 80,000 FTE personnel in 2009, including administrators, physicians, nurses, and administrative and support staff (See Figure 3). Hospitals are a growth industry: this figure is 46% greater than direct employment in 2005, despite the economic climate in recent years.¹⁰ As to be expected given the number of hospitals in each county, Maricopa and Pima had the highest levels of direct hospital employment (respectively, 65% and 18% of the hospital employees in the state).

Employment multipliers show how many FTEs are supported by the hospital industry for every \$1 million in direct output. Similar to the output multipliers, the employment multipliers range from 1.01 (Pinal County) to 1.94 (Maricopa County). In Maricopa County, then, approximately one FTE was supported outside of the hospital industry for every \$1 million in hospital output. At the State level the value of the employment multiplier was 2.00.

Including indirect effects, Arizona's hospital industry supported a total of over 93,600 employees in the State. This was 3.3% of all employment in the State in 2009, as shown in Figure 3. Mohave County, with 6 hospitals, has the highest proportion of hospital-supported jobs of all counties, with 3.7%. Graham, Maricopa and Pima Counties all have at least 3% of employment supported by the hospital industry. (For direct employment as a percentage of county employment, see Figure 5.)

¹⁰ Comparison data compiled from Hospital Uniform Accounting Reports by the AzHHA.

Figure 3: Direct and Total Employment Impacts from the Arizona Hospital Industry, 2009¹¹

	Number of Hospitals	Direct Employment	Employment Multiplier	Total Employment	% of Employment Supported by Hospitals
State of Arizona	102	79,899	2.00	93,673	3.3%
Counties					
Apache	2	361	1.16	369	1.9%
Cochise	5	1,223	1.25	1,265	2.2%
Coconino	3	1,833	1.33	1,957	2.8%
Gila	2	466	1.34	499	2.4%
Graham	1	439	1.25	453	3.5%
Greenlee	0	-	-	-	-
La Paz	1	141	1.23	145	2.1%
Maricopa	55	51,827	1.94	60,478	3.3%
Mohave	6	2,732	1.58	3,051	3.7%
Navajo	2	765	1.34	815	2.3%
Pima	15	14,437	1.44	15,399	3.4%
Pinal	2	944	1.01	945	0.9%
Santa Cruz	1	222	1.24	228	1.4%
Yavapai	5	2,578	1.31	2,705	3.0%
Yuma	2	1,932	1.25	2,018	3.0%

¹¹ Jobs reported as FTEs. Employment multiplier is based on jobs created per \$1 million output. Total employment is calculated by multiplying direct output (in millions) by the employment multiplier minus one, and adding in the direct employment. The table's final column calculated by dividing "total" hospital-supported employment by area's employment across all industries. Total State employment (2.9 million) and county-level employment (across all industries) were averaged from monthly 2009 data taken from the Arizona Workforce Informer website, Arizona Department of Commerce Research Administration. URL: <http://www.workforce.az.gov/admin/uploadedPublications/CountyNAICS.pdf>

Wages and Benefits

Arizona hospitals paid their staff \$6.2 billion in wages and benefits in 2009 (inflated to 2010 dollars), as shown in Figure 4. Across all jobs within a hospital and across all geographic areas within the state, that is an average of over \$77,000 in wages and benefits per hospital employee, as shown in Figure 4. The average earnings of a hospital employee in Arizona *excluding* benefits amount to approximately \$64,600; county-level data are shown in Figure 5. Comparing this earnings information to all-industry wage data shown that – across almost all counties – hospital workers regularly earn higher wages than their counterparts in other industries.¹²

As is typical in EIAs, labor income (i.e., wages and benefit) multipliers are lower than output or employment multipliers. In the median Arizona county, for example, the labor income multiplier was 1.17. The highest labor income multiplier was 1.56, for Maricopa County. This means that for every \$1 spent by hospitals on employee compensation in Maricopa County, an additional \$0.56 in employee compensation was supported in other industries in the county. The State's labor income multiplier was 1.61.

Across the State, \$9.9 billion in total wages and benefits were supported by the hospital industry. Within Maricopa County, \$6.5 billion in wages and benefits was supported by the industry.

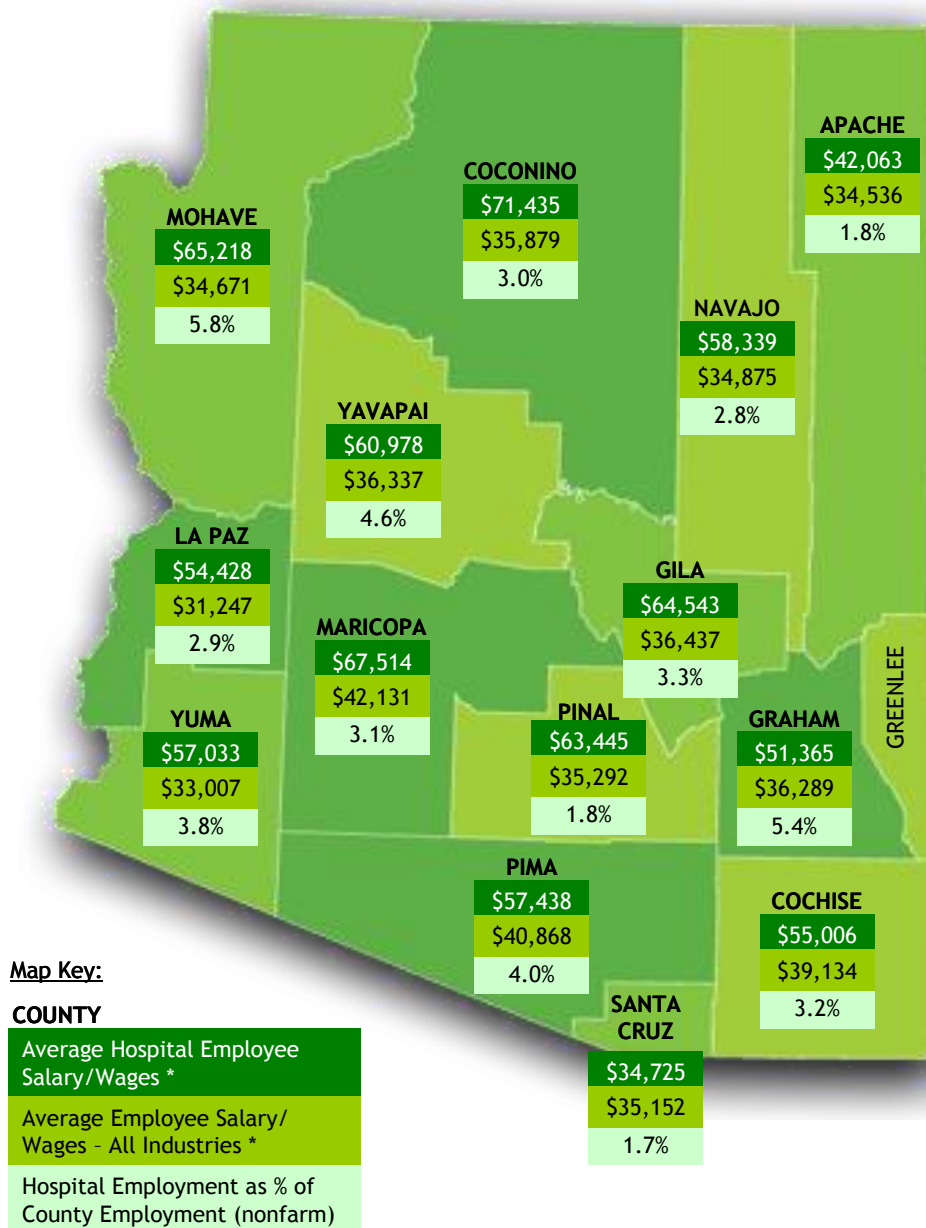
¹² As shown in Figure 5, Santa Cruz County is the only county comparison indicating slightly lower pay for hospital employees versus all industries. There is only one rural hospital in the area and a small population in the County, so the comparison may not be accurate

Figure 4: Direct and Total Wages & Benefits Supported by the Arizona Hospital Industry, 2009¹³

	Number of Hospitals	Direct Wages & Benefits (\$ in millions)	Average Direct Wages & Benefits per Employee	Labor Income Multiplier	Total Wages & Benefits (\$ in millions)
State of Arizona	102	\$6,158.4	\$77,077	1.61	\$9,902.4
Counties					
Apache	2	\$17.8	\$49,446	1.13	\$20.1
Cochise	5	\$81.0	\$66,243	1.18	\$95.6
Coconino	3	\$159.4	\$86,920	1.17	\$186.0
Gila	2	\$36.0	\$77,204	1.20	\$43.1
Graham	1	\$28.7	\$65,427	1.14	\$32.6
Greenlee	0	-	-	-	-
La Paz	1	\$9.4	\$66,984	1.10	\$10.3
Maricopa	55	\$4,155.0	\$80,169	1.56	\$6,466.2
Mohave	6	\$218.9	\$80,093	1.33	\$290.8
Navajo	2	\$58.2	\$76,042	1.22	\$71.1
Pima	15	\$981.3	\$67,971	1.28	\$1,254.6
Pinal	2	\$69.7	\$73,833	1.00	\$70.0
Santa Cruz	1	\$9.2	\$41,427	1.12	\$10.3
Yavapai	5	\$196.1	\$76,079	1.17	\$229.7
Yuma	2	\$137.8	\$71,359	1.14	\$157.0

¹³ Values inflated to 2010 dollars.

Figure 5: County Wages & Salaries Comparison, 2009 ¹⁴



* Benefits are excluded from salary/wages in Figure 5.

¹⁴ Average salary/wage data for hospital employees are from UARs; benefits are excluded, as opposed to data presented in Figure 4. All-industry annual mean salary/wage information is from BLS Occupational Employment Statistics Survey (2009), as processed by the Arizona Workforce Informer (www.workforce.az.gov). This data is per worker, not necessarily per FTE, which may understate earnings. Additionally, this data is calculated by where an employee lives, as opposed to UAR data which is based on where an employee works. Hospital employment as a percentage of all county employment is based on UAR *direct* hospital employment data (as opposed to total employment in Figure 3) and all-industry data is from the Arizona Workforce Informer, prepared in cooperation with the U.S. Department of Labor, Bureau of Labor Statistics, by State of Arizona, Department of Commerce, Research Administration.

Tax Revenue

Tax revenues reported in this analysis include those paid by the hospital industry and its employees (direct) and taxes generated through the economic activity supported in other industries (indirect). The sum of the direct and indirect tax impacts are the “total” tax revenues supported by the industry. Specifically, the state and local taxes in the analysis include:

- Social Security taxes: the state portions of Social Security taxes, both the employee and employer paid portions;
- Personal taxes: state and local income taxes, gift and estate taxes, motor vehicle taxes/fees, fishing/hunting and other license fees, property taxes, personal property taxes, and other fines/fees or donations;
- Business taxes: corporate profits and dividends taxes; and
- Indirect business taxes: property taxes, sales taxes, motor vehicle licensing, severance taxes, non-tax payments (e.g. rents and royalties, special assessments, fines, settlements and donations), and other taxes (including business licensing, documentary and stamp taxes).¹⁵

Across the State, \$1.19 billion in state and local tax revenues were generated by the hospital industry, as shown in Figure 6.

¹⁵ Olsen DC. Using Social Accounts to Estimate Tax Impacts. MIG, Inc. Available through IMPLAN.com. (Paper originally given at the Mid-Continent Regional Science Association Meetings in Minneapolis, MN; June 11, 1999.)

Figure 6: State/Local Tax Revenues Supported by the Arizona Hospital Industry, 2009¹⁶

	Number of Hospitals	Total State/Local Tax Revenue (\$ in millions)
State of Arizona	102	\$1,194.8
Counties		
Apache	2	\$2.0
Cochise	5	\$5.7
Coconino	3	\$15.9
Gila	2	\$3.8
Graham	1	\$2.0
Greenlee	0	-
La Paz	1	\$0.8
Maricopa	55	\$758.8
Mohave	6	\$29.9
Navajo	2	\$5.8
Pima	15	\$109.1
Pinal	2	\$3.5
Santa Cruz	1	\$0.8
Yavapai	5	\$16.0
Yuma	2	\$11.4

¹⁶ Values are in 2010 dollars.

Appendix A

Figure A-1: Arizona Industries with Over \$150 Million in Output Supported by the Hospital Industry, 2009¹⁷

Industry	Output Supported by the Hospital Industry (\$ in millions)
Real estate	\$2,210.3
Imputed rental activity for owner-occupied dwellings	\$935.5
Wholesale trade businesses	\$697.5
Food services and drinking places	\$521.9
Medical and diagnostic labs and outpatient and other ambulatory care services	\$484.3
Offices of physicians, dentists, and other health practitioners	\$460.5
Insurance carriers	\$437.8
Telecommunications	\$385.3
Management of companies and enterprises	\$344.7
Electric power generation, transmission, and distribution	\$323.0
Employment services	\$321.9
Monetary authorities and depository credit intermediation activities	\$284.7
Securities, commodity contracts, investments, and related activities	\$256.2
Nondepository credit intermediation and related activities	\$230.4
Legal services	\$208.1
Management, scientific, and technical consulting services	\$201.8
Retail Stores - Food and beverage	\$164.3
Other state and local government enterprises	\$162.5
Services to buildings and dwellings	\$157.1
Insurance agencies, brokerages, and related activities	\$154.8

¹⁷ Values are in 2010 dollars.