The Impact of Small Businesses on Texas Counties:

An Analysis of the Economic Impact of Texas Small Businesses within the Context of Industry Clusters

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Introduction

The Small Business Administration (SBA) reports that small businesses with less than 500 workers represent 99.7 percent of all employer firms and employ just over half of all private sector employees in the U.S. These firms also create more than half of the non-farm private gross domestic product (GDP).[2] In this context, the present impact study intends to depict a better picture of the contributions of small firms in Texas. It will also show the contributions of small firms to the six industrial clusters in the state and in 24 Council of Governments' areas.

In trying to better understand small firms' contributions, the study used a Governor's office definition of small businesses that focuses the attention on even smaller firms, those with less than 100 employees who are usually associated with the entrepreneurship spirit of the American economy Using this definition for the state of Texas, the data shows that small—employer—firms with less than 100 employees hired close to 2.9 million workers in 2006 (Table 1). These small firms numbered 377,374 and represented close to 96.4 percent of the 391,527 private firms for that year and their 2.9 million jobs accounted for 32.9 percent of the 8.7 million private, non-farm employment in the state. [3]

Table 1 also displays the number of non-employer firms in the state: more than 1.7 million in 2006. The Census Bureau through the Statistics of U.S. Businesses (SUSB) provides information on the number of these firms and on their receipts. According to the Census, at the national level, "Nonemployers account for roughly 3 percent of business activity [in terms of sales or receipts]. At the same time nonemployers account for nearly three-quarters of all businesses. Most nonemployer businesses are very small, and many are not the primary source of income for their owners."[4] For the state of Texas, non-employer firms represented close to 3.7 percent of business (production) activity and close to 81 percent of all private firms.

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[2] Taken from the Small Business Administration web site http://www.sba.gov/advo/research/data.html on January 25, 2010.

[3] The Census Bureau through the Statistics of U.S. Businesses (SUSB) provides national, state and metropolitan data on enterprises by size and industry. An enterprise is a business with one or more establishments under common ownership or control. For the present study, "a firm is defined as part of an enterprise tabulated in a particular industry, state or metropolitan area." Taken from www.census.gov/econ/susb/introduction.html; on January 25, 2010.

[4] Taken from the Small Business Administration web site http://www.sba.gov/advo/research/data.html on January 25, 2010

Table 1

Texas Small Firms Facts * (2006)	
Numbers of firms and establishments	
Number of employer firms with less than 100 employees	377,374
Number of employer firms with less than 500 employees **	386,422
Total number of employer firms ***	391,527
Total number of non-employer firms **	1,736,997
Total number of establishments ***	509,080
Employment	
Employment by firms with less than 100 employees (Thousands)	2,863.5
Employment by firms with less than 500 employees (Thousands) **	4,074.7
Total employment ***	8,711.5

* Nonfarm, private businesses

** Small Business Administration, Office of Advocacy, Texas Small Business Profile, October 2009

*** U.S. Census Bureau, Statistic of U.S. Businesses. Establishments can be part of a multi-establishment firm.

Economic impact studies show the effects that changes in production or employment from an industry (the direct effects) have on suppliers of that industry (the indirect effects) and on the rest of the regional economy through changes in spending by households due to jobs supported by the direct and indirect changes (the induced effects). In quantifying these changes, the studies can show the importance of the industry to the region.

Using 2006 as the base year, the estimated total economic impact of small—employer—firms with less than 100 workers, measured in terms of output (production), was $771.0 billion. Their total employment impact was estimated at 5.5 million jobs and their total value added (or gross state product) impact was calculated at $406.2 billion. This last impact represented 42.5 percent of the state's private-sector gross state product (GSP).[5]

When adding the impacts of non-employers, the combined total economic impact of SBL100, in terms of output (production), was close to $915.7 billion, the combined total employment impact was estimated at 6.7 million jobs, and the combined total value added (or gross state product) impact was calculated at $486.7 billion. This last impact represented 50.9 percent of the state's private-sector GSP. These small firms also produced a combined $17.3 billion in state revenues and a combined $20.9 billion in local governments' revenues.

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[5] Appendix A presents gross state product estimates by the Bureau of Economic Analysis and by the IMPLAN group.

For the study, direct employment, direct output and direct value added (or gross state product) effects for the government sector were not included [6] to better understand private firms' impacts.

Chart 1 displays the distribution of jobs, those labeled as direct employment in impact studies, across different sectors. Within this distribution, health and social services (12.5 percent) appears first in the list followed by accommodation and food services (12.2 percent), construction (10.6 percent), and retail trade (10.3 percent). At the other end, agriculture, forestry, fishing and hunting appears at the bottom (0.2 percent) preceded by management of companies (0.2 percent), and utilities (0.3 percent).

For presentation purposes, tables and charts show 20 economic sectors under a two-digit NAICS code classification. For the analyses of the economic impacts, three- and four- digit NAICS codes were used with the software IMPLAN and the SUSB data.[7] Furthermore, given the restrictions imposed by missing data from the SUSB and the County Business Patterns (CBP) information due to non-disclosure practices, the study used a methodology to fill in the missing data. This methodology required up to five- and six-digit NAICS codes for the CBP information that later was used to fill in the SUSB 2006 employment data by the size of the firms.[8]

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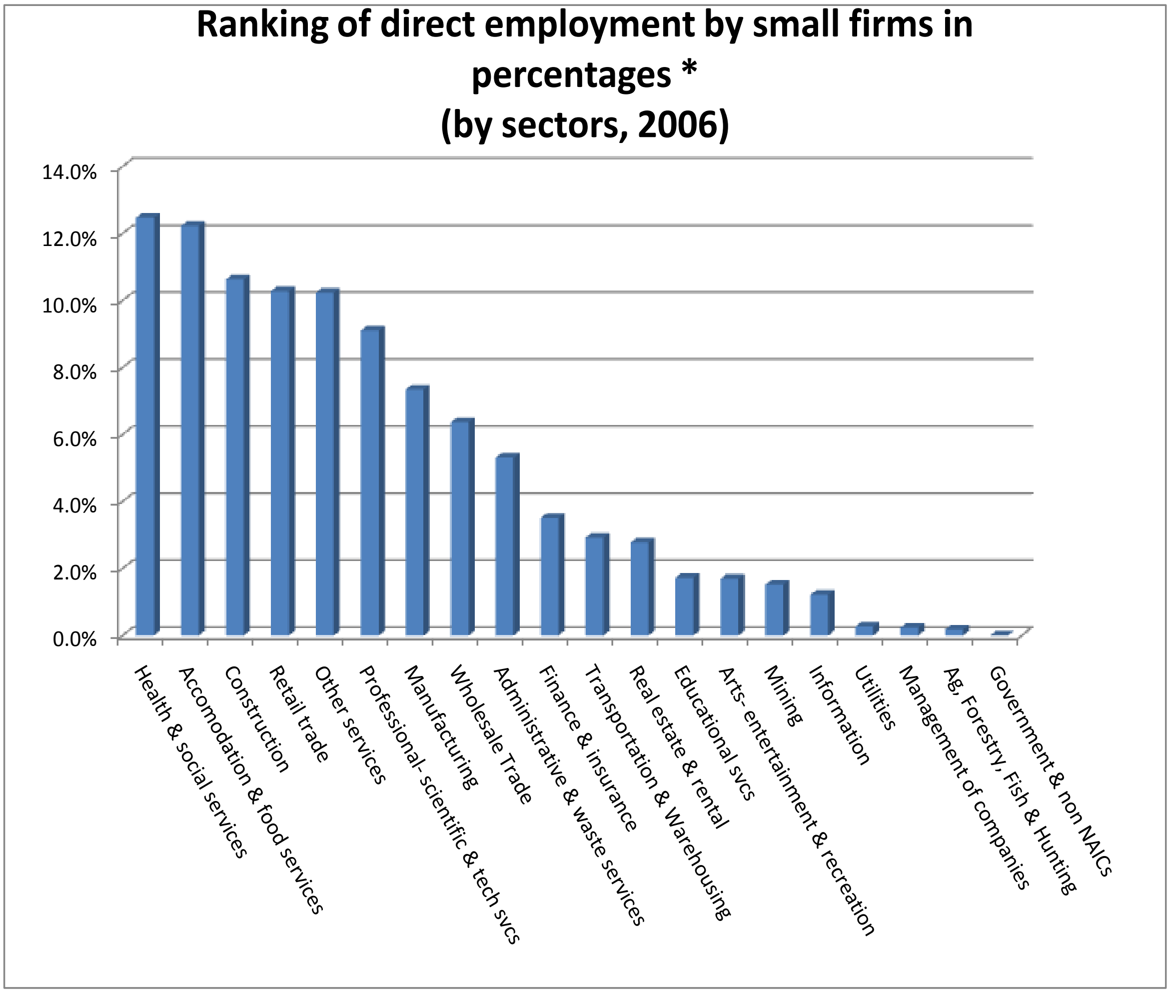
[6] But in the study, the indirect and induced effects related to the government sector were included in the estimations as they are responses to private sector activities.

[7] IMPLAN is a system of software and databases produced by the Minnesota IMPLAN Group (MIG).

[8] In great part, this methodology follows Isserman and Westervelt recommended procedure with two stages: "The first stage—reducing uncertainty—mines all available information to identify the narrowest range within which each missing number must fall. The second stage—creating employment estimates—replaces each missing number with an estimate that is within its range and consistent with all the other actual and estimated numbers." From: 1.5 Million missing numbers: Overcoming Employment Suppression in County Business Patterns Data. Andrew M. Isserman and James Westervelt, *International Regional Science Review* 2006; 29; 311. Also, it follows some optimization aspects recommended by Zhang and Guldmann in the online version of: Estimating suppressed data in regional economic databases: A goal programming approach. Sumei Zhang and Jean-Michel Guldmann, *European Journal of Operational Research* 192 (2009) 521-537 at http://www.sciencedirect.com

Chart 1



* Only direct employment

Economic impacts of Texas small firms employers

For Texas, in 2006, the estimated employment impact of SBL100 employer firms was close to 5.5 million jobs, the value added or (gross state product) impact was $ 406.2 billion, and the economic impact, measured in terms of output, was $771.0 billion. The following sections explain these impacts.

Employment

Table 3 exhibits estimated employment impacts across 20 two-digit NAICS code sectors. It shows the direct, indirect, induced, and total employment effects of SBL100 firms in the state of Texas for 2006: from a direct impact of 2.9 million jobs to an estimated total impact of 5.5 million jobs. Their total impact is the summation of the three effects, and it is the basis for the ranking in the table.

Table 3

TEXAS: EMPLOYER
EMPLOYMENT IMPACTS OF SMALL FIRMS WITH LESS THAN 100 WORKERS
(Thousands of workers for 2006)

NAICS	Sector	Direct	Indirect	Induced	Total
44-45	Retail trade	294	62	296	653
62	Health & social services	357	3	241	601
72	Accomodation & food services	350	47	154	551
54	Professional- scientific & tech svcs	261	198	63	521
81	Other services	293	38	144	476
56	Administrative & waste services	152	194	61	407
23	Construction	304	13	5	322
31-33	Manufacturing	210	57	43	310
42	Wholesale Trade	182	68	55	306
52	Finance & insurance	100	80	77	258
92	Government & non NAICs	0	37	206	243
48-49	Transportation & Warehousing	84	93	41	217
53	Real estate & rental	79	70	47	196
71	Arts- entertainment & recreation	49	22	39	109
61	Educational svcs	49	3	28	81
51	Information	35	24	16	75
11	Ag, Forestry, Fish & Hunting	5	39	30	73
21	Mining	43	21	5	69
55	Management of companies	7	17	5	29
22	Utilities	8	4	5	16
	Totals	2,863	1,091	1,560	5,514

Source: Statistics of U.S. Businesses, 2006 data. Simulations with IMPLAN v2, and IMPLAN 2006 data

At the top of the list is the retail trade sector (653 thousand jobs). This estimated total impact is mostly explained by its relatively large induced effect (296 thousand jobs); but based on its direct employment this sector is ranked fourth among all sectors. On the contrary, its indirect effect is relatively small. The induced effect explains changes in the economy due to additional spending by households as a result of the jobs created directly and indirectly in the region.

The health and social services sector (601 thousand jobs), and the accommodation and food services sector (551 thousand jobs) show similar patterns to the retail sector: large induced effects with relatively low indirect effects. All these three sectors also share a relatively large direct employment effect. It is precisely this large direct employment that generates large induced effects.

On the other hand, the professional, scientific and technical services sector (521 thousand jobs); and the administrative and waste services sector (407 thousand jobs) show relatively small induced effects and large indirect effects. The latter effects have the beneficial effect of integrating the sectors to the regional economy.

A look into the subsectors and industries included in the top sectors offers a better understanding of the impacts (table 4).[9] For example, industries in the subsector professional subsector include: architectural and engineering services, accounting firms, legal services, computer systems design, scientific research and development services, among others. The subsector ambulatory health care includes offices of physician and dentists among others.

[9] Subsectors are three-digit NAICS code activities, and industry groups are four-digit NAICS code activities, therefore, they all are included in their respective sector. The definitions were taken from the Census web site on February 5, 2010 at http://www.census.gov/eos/www/naics

Table 4

Selected Employment by Sectors and Subsectors

Two-digit NAICS	Sector	Subsector	Employment total impact (thousands of jobs)
54	Professional- scientific & tech svcs	Professional- scientific & tech svcs	521
72	Accomodation & food services	Food svcs & drinking places	487
62	Health & social services	Ambulatory health care	349
		Social assistance	133
44-45	Retail Trade	Motor veh & parts dealers	107
23	Construction	Construction	322
81	Other services	Religious- grantmaking- & similar orgs	212

The following definitions were taken from the Census web information and serve to understand the importance of each subsector:

Subsector: Professional, Scientific, and Technical Services

Industries in the Professional, Scientific, and Technical Services subsector group establishments engaged in processes where human capital is the major input. These establishments make available the knowledge and skills of their employees, often on an assignment basis, where an individual or team is responsible for the delivery of services to the client. The individual industries of this subsector are defined on the basis of the particular expertise and training of the services provider.

The distinguishing feature of the Professional, Scientific, and Technical Services subsector is the fact that most of the industries grouped in it have production processes that are almost wholly dependent on worker skills. In most of these industries, equipment and materials are not of major importance, unlike health care, for example, where "high tech" machines and materials are important collaborating inputs to labor skills in the production of health care. Thus, the establishments classified in this subsector sell expertise. Much of the expertise requires degrees, though not in every case. Industries this subsector include: architectural and engineering services, accounting firms, legal services, computer systems design, scientific research and development services, among others.

Subsector: Motor vehicle and parts dealers

Industries in the Motor Vehicle and Parts Dealers subsector retail motor vehicle and parts merchandise from fixed point-of-sale locations. Establishments in this subsector typically operate from a showroom and/or an open lot where the vehicles are on display. The display of vehicles and the related parts require little by way of display equipment. The personnel generally include both the sales and sales support staff familiar with the requirements for registering and financing a vehicle as well as a staff of parts experts and mechanics trained to provide repair and maintenance services for the vehicles.

Subsector: Food services and drinking places

Industries in the Food Services and Drinking Places subsector prepare meals, snacks, and beverages to customer order for immediate on-premises and off-premises consumption. There is a wide range of establishments in these industries. Some provide food and drink only; while others provide various combinations of seating space, waiter/waitress services and incidental amenities, such as limited entertainment. The industries in the subsector are grouped based on the type and level of services provided. The industry groups are full-service restaurants; limited-service eating places; special food services, such as food service contractors, caterers, and mobile food services; and drinking places.

Subsector: Religious, grantmaking, civic, professional, and similar organizations

Industries in the Religious, Grantmaking, Civic, Professional, and Similar Organizations subsector group establishments that organize and promote religious activities; support various causes through grantmaking; advocate various social and political causes; and promote and defend the interests of their members.

Subsector: Ambulatory health care services

Industries in the Ambulatory Health Care Services subsector provide health care services directly or indirectly to ambulatory patients and do not usually provide inpatient services. Health practitioners in this subsector provide outpatient services, with the facilities and equipment not usually being the most significant part of the production process. These include offices of physician and dentists among others.

Subsector: Social Assistance

Industries in the Social Assistance subsector provide a wide variety of social assistance services directly to their clients. These services do not include residential or accommodation services, except on a short stay basis.

Value Added

Table 5 summarizes value added impacts across the 20 sectors included. The study uses the category value added because this category offers a good measure of the economic contributions of an industry to its surrounding area. "Compared to sales, value added is a preferable measure of production because it indicates the extent to which a firm's sales result from their own production rather than from production that originates elsewhere, whereas sales data do not distinguish between these two sources of production."[10]

Table 5

TEXAS EMPLOYER
VALUE ADDED IMPACTS OF SMALL FIRMS WITH LESS THAN 100 WORKERS
(Millions of dollars 2006)

NAICS	Sector	Direct	Indirect	Induced	Total
54	Professional- scientific & tech svcs	$20,477	$15,539	$4,925	$40,940
42	Wholesale Trade	$24,088	$9,036	$7,275	$40,400
31-33	Manufacturing	$24,179	$8,516	$5,226	$37,921
53	Real estate & rental	$16,287	$10,805	$6,408	$33,500
44-45	Retail trade	$14,992	$2,815	$13,289	$31,096
62	Health & social services	$17,738	$201	$11,823	$29,762
21	Mining	$15,161	$11,100	$2,571	$28,832
52	Finance & insurance	$10,050	$8,763	$8,421	$27,233
92	Government & non NAICs	$0	$3,532	$19,705	$23,237
23	Construction	$16,892	$706	$275	$17,873
56	Administrative & waste services	$5,985	$7,279	$2,297	$15,561
72	Accomodation & food services	$9,532	$1,647	$4,261	$15,440
81	Other services	$9,429	$1,412	$3,677	$14,517
48-49	Transportation & Warehousing	$6,017	$5,787	$2,618	$14,423
22	Utilities	$6,194	$3,106	$3,788	$13,088
51	Information	$5,412	$3,951	$2,713	$12,075
71	Arts- entertainment & recreation	$1,450	$672	$1,170	$3,291
55	Management of companies	$695	$1,800	$516	$3,011
61	Educational svcs	$1,567	$99	$901	$2,567
11	Ag, Forestry, Fish & Hunting	$219	$672	$533	$1,424
		$206,363	$97,438	$102,391	$406,192

Source: Statistics of U.S. Businesses, 2006 data. Simulations with IMPLAN v2, and IMPLAN 2006 data

[10] Bureau of Economic Analysis' web site. Value added is another name for Gross State Product.

As with employment impacts, the table shows the direct, indirect, induced, and total impacts of the SBL100 firms in Texas. Different from the employment impacts, the ranking based on total value added impacts is headed by professional, scientific and technical services ($40,940 million) followed by wholesale trade ($40,400 million); manufacturing ($37,921 million); real estate and rental ($33,500 million); and retail trade ($31,096 million). Similar to the employment impacts, there are great variations in the relative importance of indirect and induced effects.

Both, professional, scientific and technical services; and the real estate and rental sectors show relatively large indirect effects indicating strong ties with Texan suppliers. On the other hand, retail trade exhibits relatively low indirect impacts and large induced impacts. Sectors like wholesale trade and manufacturing show middle of the road impacts in both categories: indirect and induced effects.

A look into the subsectors and industries included in the top sectors offers a better understanding of the impacts (table 6).[11] For example, the wholesale trade sector comprises two main types of wholesalers: merchant wholesalers that sell goods on their own account and business to business electronic markets, agents, and brokers that arrange sales and purchases for others generally for a commission or fee. The real estate subsector includes equity Real Estate Investment Trusts (REITs) that are primarily engaged in leasing buildings, dwellings, or other real estate property to others.

Table 6

Selected Sectors and Subsectors Value Added

Two-digit NAICS	Sector	Subsector	Value Added total impact (millions of dollars)
54	Professional- scientific & tech svcs	Professional- scientific & tech svcs	$40,940
42	Wholesale Trade	Wholesale Trade	$40,400
53	Real estate & rental	Real estate	$22,465
62	Health & social services	Ambulatory health care	$21,800
31-33	Manufacturing	Chemical manufacturing	$7,022
21	Mining	Oil & gas extraction	$21,301

[11] The definitions were taken from the Census web site on February 5, 2010 at http://www.census.gov/eos/www/naics

As explained earlier, details of the subsectors and industry groups for professional, scientific and technical services; and health and social services were already provided. In this section, the new subsectors are wholesale trade, real estate, chemical manufacturing, and oil and gas extraction.[12]

Subsector: Wholesale trade

The Wholesale Trade sector comprises establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. The merchandise described in this sector includes the outputs of agriculture, mining, manufacturing, and certain information industries, such as publishing.

This sector comprises two main types of wholesalers: merchant wholesalers that sell goods on their own account and business to business electronic markets, agents, and brokers that arrange sales and purchases for others generally for a commission or fee.

(1) Establishments that sell goods on their own account are known as wholesale merchants, distributors, jobbers, drop shippers, and import/export merchants. Also included as wholesale merchants are sales offices and sales branches (but not retail stores) maintained by manufacturing, refining, or mining enterprises apart from their plants or mines for the purpose of marketing their products. Merchant wholesale establishments typically maintain their own warehouse, where they receive and handle goods for their customers. Goods are generally sold without transformation, but may include integral functions, such as sorting, packaging, labeling, and other marketing services.

(2) Establishments arranging for the purchase or sale of goods owned by others or purchasing goods, generally on a commission basis are known as business to business electronic markets, agents and brokers, commission merchants, import/export agents and brokers, auction companies, and manufacturers' representatives. These establishments operate from offices and generally do not own or handle the goods they sell.

Subsector: Real estate

Industries in the Real Estate subsector group establishments that are primarily engaged in renting or leasing real estate to others; managing real estate for others; selling, buying, or renting real estate for others; and providing other real estate related services, such as appraisal services. This subsector includes equity Real Estate Investment Trusts (REITs) that are primarily engaged in leasing buildings, dwellings, or other real estate property to others.

[12] These definitions were taken from the Census web site.

Subsector: Oil and gas extraction

Industries in the Oil and Gas Extraction subsector operate and/or develop oil and gas field properties. Such activities may include exploration for crude petroleum and natural gas; drilling, completing, and equipping wells; operating separators, emulsion breakers, and field gathering lines for crude petroleum and natural gas; and all other activities in the preparation of oil and gas up to the point of shipment from the producing property. This subsector includes the production of crude petroleum, the mining and extraction of oil from oil shale and oil sands, and the production of natural gas, sulfur recovery from natural gas, and recovery of hydrocarbon liquids.

Subsector: Chemical manufacturing

The Chemical Manufacturing subsector is based on the transformation of organic and inorganic raw materials by a chemical process and the formulation of products. This subsector distinguishes the production of basic chemicals that comprise the first industry group from the production of intermediate and end products produced by further processing of basic chemicals that make up the remaining industry groups.

This subsector does not include all industries transforming raw materials by a chemical process. It is common for some chemical processing to occur during mining operations.

Output

Table 7 provides an overview of output impacts across the 20 sectors included in the presentation tables for this study. Output "represents the value of industry production. (…) these are annual production estimates for the year of the data set and are in producer prices. For manufacturers this would be sales plus/minus change in inventory. For service sectors production [equals] sales. For retail and wholesale trade, output [equals] gross margin and not gross sales."[13]

Table 7

TEXAS: EMPLOYERS
OUTPUT IMPACTS OF SMALL FIRMS WITH LESS THAN 100 WORKERS
(Millions of dollars 2006)

NAICS	Sector	Direct	Indirect	Induced	Total
31-33	Manufacturing	$92,534	$43,220	$25,800	$161,555
54	Professional- scientific & tech svcs	$35,379	$26,848	$8,509	$70,736
42	Wholesale Trade	$35,719	$13,399	$10,788	$59,907
53	Real estate & rental	$27,428	$16,823	$9,702	$53,953
52	Finance & insurance	$17,839	$14,819	$14,957	$47,615
44-45	Retail trade	$22,592	$4,265	$20,185	$47,043
62	Health & social services	$27,061	$301	$18,845	$46,208
21	Mining	$24,479	$17,499	$4,049	$46,028
23	Construction	$37,131	$1,552	$604	$39,288
72	Accomodation & food services	$18,959	$2,977	$8,417	$30,352
81	Other services	$18,747	$2,829	$6,894	$28,469
48-49	Transportation & Warehousing	$11,058	$10,157	$4,948	$26,163
92	Government & non NAICs	$0	$3,909	$21,807	$25,716
56	Administrative & waste services	$9,777	$11,740	$3,708	$25,225
51	Information	$10,982	$8,278	$5,706	$24,966
22	Utilities	$8,206	$4,116	$5,019	$17,341
71	Arts- entertainment & recreation	$2,497	$1,052	$1,970	$5,518
11	Ag, Forestry, Fish & Hunting	$666	$2,678	$1,956	$5,301
55	Management of companies	$1,223	$3,166	$907	$5,296
61	Educational svcs	$2,664	$168	$1,531	$4,364
		$404,942	$189,797	$176,305	$771,044

Source: Statistics of U.S. Businesses, 2006 data. Simulations with IMPLAN v2, and IMPLAN 2006 data

[13] From the glossary for IMPLAN, MIG's web site taken on January 25, 2010 at http://implan.com/v3

The greatest value of output was found in manufacturing ($161,555 million) ahead of the professional, scientific and technical services ($70,736 million); wholesale trade ($59,907); real estate and rental ($53,953 million); and finance and insurance ($47,615 million). Among these sectors, manufacturing output stands out for its large effects, more than double than the next sector. As explained in the section about value added in reference to sales, these output measures do not distinguish between production from Texas own resources and from production from other areas of the U.S. and the world. It is usually used because of the easiness to understand sales (almost the same as output) dollars numbers.

All subsectors and industry groups were explained in a previous section with the exception of insurance carriers and related, and lessors of nonfinancial intangible assets. Table 8 shows the most important industries based on output impacts. Industries in the subsector lessors of nonfinancial intangible asset had an important role in the extraordinary growth of the oil and gas industries, as owners of land received more royalties for their assets.

Table 8

Selected Sectors and Subsectors Output

Two-digit NAICS	Sector	Subsector	Output total impact (millions of dollars)
54	Professional- scientific & tech svcs	Professional- scientific & tech svcs	$70,736
42	Wholesale Trade	Wholesale Trade	$59,907
31-33	Manufacturing	Chemical Manufacturing	$40,717
23	Construction	Construction	$39,288
52	Finance and insurance	Insurance carriers and related	$10,146
		Lessor of nonfinance intang assets	$8,585
21	Mining	Oil & gas extraction	$33,500

Subsector: Insurance carriers and related

Industries in the Insurance Carriers and Related Activities subsector group establishments that are primarily engaged in one of the following: (1) underwriting (assuming the risk, assigning premiums, and so forth) annuities and insurance policies or (2) facilitating such underwriting by selling insurance policies, and by providing other insurance and employee-benefit related services.

Subsector: Lessors of nonfinancial intangible assets

Industries in the Lessors of Nonfinancial Intangible Assets (except Copyrighted Works) subsector include establishments that are primarily engaged in assigning rights to assets, such as patents, trademarks, brand names, and/or franchise agreements for which a royalty payment or licensing fee is paid to the asset holder. Establishments in this subsector own the patents, trademarks, and/or franchise agreements that they allow others to use or reproduce for a fee and may or may not have created those assets.

Establishments that allow franchisees the use of the franchise name, contingent on the franchisee buying products or services from the franchisor, are classified elsewhere.

Economic impacts of Texas non-employers

In 2006, the estimated total employment impact of SBL100 firms was close to 1.2 million jobs, the value added or (gross state product) impact was estimated at $ 80.5 billion, and the economic impact, measured in terms of output, was close to $144.7 billion. The following sections explain these impacts in detail.

Employment

Table 9 exhibits employment impacts across 20 sectors. It shows the direct, indirect, induced, and total employment effects of non-employers in the state of Texas in 2006: from a direct impact of 783 thousand jobs to a total impact of 1,265 thousand jobs. To produce these tables, three assumptions for (and the other non-employer impacts) were made and need some explanation.

In first place, the information from SUSB for non-employers does not show any employment numbers because by definition there are no employees for these types of firms. The numbers shown in the table were imputed by the software, IMPLAN, according to the amount of receipts indicated in the SUSB data.

In second place, the values of receipts were assumed to represent output of the sectors. As discussed before, sales are not necessarily the same as output. We are assuming that the differences are not large enough to modify the main findings.

Finally, the amounts of receipts for the retail trade sector were adjusted to lower values to estimate output in this sector. As mentioned earlier, output for retail trade is equal to gross margin and not to the sales reported by the firms.

The largest sectors are: other services (165 thousand jobs); health and social services (148 thousand jobs); professional, scientific and technical services (112, thousand jobs); retail trade (103 thousand jobs); and transportation and warehousing (88 thousand jobs) together with real estate and rental (also 88 thousand jobs). As before, there are differences in the relative importance of indirect and induced effects.

Table 9

TEXAS: NON-EMPLOYER
EMPLOYMENT IMPACTS OF SMALL FIRMS WITH LESS THAN 100 WORKERS
(Thousands of workers for 2006)

NAICS	Sector	Direct	Indirect	Induced	Total
81	Other services	131	9	25	165
62	Health & social services	106	0	42	148
54	Professional- scientific & tech svcs	73	29	10	112
44-45	Retail trade	40	9	55	103
48-49	Transportation & Warehousing	60	21	7	88
53	Real estate & rental	62	17	9	88
56	Administrative & waste services	14	46	12	72
71	Arts- entertainment & recreation	55	6	7	68
52	Finance & insurance	32	21	15	67
72	Accomodation & food services	26	10	28	64
21	Mining	44	4	1	48
11	Ag, Forestry, Fish & Hunting	22	2	5	29
23	Construction	20	4	1	26
31-33	Manufacturing	4	9	7	20
61	Educational svcs	13	0	6	19
42	Wholesale Trade	0	8	10	17
51	Information	4	5	3	12
92	Government & non NAICs	0	3	3	6
55	Management of companies	0	3	1	4
22	Utilities	0	1	1	2
	Total	706	205	247	1,158

Source: Statistics of U.S. Businesses, 2006 data. Simulations with IMPLAN v2, and IMPLAN 2006 data

Value Added

Table 10 exhibits the value added impacts of SBL100 firms. Here, at the top of the ranking are: mining ($12,694 million); real estate and rental ($12,223 million); professional, scientific and technical services ($9,920 million); finance and insurance ($5,737 million); and transportation and warehousing ($5,002 million). Value added is the most important indicator of the contribution of an industry or firm to the surrounding area.

Table 10

TEXAS: NON-EMPLOYER
VALUE ADDED IMPACTS OF SMALL FIRMS WITH LESS THAN 100 WORKERS
(Millions of dollars 2006)

NAICS	Sector	Direct	Indirect	Induced	Total
21	Mining	$10,505	$1,791	$398	$12,694
53	Real estate & rental	$8,425	$2,636	$1,162	$12,223
54	Professional- scientific & tech svcs	$6,894	$2,270	$756	$9,920
52	Finance & insurance	$2,162	$1,998	$1,578	$5,737
48-49	Transportation & Warehousing	$3,239	$1,302	$461	$5,002
81	Other services	$3,776	$281	$636	$4,694
62	Health & social services	$2,356	$2	$2,171	$4,529
44-45	Retail trade	$1,612	$384	$2,457	$4,454
56	Administrative & waste services	$1,891	$1,555	$395	$3,842
92	Government & non NAICs	$2	$173	$3,620	$3,795
31-33	Manufacturing	$444	$1,339	$812	$2,594
42	Wholesale Trade	$0	$1,021	$1,279	$2,300
72	Accomodation & food services	$745	$394	$768	$1,906
22	Utilities	$68	$860	$665	$1,594
51	Information	$314	$623	$495	$1,432
23	Construction	$1,028	$217	$71	$1,315
71	Arts- entertainment & recreation	$674	$168	$216	$1,058
11	Ag, Forestry, Fish & Hunting	$403	$60	$101	$564
61	Educational svcs	$290	$11	$182	$483
55	Management of companies	$0	$310	$100	$410
	Total	$44,827	$17,396	$18,324	$80,548

Source: Statistics of U.S. Businesses, 2006 data. Simulations with IMPLAN v2, and IMPLAN 2006 data

Output

Based on SUSB data, table 11 summarizes the output impacts across the 20 sectors included in the presentation of the study. Heading the list is mining ($24,000 million); followed by real estate and rental ($18,049 million); professional, scientific and technical services ($15,772 million); finance and insurance ($11,385 million); and manufacturing ($11,243 million). The last sector, manufacturing, moved up compared to employment and value added rankings.

Table 11

TEXAS: NON-EMPLOYER OUTPUT IMPACTS OF SMALL FIRMS WITH LESS THAN 100 WORKERS (Millions of dollars 2006)					
NAICS	**Sector**	**Direct**	**Indirect**	**Induced**	**Total**
21	Mining	$20,554	$2,824	$621	$24,000
53	Real estate & rental	$12,259	$4,044	$1,746	$18,049
54	Professional- scientific & tech svcs	$10,452	$3,977	$1,343	$15,772
52	Finance & insurance	$5,060	$3,433	$2,892	$11,385
31-33	Manufacturing	$1,289	$6,324	$3,630	$11,243
48-49	Transportation & Warehousing	$6,772	$2,312	$869	$9,954
81	Other services	$6,825	$544	$1,206	$8,576
62	Health & social services	$3,833	$4	$3,478	$7,315
44-45	Retail trade	$2,321	$582	$3,733	$6,635
56	Administrative & waste services	$3,226	$2,474	$645	$6,345
92	Government & non NAICs	$3	$403	$4,298	$4,704
72	Accomodation & food services	$1,435	$688	$1,521	$3,644
23	Construction	$2,911	$504	$155	$3,570
42	Wholesale Trade	$0	$1,514	$1,896	$3,410
51	Information	$754	$1,336	$1,065	$3,155
22	Utilities	$84	$1,103	$885	$2,073
71	Arts- entertainment & recreation	$1,404	$282	$362	$2,048
11	Ag, Forestry, Fish & Hunting	$811	$162	$324	$1,297
61	Educational svcs	$466	$19	$308	$792
55	Management of companies	$0	$546	$176	$722
	Total	$80,460	$33,075	$31,154	$144,690

Source: Statistics of U.S. Businesses, 2006 data. Simulations with IMPLAN v2, and IMPLAN 2006 data

Combined impacts of Texas employers and non-employers

In 2006, the estimated combined total employment impact of non-employers and employers with less than 100 workers was close to 6.7 million jobs, the estimated value added or (gross state product) impact was $486.7 billion, the yearly average output (production) impact was $915.7 billion. The following sections explain these impacts.

Employment

Non-employers and employer with less than 100 workers totaled 3.6 million direct jobs. Based on Census data, this figure represented close to 41 percent of non-farm, private firms employment in Texas.[14] As mentioned previously, BEA's total private employment is larger because it includes the self-employed, and according to this source, direct employment effects by SBL100 firms represented 31 percent of BEA's total. The estimated total impact is close to 6.7 million.

Table 12 aggregates the employment impacts of SBL100 employers and non-employers for Texas. At the top of the list of 20 sectors is retail trade with a total estimated employment impact of 756 thousand jobs; followed by health and social services with 749 thousand; other services with 641 thousand; and professional, scientific and technical services with 633 thousand jobs.

Another way to understand the contributions of small firms is to calculate their relative importance by sector: ranking the sectors according to the percentage of employment by SBL100 firms with respect to the total in that sector.

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[14] Based on the Census (SUSB) data Texas has 8.7 million non-farm, private jobs. Based on BEA data: in 2006, Texas had a private employment of 11.5 million. The data from IMPLAN are very close to BEA's information. See the Appendix A for both sources information.

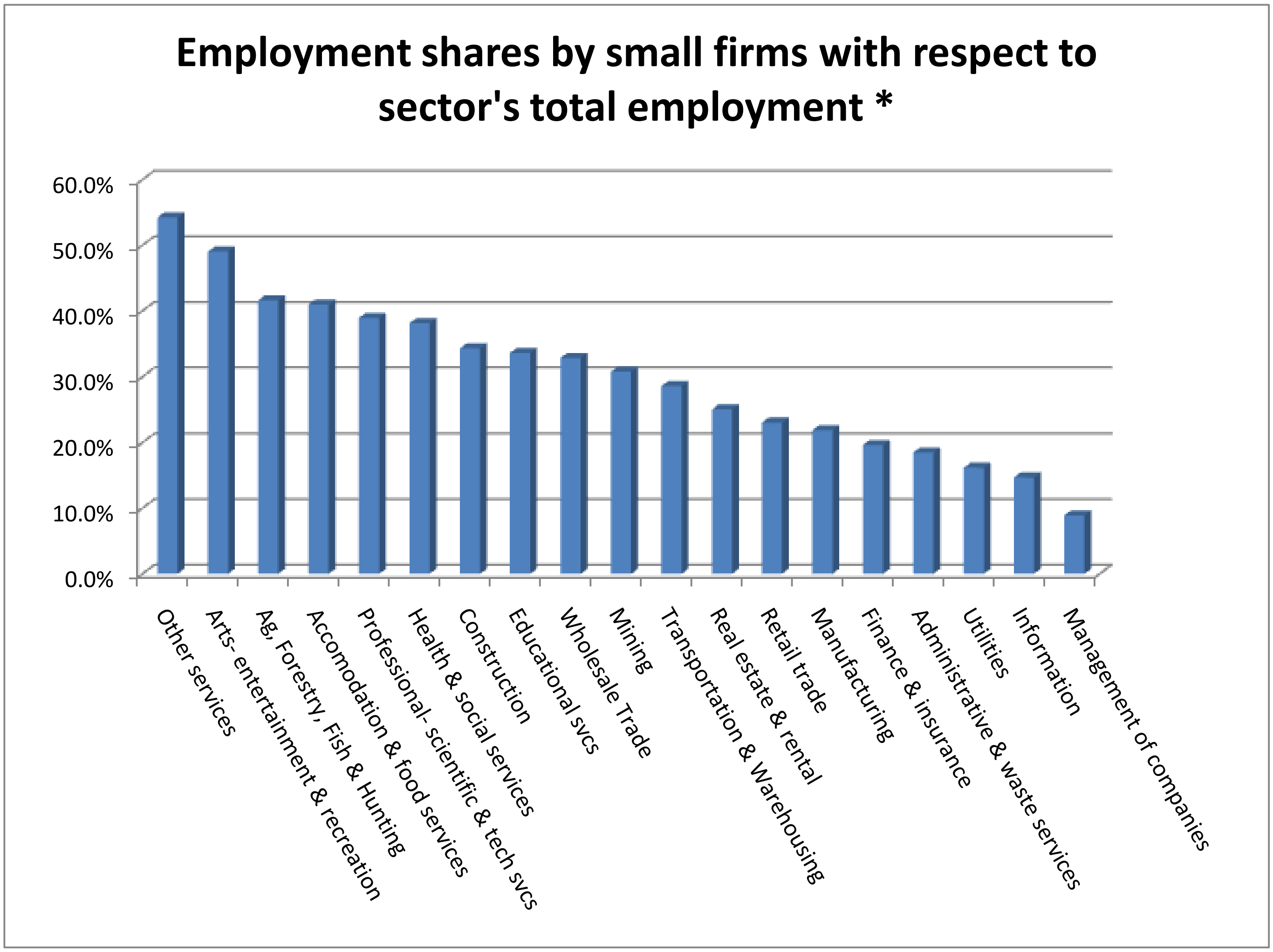
Table 12

TEXAS: EMPLOYER AND NON-EMPLOYER
EMPLOYMENT IMPACTS OF SMALL FIRMS WITH LESS THAN 100 WORKERS
(Thousands of workers for 2006)

NAICS	Sector	Direct	Indirect	Induced	Total
44-45	Retail trade	334	71	351	756
62	Health & social services	463	3	283	749
81	Other services	424	47	170	641
54	Professional- scientific & tech svcs	333	227	73	633
72	Accomodation & food services	376	58	182	615
56	Administrative & waste services	166	240	73	479
23	Construction	325	17	6	348
31-33	Manufacturing	214	66	49	330
52	Finance & insurance	132	101	91	324
42	Wholesale Trade	182	76	65	323
48-49	Transportation & Warehousing	144	113	48	305
53	Real estate & rental	141	87	56	284
92	Government & non NAICs	0	40	209	249
71	Arts- entertainment & recreation	103	28	46	177
21	Mining	87	25	5	117
11	Ag, Forestry, Fish & Hunting	28	41	34	103
61	Educational svcs	62	3	34	100
51	Information	39	29	19	87
55	Management of companies	7	20	6	33
22	Utilities	8	5	6	18
	Total	3,569	1,296	1,807	6,673

Chart 2 shows the ranking. In first place are other services (54.2 percent) with a majority of the employees working for SBL100 firms; it is followed by arts, entertainment and recreation (49.0 percent) with almost half the employees working for SBL100 firms.

Chart 2



* Only direct employment

Value Added

Value added is a good measure of the economic contributions of an industry to the surrounding area because it takes account of where the production of goods and services occurs. Table 14 exhibits the combined estimated value added impacts from non-employers and employers with less than 100 employees. The total direct value added of $251,190 million by these firms represented 26.3 percent of the GSP of $956,793 million for private firms in Texas in 2006.[15]

Table 14

TEXAS: EMPLOYER AND NON-EMPLOYER
VALUE ADDED IMPACTS OF SMALL FIRMS WITH LESS THAN 100 WORKERS
(Millions of dollars 2006)

NAICS	Sector	Direct	Indirect	Induced	Total
54	Professional- scientific & tech svcs	$27,370	$17,809	$5,681	$50,860
53	Real estate & rental	$24,711	$13,442	$7,571	$45,723
42	Wholesale Trade	$24,088	$10,057	$8,554	$42,700
21	Mining	$25,667	$12,890	$2,969	$41,526
31-33	Manufacturing	$24,622	$9,855	$6,039	$40,516
44-45	Retail trade	$18,230	$4,117	$13,750	$36,098
62	Health & social services	$20,093	$203	$13,994	$34,291
52	Finance & insurance	$12,212	$10,761	$9,998	$32,971
92	Government & non NAICs	$2	$3,705	$23,325	$27,033
56	Administrative & waste services	$7,877	$8,834	$2,692	$19,402
81	Other services	$13,205	$1,693	$4,313	$19,212
23	Construction	$17,920	$923	$346	$19,189
48-49	Transportation & Warehousing	$7,630	$6,171	$5,075	$18,876
72	Accomodation & food services	$10,276	$2,042	$5,028	$17,346
22	Utilities	$6,262	$3,966	$4,454	$14,682
51	Information	$5,725	$4,574	$3,208	$13,507
71	Arts- entertainment & recreation	$2,124	$840	$1,386	$4,349
55	Management of companies	$695	$2,110	$616	$3,421
61	Educational svcs	$1,857	$110	$1,083	$3,050
11	Ag, Forestry, Fish & Hunting	$622	$732	$634	$1,988
	Total	$251,190	$114,835	$120,716	$486,740

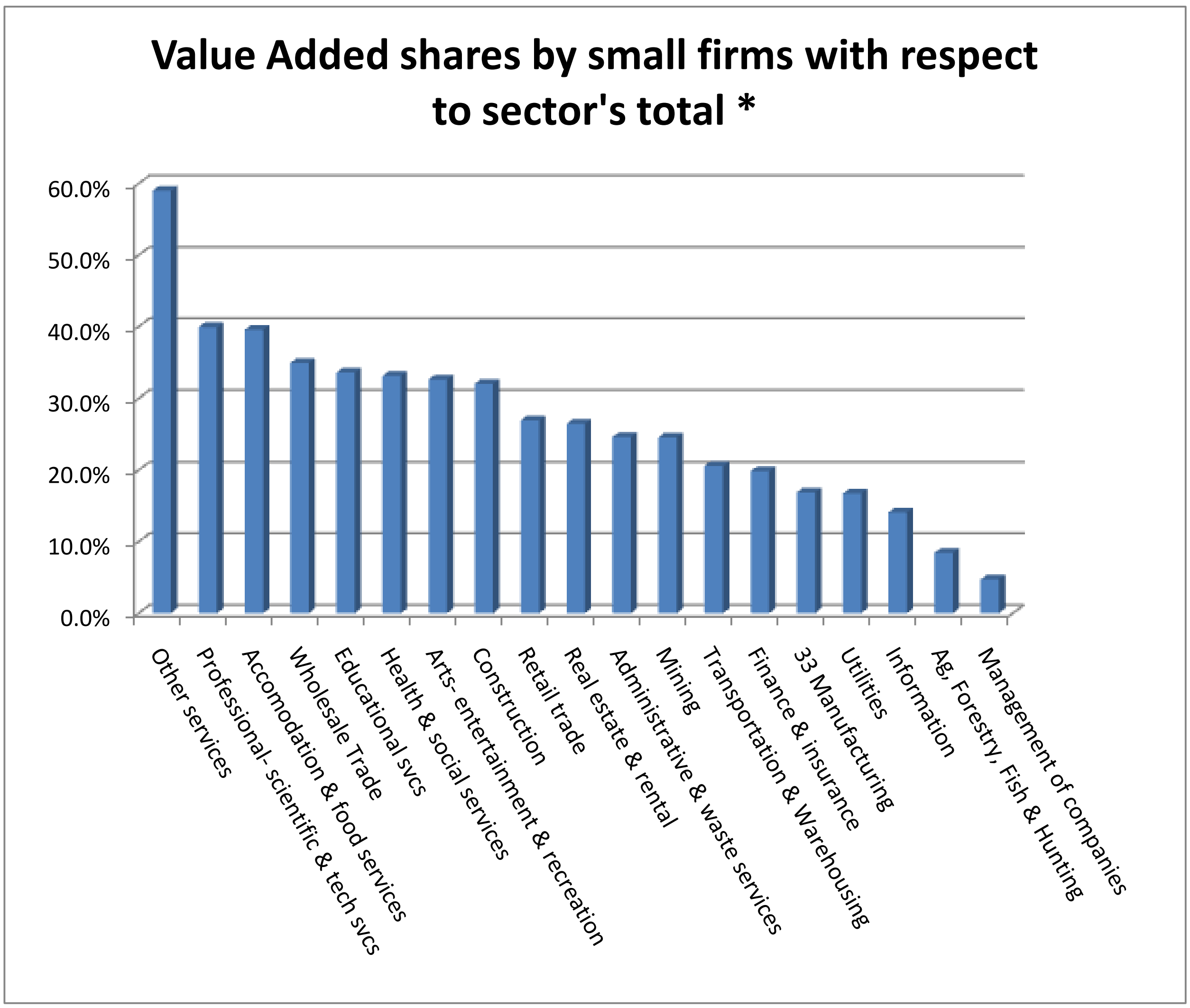
Source: Statistics of U.S. Businesses, 2006 data. Simulations with IMPLAN v2, and IMPLAN 2006 data

[15] This value added does not include the government sector. See the Appendix A for disaggregated value added (Gross State Product) data from the BEA.

In comparing the sectors, professional, scientific and technical services have the largest estimated total value added impact in the state. It is followed by real estate and rental ($45,723 million), wholesale trade ($42,700 million), mining ($41,526 million), and manufacturing ($40,516 million).

Chart 3 exhibits the percentage of direct value added produced by these firms with respect to their sectors. In first place of the list is the other services sector with 59.0 percent of the value added been produced by SBL100 firms. It is followed by professional, scientific and technical services with 39.9 percent; by accommodation and food services with 39.6 percent; wholesale trade with 34.9 percent; and by educational services with 33.6 percent.

Chart 3



* Only direct employment

At the bottom of the ranking is management of companies with 4.7 percent; agriculture, forestry, fish and hunting with 8.4 percent, information with 14.1 percent, utilities with 16.7 percent, and manufacturing with 16.9 percent.

Output

In 2006, output generated by SBL100 firms in Texas amounted to $485,402 million accounting for close to 23 percent of the all Texas output. As mentioned before, output values are close to sales [16] and they are usually the way economic developers use to assess industries importance. A better measurement of the contributions of an industry to its surrounding areas is value added. Nevertheless, output impacts are easy to understand and give estimates than can be related to value added impacts.

Table 16 shows a ranking that resembles the one for value added, but there is one important difference, it shows at the top of the list the manufacturing sector ($172,798 million) whereas in the value added ranking this sector was fifth in the list.

[16] See page 14 on this report for a definition of output.

Table 16

TEXAS: EMPLOYER AND NON-EMPLOYER
OUTPUT IMPACTS OF SMALL FIRMS WITH LESS THAN 100 WORKERS
(Millions of dollars 2006)

NAICS	Sector	Direct	Indirect	Induced	Total
31-33	Manufacturing	$93,824	$49,545	$29,430	$172,798
54	Professional- scientific & tech svcs	$45,831	$30,825	$9,852	$86,508
53	Real estate & rental	$39,687	$20,867	$11,448	$72,002
21	Mining	$45,033	$20,324	$4,671	$70,028
42	Wholesale Trade	$35,719	$14,913	$12,684	$63,317
52	Finance & insurance	$22,899	$18,251	$17,849	$58,999
44-45	Retail trade	$24,913	$4,847	$23,918	$53,678
62	Health & social services	$30,894	$305	$22,324	$53,523
23	Construction	$40,042	$2,056	$760	$42,857
81	Other services	$25,572	$3,373	$8,100	$37,045
48-49	Transportation & Warehousing	$17,831	$12,469	$5,817	$36,117
72	Accomodation & food services	$20,393	$3,665	$9,938	$33,997
56	Administrative & waste services	$13,003	$14,214	$4,353	$31,570
92	Government & non NAICs	$3	$4,312	$26,105	$30,420
51	Information	$11,736	$9,614	$6,771	$28,121
22	Utilities	$8,290	$5,219	$5,904	$19,413
71	Arts- entertainment & recreation	$3,901	$1,334	$2,332	$7,566
11	Ag, Forestry, Fish & Hunting	$1,478	$2,840	$2,281	$6,598
55	Management of companies	$1,223	$3,712	$1,083	$6,018
61	Educational svcs	$3,129	$187	$1,839	$5,156
	Total	$485,402	$222,873	$207,459	$915,734

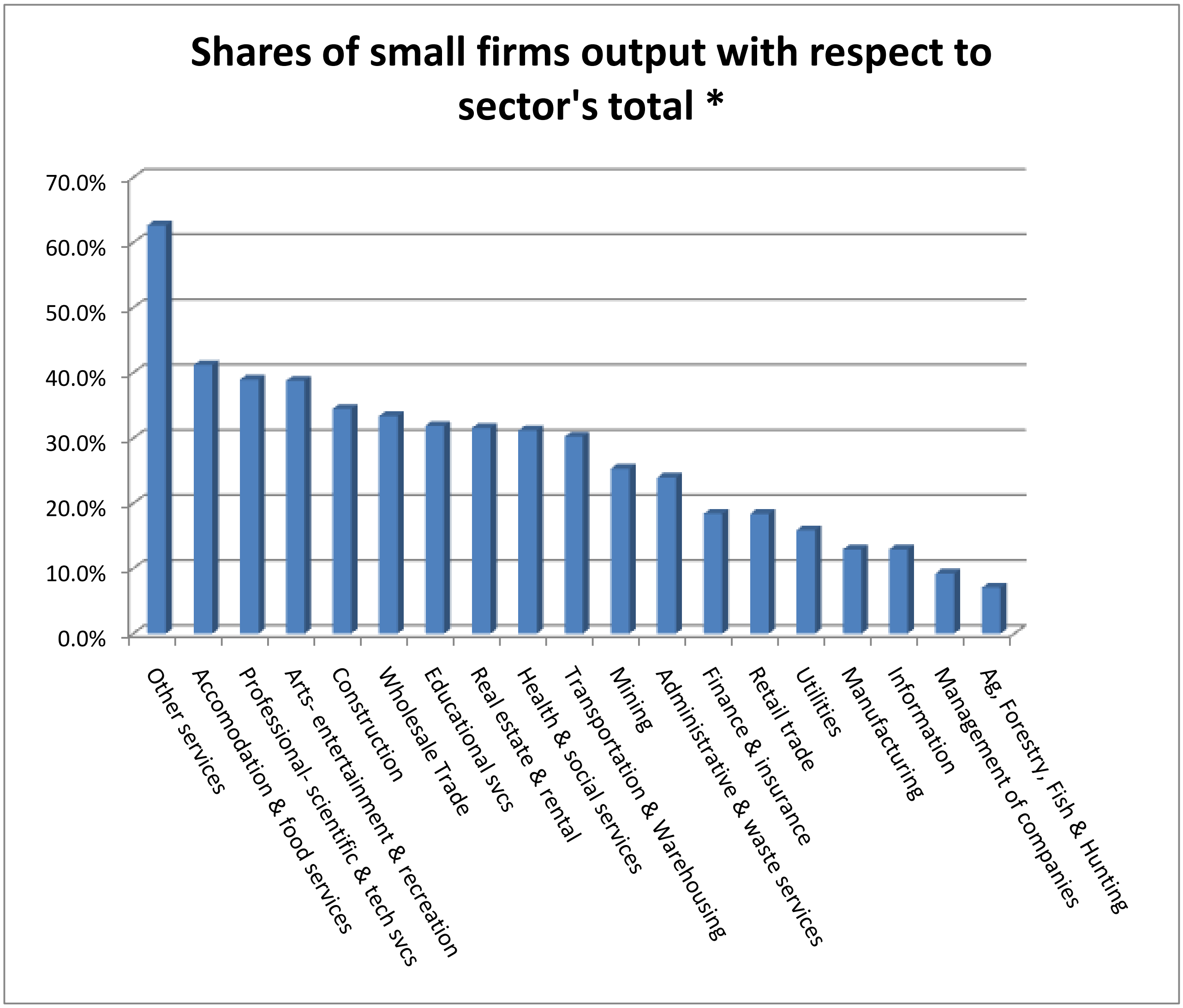
Source: Statistics of U.S. Businesses, 2006 data. Simulations with IMPLAN v2, and IMPLAN 2006 data

Following the ranking are professional, scientific and technical services ($86,508 million); real estate and rental ($72,002 million); mining ($70,028 million); and wholesale trade ($63,317 million). It is almost the same ranking with mining and wholesale trading positions.

At the bottom of the ranking, the last four sectors are the same as in the value added ranking but with educational services ($5,156 million) taking the last position preceded by management of companies ($6,018 million).

Chart 4 exhibits the percentage of direct output produced by SBL100 firms with respect to their sectors. In first place is the other services sector with 62.6 percent of the value added been produced by SBL100 firms. It is followed by accommodation and food services with 41.2 percent; professional, scientific and technical services with 38.9 percent; by arts, entertainment and recreation with 38.7 percent; and by construction with 34.5 percent.

Chart 4



* Only direct employment

Fiscal impacts

One important impact is the generation of tax and other nontax revenues to the state and to local governments. These revenues come in the form of sales, property or severance taxes; and in the form of fees and other nontax revenues. The activities of firms generate taxes and fees, and their wages and salaries allow workers to buy groceries, hardware, automobiles, doctors' appointments, lawyers' services, houses, and other goods and services that, in turn, pay taxes and generate fees. Therefore, it is not only the direct taxes and fees paid by the firms themselves but also those paid by the workers they hired and the workers of their suppliers. Their expenditures generate more production and more tax revenues.

For the state of Texas and all local governments in the state, the activities of SBL100 firms, employers and non-employers, generated $17,311 million in state revenues and $20,855 million in local government revenues in 2006 (Table 18).

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Table 18

TEXAS: Employer and Non-employer Fiscal Impacts (2006) (Millions of dollars)	
Estimated State Revenue	$17,311
Estimated Local Governments Revenue	$20,855

Economic impacts of clusters (by employer firms only)

According to the State Legislature: "industry cluster means a concentration of businesses and industries in a geographic region that are interconnected by the markets they serve, the products they produce, their suppliers, the trade associations to which their employees belong, and the educational institutions from which their employees or prospective employees receive training."[17]

Table 19 summarizes the estimated economic impacts of SBL100 employer firms according to the Texas Governor's definitions of industry clusters. In the table, clusters are ranked by their total value added impact to highlight their contributions to regional activities. The petroleum refining and chemical products cluster ($84,026 million) tops the list followed by biotechnology and life sciences ($40,588 million), energy ($29,417 million), information and computer technology ($25,209 million), advanced technologies and manufacturing ($25,188 million), and aerospace and defense ($6,146 million). This last sector may have been affected by the exclusion of all governmental direct impacts (federal, military, among others) to better capture the impacts from the private sector SBL100 firms.

Table 19

TEXAS EMPLOYERS'
IMPACTS OF SMALL FIRMS WITH LESS THAN 100 EMPLOYEES
IN TEXAS CLUSTERS (CORE ACTIVITIES) IN 2006
(millions of dollars)

Cluster	Direct employment	Total employment	Total Value Added	Total output	State Revenues
Petroleum Ref and Chemical Prod	50,831	464,689	$84,026	$228,001	$2,894
Biotechnology and Life Sciences	147,862	367,678	$40,588	$78,984	$1,246
Energy	131,596	255,793	$29,417	$49,352	$1,193
Information and Computer Technology	103,099	278,274	$25,209	$61,081	$654
Advanced Tech and Manufacturing	141,367	286,062	$25,188	$54,239	$608
Aerospace and Defense	21,996	56,653	$6,146	$12,698	$144

Even though the petroleum and refining and chemical products cluster is the smallest employer of the group, its estimated total employment impacts are tremendous surpassing the largest employer in the

[17] In the SB275, Government Code, Section 481.001 (6). Taken from Texas Industry Cluster Initiative Background at the Texas Workforce Commission web site: www.twc.state.tx.us/news/ticluster.html

group, biotechnology and life sciences. It also provides the largest output impacts and the largest collection of state revenues. The cluster's estimate total value added impact represents 8.8 percent of the gross state product.

When comparing the relative importance of the direct effects of SBL100 firms, a different picture arises. Table 20 summarizes the relative importance of these small firms. Using the value added criteria, two clusters stand out, biotechnology (19.0 percent) and energy (17.3 percent). [18] These two clusters exhibit the largest share of SBL100 employer firms in all categories of comparison: employment, output, state revenues, and, as mentioned, value added. At the other end, petroleum (4.2 percent) appears at the bottom of the list in value added importance but improves significantly when considering employment and state revenues shares. Advanced technologies is also another cluster where SBL100 employer firms' share is relatively important: more than a quarter of employment (27.5 percent) and more than a fifth (20.9 percent) in state revenues.

Table 20

RELATIVE IMPORTANCE
OF SMALL FIRMS EMPLOYERS WITH LESS THAN 100 EMPLOYEES
IN TEXAS CLUSTERS (CORE ACTIVITIES) IN 2006
(millions of dollars)

Cluster	Direct employment	Direct Value Added	Direct output	State Revenues Impact
Advanced Tech	27.5%	11.7%	12.3%	20.9%
Aerospace	15.2%	9.4%	10.4%	18.3%
Biotechnology	38.4%	19.0%	17.9%	36.1%
Energy	33.5%	17.3%	16.6%	25.4%
Information	22.4%	9.5%	12.2%	22.2%
Petroleum	21.1%	4.2%	10.0%	21.8%

The following tables summarize the impacts of the six clusters. They highlight the indirect and induced effects from each cluster. On the other hand, the figures summarize the relative importance of the six clusters among 24 Council of Governments (COG) areas.

[18] Appendix B shows the clusters employment, value added, output, tax revenues considering all firms in the clusters, not only small firms. It also repeats table 20 in a different order.

Petroleum Refining and Chemical Products Cluster

Table 21 details the estimated impacts on the petroleum refining and chemical products cluster from SBL100 firms. The large indirect employment and value added effects indicate strong economic ties to state suppliers which translate into large employment induced effects. Some of the industries included in this cluster are: basic organic chemical manufacturing; agricultural, construction, and mining machinery manufacturing; pipeline transportation of crude oil, pipeline transportation of natural gas; investment portfolio and miscellaneous financial services; among others.

Table 21

Estimated Impact for Petroleum Refining and Chemical Products Cluster (2006)
(millions of dollars)

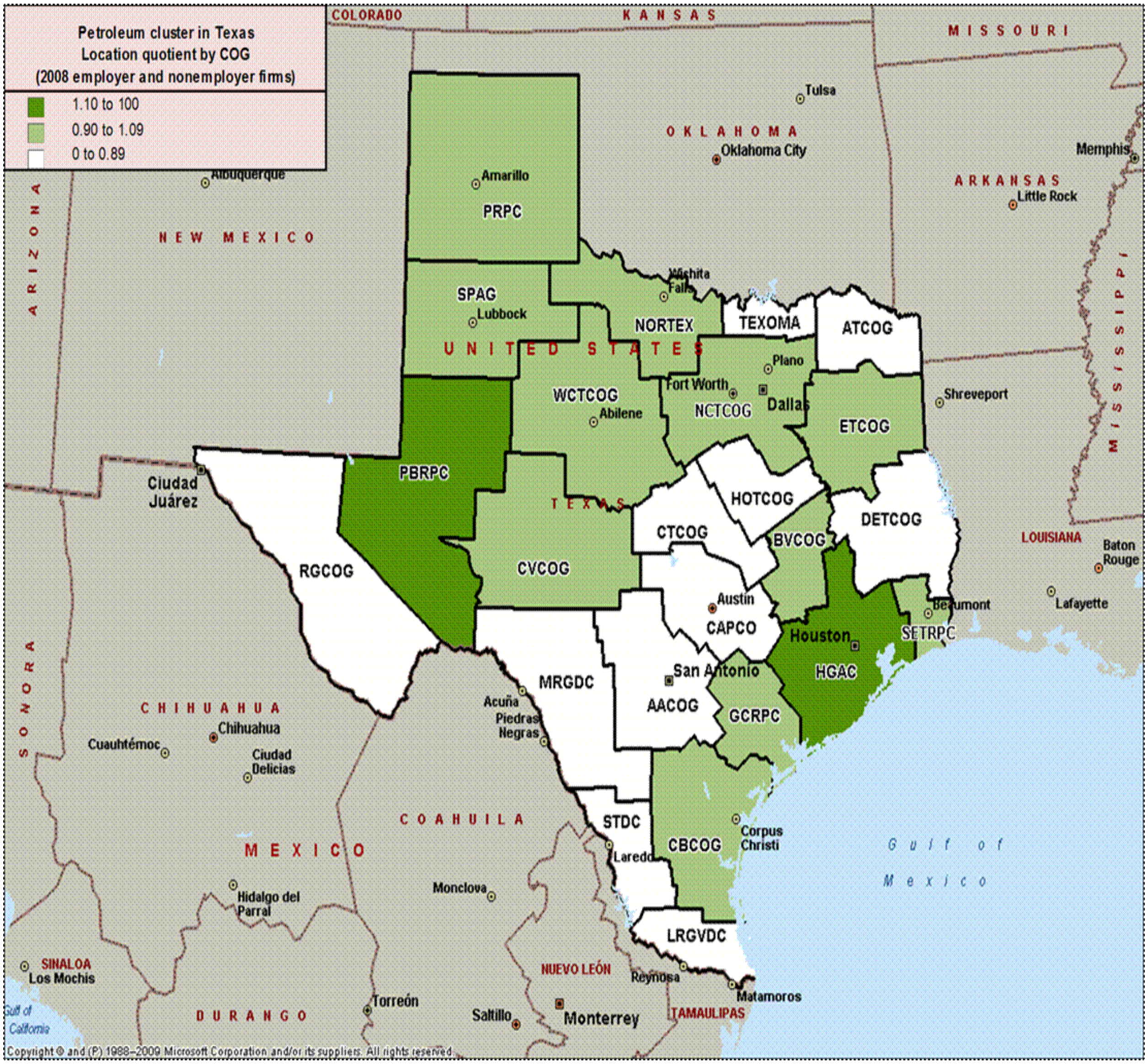
	Economic Impacts			
	Direct	Indirect	Induced	Total
Output	$104,932	$96,467	$26,602	$228,001
Employment	50,831	202,790	211,068	464,689
Value Added	$16,153	$52,226	$15,647	$84,026
Estimated State Revenue	$0	$0	$0	$2,894

Figure 1 maps the relative importance of the petroleum cluster among 24 Council of Governments (COG) areas.[i] To this end, the number of SBL100 firms for the cluster was divided by the total number of SBL100 firms in the respective COG area, excluding the government related firms. The same percentage was calculated at the state level. The ratio of the COG's percentage and the state's percentage represents a location quotient type of indicator where the number of firms replaces the number of jobs in the traditional calculation of location quotients.

The shades of the color green show the relative importance of the cluster: The darkest green shades represent above state average, and the white shades represent below state average. The light green shades represent same as state average.

Based on the location quotients, the map shows two COGs as having the importance of the petroleum cluster as above the state average: the Permian Basin Regional Planning Council (PBRPC) and the Houston-Galveston Area Council (HGAC).

Figure 1



*For presentation purposes Starr County was added to the LRGVDC.

Biotechnology and Life Sciences Cluster

Table 22 summarizes the impacts of SBL100 employer firms in the biotechnology and life sciences cluster. It is the largest employer of the group, and it is second in all categories of impacts. In this case, the employment induced effect is relatively large as a result of spending by households direct and indirectly related to the cluster. Some of the industries included in this cluster are: animal aquaculture, support activities for forestry, basic organic chemical manufacturing, pharmaceutical and medicine manufacturing, management and technical consulting services, market research and other professional services, among others.

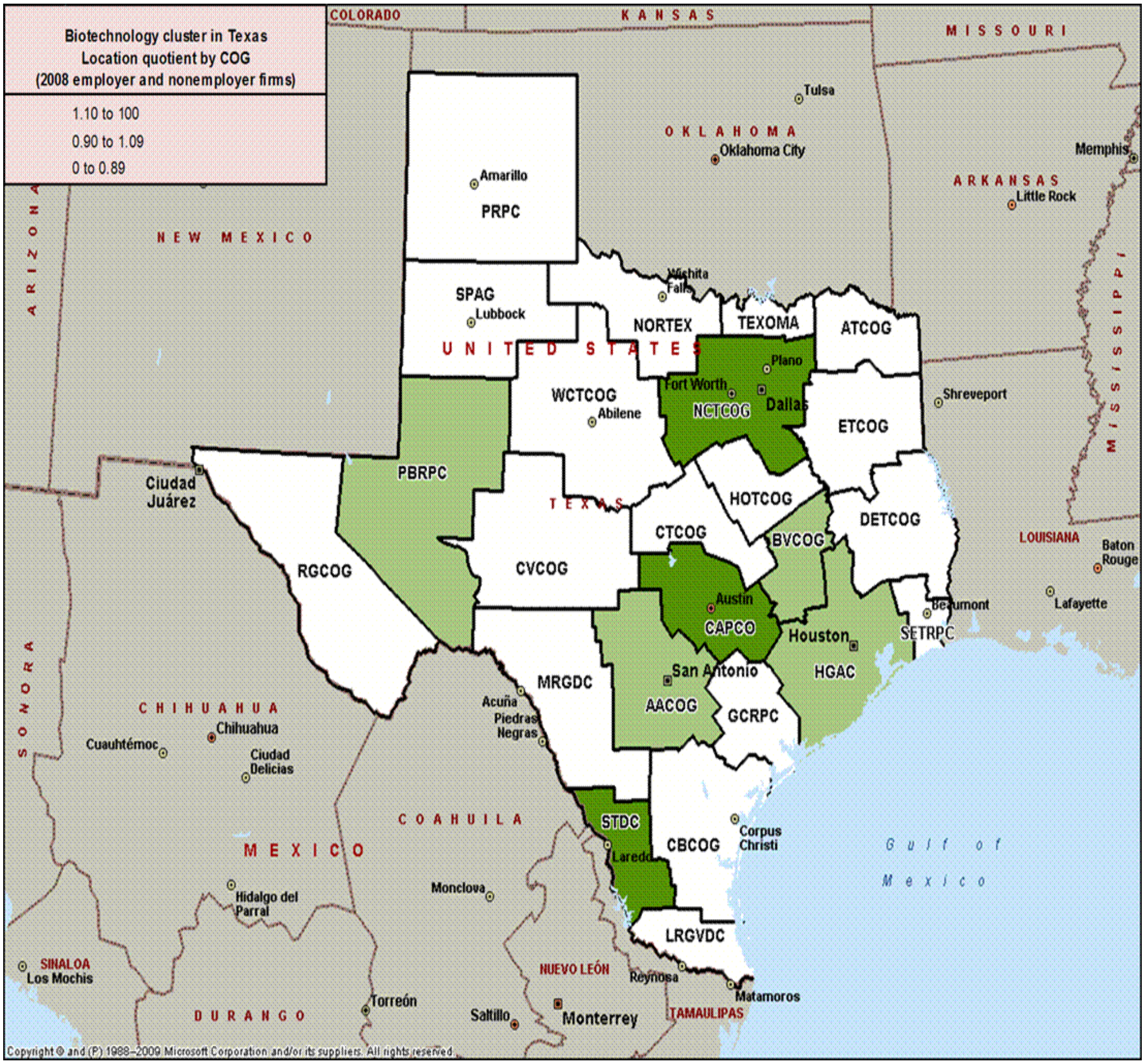
Table 22

Estimated Impact for Biotechnology and Life Sciences Cluster (2006)
(millions of dollars)

	Economic Impacts			
	Direct	Indirect	Induced	Total
Output	$42,872	$19,642	$16,469	$78,984
Employment	147,862	89,147	130,669	367,678
Value Added	$21,484	$9,417	$9,687	$40,588
Estimated State Revenue	$0	$0	$0	$1,246

Figure 2 maps the relative importance of the biotechnology cluster. Based on the location quotients, the map shows three COGs as having the importance of the biotechnology cluster above the state average: the North Central Texas Council of Governments (NCTCOG), the Capital Area Planning Council (CAPCO), and the South Texas Development Council (STDC).

Figure 2



*For presentation purposes Starr County was added to the LRGVDC.

Energy Cluster

Table 23 exhibits the impacts of the SBL100 employer firms in the energy cluster. This cluster includes three sub-clusters: oil and gas production, power generation and transmission, and manufactured energy systems. Some industries in this cluster are: oil and natural gas extraction, natural gas distribution, utility and communications system construction, power generators and electrical equipment manufacturing, among others.

Table 23

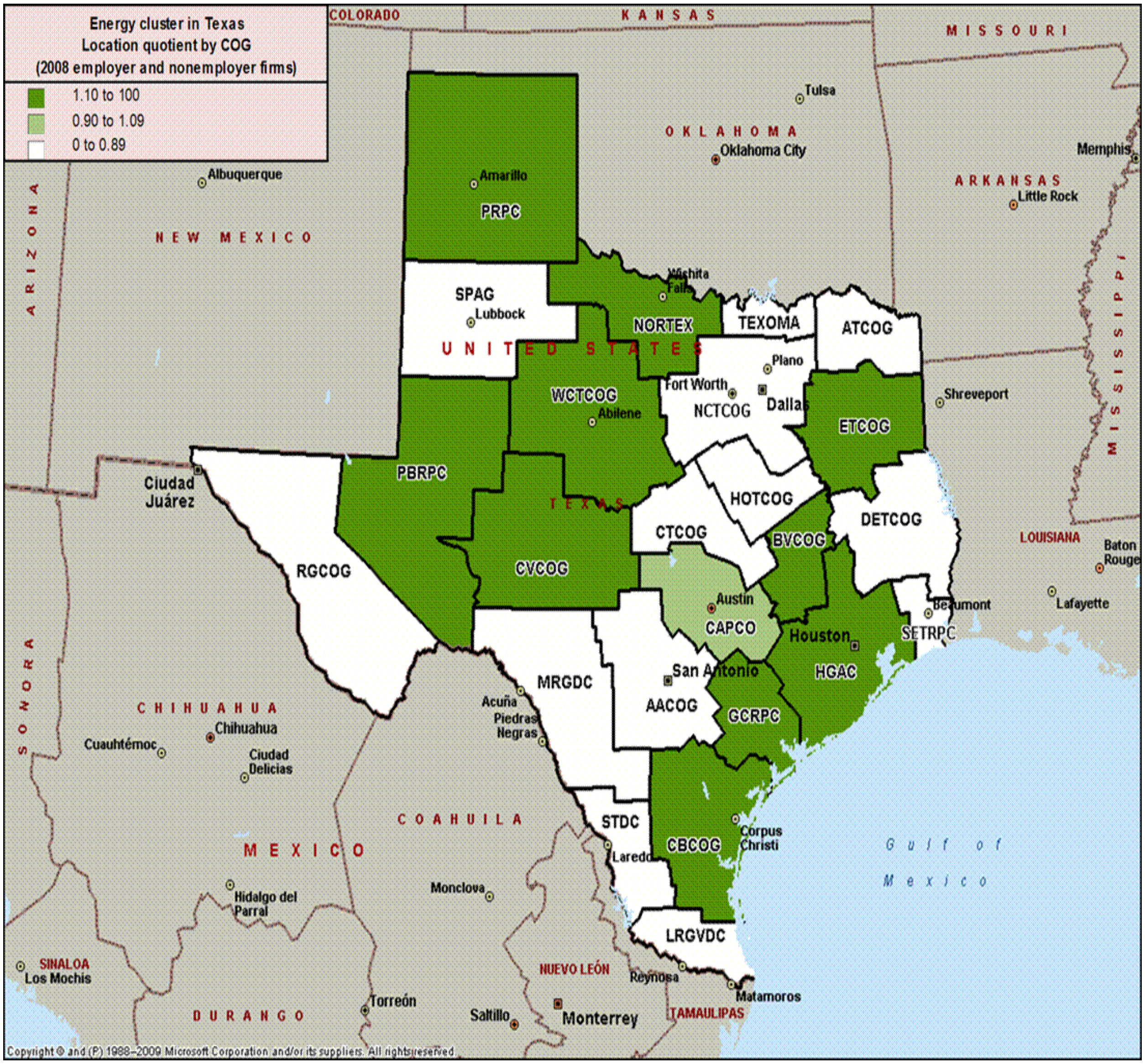
Estimated Impact for Energy Cluster (2006)

(millions of dollars)

	Economic Impacts			
	Direct	Indirect	Induced	Total
Output	$29,433	$9,498	$10,420	$49,352
Employment	131,596	41,518	82,679	255,793
Value Added	$18,195	$5,093	$6,129	$29,417
Estimated State Revenue	$0	$0	$0	$1,193

Figure 3 maps the relative importance of the energy cluster. Based on the location quotients, the map shows that most of the COGs located in the western and eastern parts of the state have the energy cluster as relatively more important than at the state level. On the other hand, most of the central COGs with the exception of the Capital Area Planning Council (CAPCO) show the cluster as relatively less important than at the state level.

Figure 3



*For presentation purposes Starr County was added to the LRGVDC.

Information and Computer Technology Cluster

Table 24 summarizes the impacts of SBL100 employer firms in the information and computer technology. This cluster includes three sub-clusters: Communications equipment, computing equipment and semiconductors, and information technology. It shows relatively large indirect and induced effect in employment and value added. Large indirect effects indicate strong ties to the regional economy. Some industries included in this cluster are: industrial machinery manufacturing, communications equipment manufacturing, electronic instrument manufacturing, semiconductor and electronic components manufacturing, wireless communications carriers, data processing and related services, colleges and universities, technical and trade schools, among others.

Table 24

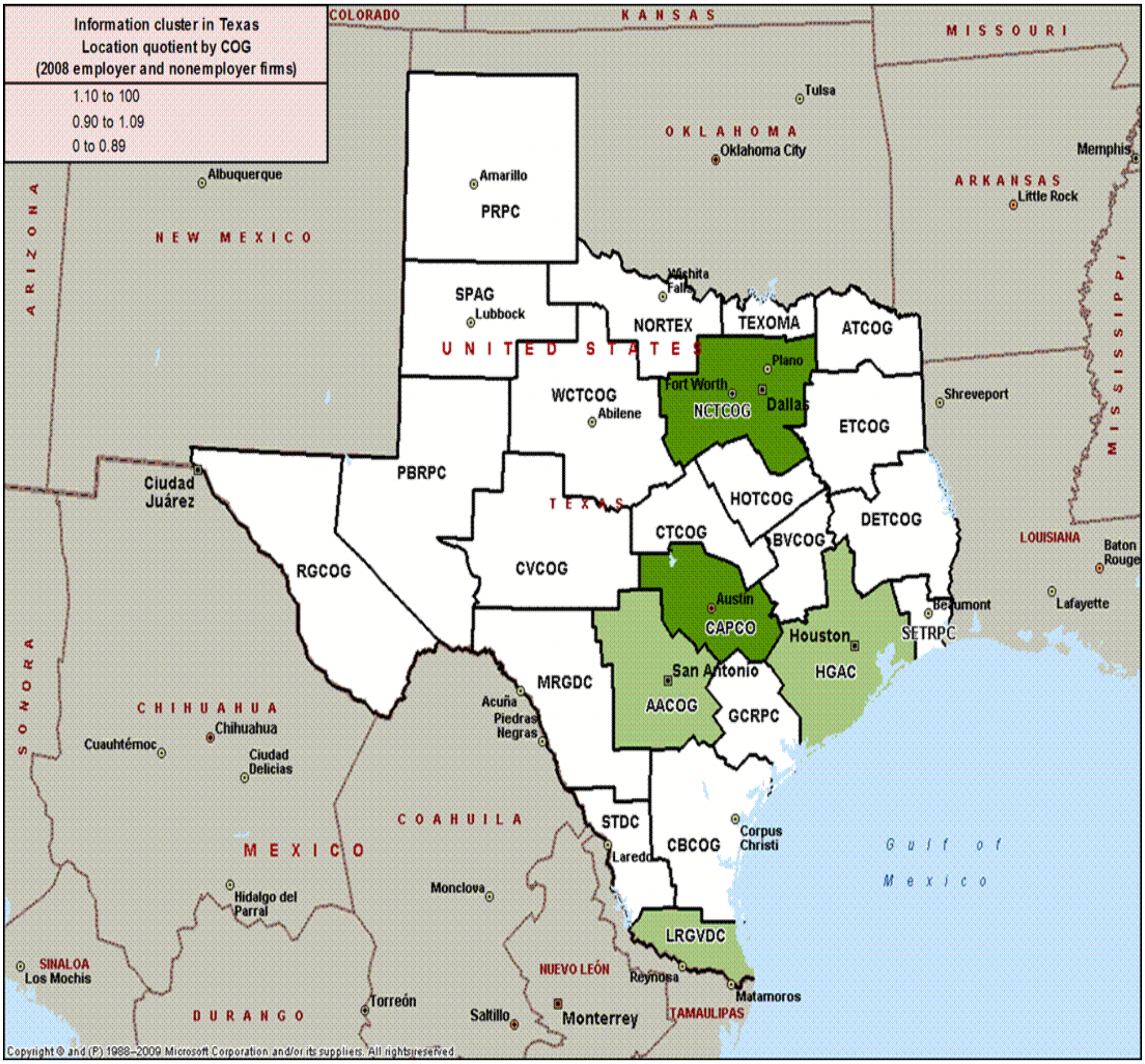
Estimated Impact for the Information and Computer Technology Cluster (2006)

(millions of dollars)

	Economic Impacts			
	Direct	Indirect	Induced	Total
Output	$34,436	$16,209	$10,437	$61,081
Employment	103,099	92,367	82,808	278,274
Value Added	$11,022	$8,048	$6,139	$25,209
Estimated State Revenue	$0	$0	$0	$654

Figure 4 maps the relative importance of the information. Based on the location quotients, the map shows two COGs as having the importance of the information cluster above the state average: the Capital Area Planning Council (CAPCO) and the North Central Texas Council of Governments (NCTCOG). It is also interesting that the Lower Rio Grande Valley Development Council (LRGVDC) together with other two COGs show as having the cluster as important as at the state level.

Figure 4



*For presentation purposes Starr County was added to the LRGVDC.

Advanced Technologies and Manufacturing Cluster

Table 25 exhibits the impacts of SBL100 employer firms in the advanced technologies and manufacturing cluster. The cluster includes four sub-clusters: Nanotechnology and materials, micro-electromechanical systems, semiconductor manufacturing, and automotive manufacturing. Direct employment in this cluster is the second largest in the group. Some industries in this group are: basic organic chemical manufacturing, commercial and service industry machinery, computers and peripheral equipment manufacturing, power generators and electrical equipment manufacturing, motor vehicle parts manufacturing, ship and boat building, medical and dental equipment manufacturing, among others.

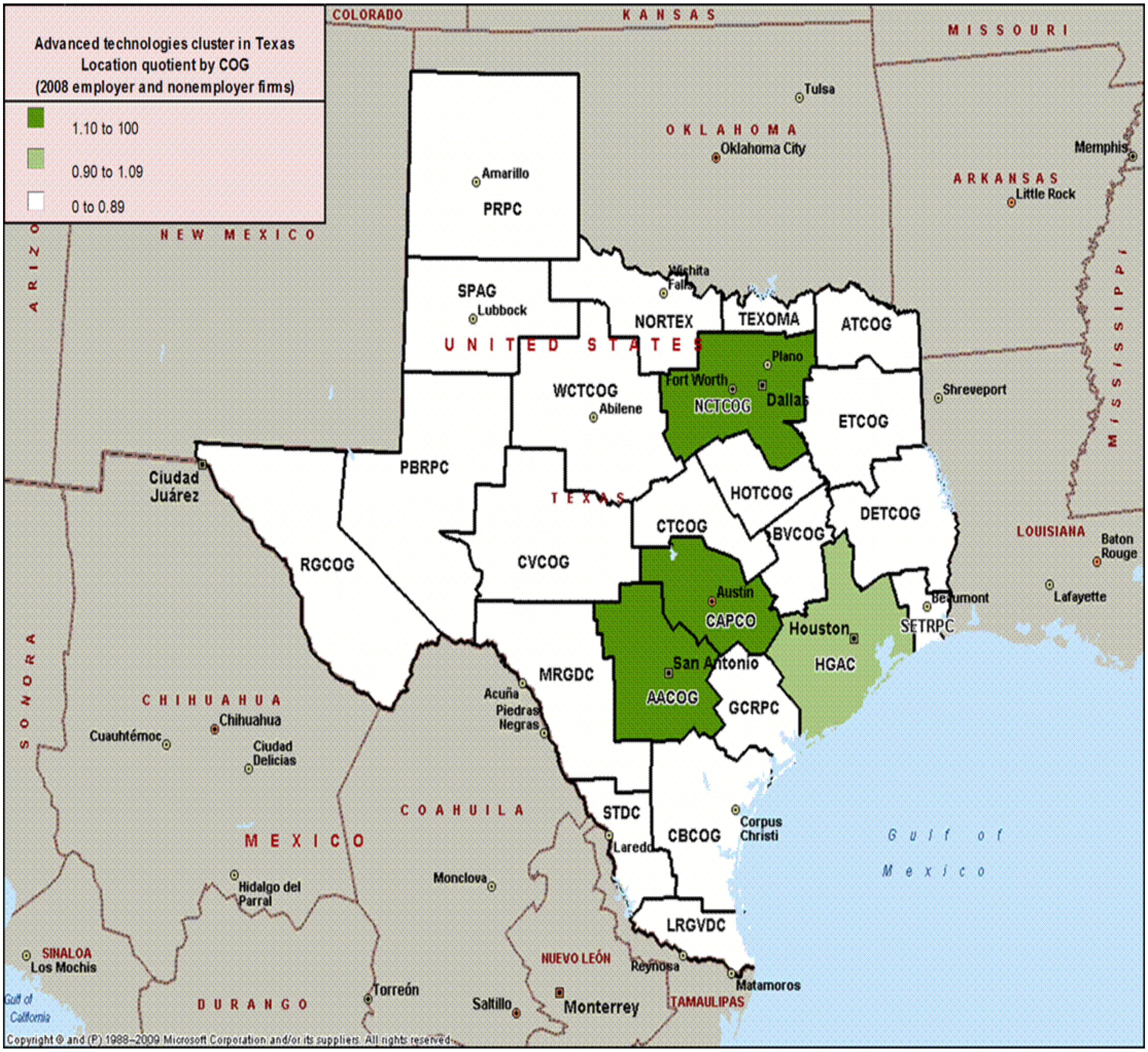
Table 25

Estimated Impact for Advanced Technologies and Manufacturing Cluster (2006)
(millions of dollars)

	Economic Impacts			
	Direct	Indirect	Induced	Total
Output	$31,531	$12,887	$9,821	$54,239
Employment	141,367	66,768	77,927	286,062
Value Added	$12,859	$6,552	$5,777	$25,188
Estimated State Revenue	$0	$0	$0	$608

Figure 5 maps the relative importance of the advanced technologies. Based on the location quotients, the map shows three COGs as having the importance of the advanced technologies cluster above the state average: the North Central Texas Council of Governments (NCTCOG), the Capital Area Planning Council (CAPCO), and the Alamo Area Council of Governments (AACOG).

Figure 5



*For presentation purposes Starr County was added to the LRGVDC.

Aerospace and Defense Cluster

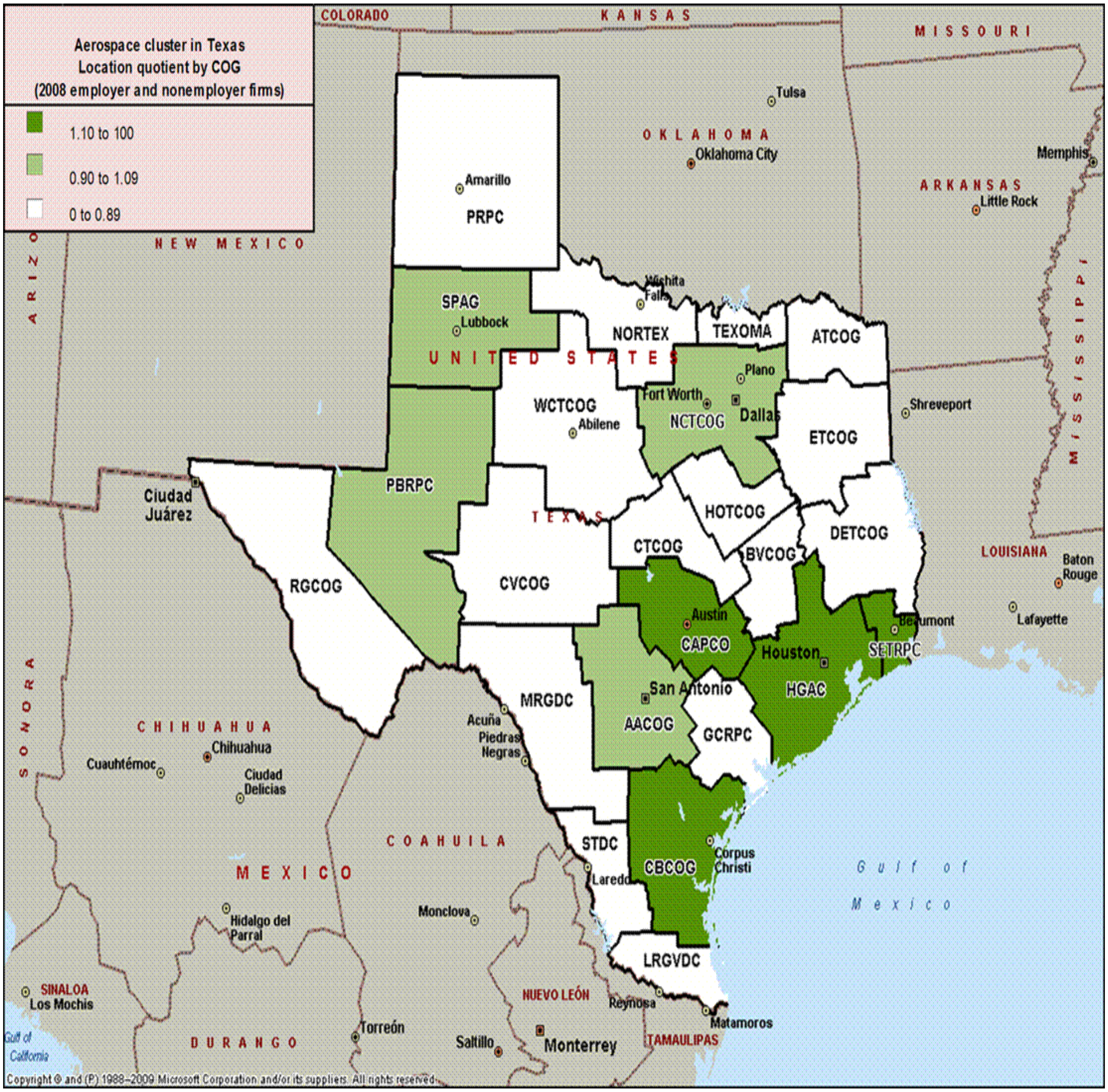
Table 26 summarizes the results of the aerospace and defense cluster for SBL100 employer firms. It also shows relatively large indirect and induced effects in employment and, in a lesser way, in value added. Included in this cluster are the following industries: electronic instrument manufacturing; guided missiles, aerospace product and parts manufacturing; airport operations, air traffic control and related; port and harbor operations and navigation services, among others.

Table 26

Estimated Impact for Aerospace and Defense Cluster (2006) (millions of dollars)				
	Economic Impacts			
	Direct	Indirect	Induced	Total
Output	$7,470	$2,928	$2,301	$12,698
Employment	21,996	16,402	18,254	56,653
Value Added	$3,256	$1,537	$1,353	$6,146
Estimated State Revenue	$0	$0	$0	$144

Figure 6 maps the relative importance of the aerospace cluster. Based on the location quotients, the map shows four COGs as having the importance of the aerospace cluster above the state average: the Coastal Bend Council of Governments (CBCOG), the South East Texas Regional Planning Commission (SETRPC), the Capital Area Planning Council (CAPCO), and the Houston-Galveston Area Council (HGAC).

Figure 6



*For presentation purposes Starr County was added to the LRGVDC.

APPENDIX A. BEA and IMPLAN state data

BEA: Texas Private Sector Employment by industry, 2006	Jobs
Forestry, fishing, related activities, and other	66,334
Mining	283,397
Utilities	47,640
Construction	947,460
Manufacturing	980,290
Wholesale trade	555,521
Retail Trade	1,450,206
Transportation and warehousing	503,799
Information	262,935
Finance and insurance	673,278
Real estate and rental and leasing	564,671
Professional and technical services	856,068
Management of companies and enterprises	75,707
Administrative and waste services	900,649
Educational services	185,264
Health care and social assistance	1,215,018
Arts, entertainment, and recreation	210,889
Accommodation and food services	916,878
Other services, except public administration	782,330
Private employment	11,478,334

BEA: Texas Private Sector Value Added or Gross State Product by industry, 2006	Millions of dollars
Agriculture, forestry, fishing, and hunting	7,376
Mining	104,409
Utilities	37,457
Construction	56,004
Manufacturing	145,871
Wholesale trade	68,996
Retail trade	67,668
Transportation and warehousing, excluding Postal Service	37,068
Information	40,638
Finance and insurance	61,559
Real estate and rental and leasing	93,300
Professional and technical services	68,564
Management of companies and enterprises	14,768
Administrative and waste services	32,012
Educational services	5,534
Health care and social assistance	60,698
Arts, entertainment, and recreation	6,513
Accommodation and food services	25,972
Other services, except government	22,386
Total	956,793

IMPLAN: TEXAS OUTPUT, EMPLOYMENT AND VALUE ADDED FOR 2006

NAICS	Sector	Output (millions of dollars)	Employment	Value Added (millions of dollars)
11	Ag, Forestry, Fish & Hunting	$20,975	319,937	$6,805
21	Mining	$177,790	266,580	$111,358
22	Utilities	$52,251	48,589	$39,438
23	Construction	$116,005	950,998	$52,775
31-33	Manufacturing	$726,191	963,556	$147,014
42	Wholesale Trade	$106,912	545,800	$72,100
48-49	Transportation & Warehousing	$82,373	547,530	$43,521
44-45	Retail trade	$97,121	1,413,085	$63,994
51	Information	$90,919	258,447	$43,990
52	Finance & insurance	$124,461	643,814	$70,294
53	Real estate & rental	$125,705	525,373	$80,776
54	Professional- scientific & tech svcs	$117,688	866,850	$68,115
55	Management of companies	$13,275	73,048	$7,547
56	Administrative & waste services	$54,265	883,707	$33,535
61	Educational svcs	$9,810	182,040	$5,772
62	Health & social services	$99,043	1,186,226	$61,876
71	Arts- entertainment & recreation	$10,067	201,312	$6,086
72	Accomodation & food services	$49,521	897,793	$25,222
81	Other services	$40,835	754,862	$21,352
		$2,115,205	11,529,547	$961,570

Source: IMPLAN 2006 data

APENDIX B. Clusters: small business versus all firms

IMPACTS OF SMALL FIRMS WITH LESS THAN 100 EMPLOYEES IN TEXAS CLUSTERS (CORE ACTIVITIES) IN 2006 (millions of dollars)				
Cluster	Direct employment	Direct Value Added	Direct output	State Revenues
Advanced Tech	141,367	12,859	31,531	608
Aerospace	21,996	3,256	7,470	144
Biotechnology	147,862	21,484	42,872	1,246
Energy	131,596	18,195	29,433	1,193
Information	103,099	11,022	34,436	654
Petroleum	50,831	16,153	104,932	2,894

TEXAS CLUSTERS (CORE ACTIVITIES) IN 2006 (millions of dollars)				
Cluster	Direct employment	Direct Value Added	Direct output	State Revenues
Advanced Tech	514,444	$52,101	$148,467	$2,907
Aerospace	144,771	$18,580	$42,930	$787
Biotechnology	385,261	$56,683	$129,880	$3,453
Energy	393,369	$64,481	$104,985	$4,691
Information	460,200	$52,346	$162,332	$2,951
Petroleum	240,558	$76,511	$483,111	$13,282

APPENDIX C. Definitions of Clusters by NAICS industries

All industries listed here correspond to the *core* definition of a cluster in Texas. A cluster has several supporting industries according to the Governor's office. The industries included in one cluster can be included in another cluster, these definitions are not exclusive of each other.

Advanced Technologies and Manufacturing	
NAICS	**NAICS Title**
3251	Basic Organic Chemical Manufacturing
3252	Resin, Rubber, and Synthetic Fibers
3255	Paint, Coating, & Adhesive Manufacturing
3331	Ag., Construction, and Mining Machinery Mfg
3332	Industrial Machinery Manufacturing
3333	Commercial & Service Industry Machinery
3336	Turbine & Power Transmission Equipment Mfg
3339	Other General Purpose Machinery Manufacturing
3341	Computers and Peripheral Equipment Mfg
3342	Communications Equipment Manufacturing
3343	Audio and Video Equipment Manufacturing
3344	Semiconductor & Electronic Components Mfg
3345	Electronic Instrument Manufacturing
3346	Magnetic Media & Reproducing Manufacturing
3353	Power Generators & Electrical Equipment Mfg
3359	Batteries, Fiber Optic Cable & Misc Electrical Mfg
3361	Automobile, Light & Heavy Duty Truck Manufacturing
3362	Motor Vehicle Body and Travel Trailer Manufacturing
3363	Motor Vehicle Parts Manufacturing
3364	Guided Missles, Aerospace Product & Parts Mfg
3365	Railroad Rolling Stock Manufacturing
3366	Ship and Boat Building
3369	Bike, Motorcycle & Misc. Transport Manufacturing
3391	Medical and Dental Equipment Mfg
5413	Architectural, Engineering, Testing Lab Services
5414	Interior, Industrial & Specialized Design Services
5415	Computer Systems Design and Related Services

Aerospace and Defense	
NAICS	**NAICS Title**
3333	Commercial & Service Industry Machinery
3345	Electronic Instrument Manufacturing
3361	Automobile, Light & Heavy Duty Truck Manufacturing
3364	Guided Missles, Aerospace Product & Parts Mfg
3366	Ship and Boat Building
3369	Bike, Motorcycle & Misc. Transport Manufacturing
4881	Airport Operations, Air Traffic Control & Related
4883	Port & Harbor Operations & Navigation Services
5417	Scientific Research and Development Services
9190	Federal Govt

Biotechnology and Life Sciences	
NAICS	**NAICS Title**
1125	Animal Aquaculture
1151	Farm Management Services
1152	Support Activities for Animal Production
1153	Support Activities for Forestry
3251	Basic Organic Chemical Manufacturing
3252	Resin, Rubber, and Synthetic Fibers
3253	Pesticide & Agricultural Chemical Mfg.
3254	Pharmaceutical & Medicine Manufacturing
3345	Electronic Instrument Manufacturing
3391	Medical and Dental Equipment Mfg
5413	Architectural, Engineering, Testing Lab Services
5416	Management & Technical Consulting Services
5417	Scientific Research and Development Services
5419	Market Research & Other Professional Services
6215	Medical, Diagnostic Laboratories & Imaging Centers

Energy	
NAICS	**NAICS Title**
2111	Oil and Natural Gas Extraction
2121	Anthracite Coal Mining
2131	Oil Well Drilling & Support Activities for Mining
2211	Electric Power Generation and Supply
2212	Natural Gas Distribution
2371	Utility/Communications System Construction
2379	Other Heavy Construction
3336	Turbine & Power Transmission Equipment Mfg
3353	Power Generators & Electrical Equipment Mfg
4861	Pipeline Transportation of Crude Oil
4862	Pipeline Transportation of Natural Gas
5413	Architectural, Engineering, Testing Lab Services

Information and Computer Technology	
NAICS	**NAICS Title**
3332	Industrial Machinery Manufacturing
3333	Commercial & Service Industry Machinery
3341	Computers and Peripheral Equipment Mfg
3342	Communications Equipment Manufacturing
3343	Audio and Video Equipment Manufacturing
3344	Semiconductor & Electronic Components Mfg
3345	Electronic Instrument Manufacturing
3346	Magnetic Media & Reproducing Manufacturing
3359	Batteries, Fiber Optic Cable & Misc Electrical Mfg
4234	Computer, Office & Other Commercial Equip Merchants
4431	Electronics, Camera and Appliance Stores
5112	Software Publishers
5152	Cable and Other Subscription Programming
5161	Internet Publishing and Broadcasting
5172	Wireless Telecommunications Carriers
5181	ISPs and Web Search Portals
5182	Data Processing and Related Services
5414	Interior, Industrial & Specialized Design Services
5415	Computer Systems Design and Related Services
6113	Colleges and Universities
6114	Business, Computer & Management Training
6115	Technical and Trade Schools

Petroleum Refining and Chemical Products	
NAICS	**NAICS Title**
3241	Petroleum & Coal Products Manufacturing
3251	Basic Organic Chemical Manufacturing
3252	Resin, Rubber, and Synthetic Fibers
3253	Pesticide & Agricultural Chemical Mfg.
3256	Cleaning Compound and Toiletry Manufacturing
3259	Other Chemical Preparation Manufacturing
3261	Misc. Plastics Product Manufacturing
3262	Tires, Tubes & Misc. Rubber Manufacturing
3331	Ag., Construction, and Mining Machinery Mfg
3332	Industrial Machinery Manufacturing
3345	Electronic Instrument Manufacturing
4246	Chemical Merchant Wholesalers
4247	Petroleum Merchant Wholesalers
4861	Pipeline Transportation of Crude Oil
4862	Pipeline Transportation of Natural Gas
4869	Other Pipeline Transportation
5239	Investment, Portfolio and Misc. Financial Services
9190	Federal Govt
9290	State Government

APPENDIX D. Council of Governments

COG's initials	COG title
AACOG	Alamo Area Council of Governments
ATCOG	Arkansas-Texas Council of Governments
BVCOG	Brazos Valley Council of Governments
CAPCO	Capital Area Planning Council
CBCOG	Coastal Bend Council of Governments
CTCOG	Central Texas Council of Governments
CVCOG	Concho Valley Council of Governments
DETCOG	Deep East Texas Council of Governments
ETCOG	East Texas Council of Governments
GCRPC	Golden Crescent Regional Planning Commission
HGAC	Houston-Galveston Area Council
HOTCOG	Heart of Texas Council of Governments
LRGVDC	Lower Rio Grande Valley Development Council
LRGVDC	Lower Rio Grande Valley Development Council
MRGDC	Middle Rio Grande Development Council
NCTCOG	North Central Texas Council of Governments
NORTEX	North Texas Regional Planning Commission
PBRPC	Permian Basin Regional Planning Commission
PRPC	Panhandle Regional Planning Commission
RGCOG	Rio Grande Council of Governments
SETRPC	South East Texas Regional Planning Commission
SPAG	South Plains Association of Governments
STDC	South Texas Development Council
STDC	South Texas Development Council
TEXOMA	Texoma Council of Governments
WCTCOG	West Central Texas Council of Governments

[i] Because these maps were produced with Reference USA information for Workforce Development Areas (WDAs), it was not possible to isolate the effects of the Lower Rio Grande Valley Development Council (LRGVDC) from the Starr county, and therefore the county was included in the LRGVDC area. See Appendix D for a list of COGs.