The fields driving economic growth in the Golden Triangle 2009-2014

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ABSTRACT

This paper is the third of a series of articles on the fields driving economic growth in Golden Triangle of Texas, spanning three five-year periods from 1997 to 2014: (1) 1997-2002, (2) 2003-2008, and (3) 2009-2014. Like the previous two series, this article analyzed which sectors (NAICS 3-digit codes) are drivers of the economic growth in Golden Triangle by virtue of the fact that they increased over the five-year time frame while also involved in exporting. These sectors generated new income and jobs to the Southeast Texas area, with larger multiplier effects. Analysis using location quotient and shift-share were utilized on the data available from the Texas Workforce Commission (TWC). The results showed which industries: (1) persisted as the main employers in the Southeast Texas area, (2) reduced as employees to the more competitive sectors, (3) remained as drivers of economic growth in the Southeast Texas area, or (4) have been supplanted by new drivers of economic growth that clearly indicated having comparative advantages. Lastly, the implications on both policy and research are obtained for planning of economic development in the Golden Triangle of Southeast Texas.

Keywords: shift-share analysis, comparative advantage, location quotient, exporting and importing industries

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This paper is a sequel to the 2003-2008 study that re-examined the drivers of economic growth in the Golden Triangle of Southeast Texas (Montano, et al., 2014). It similarly focuses on the Southeast Texas region commonly known as "The Golden Triangle" or technically, the Beaumont-Port Arthur Metropolitan Statistical Area (MSA). The five-year time frame of this study (2009-2014) picks up the next five-year time frame from 2009-2014.

Study Goals

Our goals in this study new five-year time frame were: (1) To conclude which sectors continued to be the main employers in the Golden Triangle area of Southeast Texas; and which old/new sectors replaced them as employment drivers; (2) To establish which of the past main employers increased and which decreased, along with which sectors grew and replaced the sectors that declined; (3) Shift-share analysis was used to conclude which Golden Triangle's employers/sectors had a comparative advantage; (4) Location quotients was used to identify the importing and exporting sectors; and (5) Establish the sectors that are the drivers of economic growth of the Southeast Texas due to their exporting and expanding industries.

Golden Triangle Region

The geographical scope of this sequel maintained the traditional definition of the Southeast Texas Region as composed of Jefferson, Hardin, and Orange Counties of Texas, otherwise technically known as the Beaumont-Port Arthur MSA. Our three-fold reasons were: (1) Economic development planning often involves the local Chamber of Commerce for a regional area; (2) At the MSA level, data on employment is available and easily accessible but not always at other multi-county aggregation levels; and (3) Shift-share and location quotient analyses are provided for used by the government statistical agencies supplying the data for MSAs.

Data

Labor market and Career Information Department and the Texas Workforce Commission (TWC) was used to obtain the employment data for each NAICS 3-digit code. The 1st Quarter 2009 to 1st Quarter 2014 was the five-year time frame for this study. The North American Industrial Classification (NAICS 3-didgit code) for QCEW (Quarterly Employment and Wages) was collected for the twenty quarters. The Government (Public Sectors) was included in this study as the authors to see if projects by local government such as the Ford Park (originaly named the Jefferson County Entertainment Complex) and Correctional Complexes by both State of Texas and Federal contributed to the diversification of employment numbers in the Golden Triangle.

Analyses

The shift-share analysis of the Golden Triangle area of Southeast Texas (MSA for Beaumont-Port Arthur) over the 2009-2014 period was possible using the online Standardized Occupational Components for Research and Analysis of Trends in Employment System (SOCRATES) online software system of the Texas Employment Commission (TEC) and Career Development Resources (CDR). Results was generated that provided the Analysis Narrative and Shift Share tables using the shift share analysis.

The Bureau of Labor Statistics' Location Quotient Calculator generated the location quotients for the sectors used in this study. The software and the QCEW statistical series is provided.

FINDINGS

Top Employers in Southeast Texas 2009 and 2014

Top Private Sector employers in 2009 and 2014, with more than 4,000 employees each, are presented in Tables 1. As will be noted in Table 3 below, most of these industries consistently appeared to be the mainstay of employment in the Golden Triangle throughout the fifteen years (1997-2014) of this study.

Table 1. Largest Employers in Golden Triangle		2009	2014
NAICS 3-Digit Code	Industry	Bmt-PA MSA	Bmt-PA MSA
722	Food services and drinking places	12,679	12,609
621	Ambulatory health care services	10,462	10,090
236	Construction of buildings	7,873	7,223
238	Specialty trade contractors	7,545	6,511
541	Professional and technical services	6,804	6,329
561	Administrative and support services	5,714	5,346
622	Hospitals	5,682	5,227
325	Chemical manufacturing	5,249	4,899
452	General merchandise stores	5,187	4,834
324	Coal and petroleum products manufacturing	4,683	4,534

Meanwhile, to gain insight into the Public Sector contribution to employment, broken down by Federal, State, and Local levels, Tables 2 are presented for 2009 and 2014.

These Government-owned industries are arranged in descending order of employment. When a cut-off is made at 4,000 employees, similar to what was done in the Private Sector, and industries were combined by NAICS code, regardless of Level of Government, only two industries came out as top employers in Southeast Texas: (1) Educational Services (NAICS Code 611) and (2) Justice, Public Order, and Safety Activities (NAICS Code 922). Clearly, these two industries in the Public Sector significantly contributed towards diversifying the employment base of the Golden Triangle.

Table 2. Employment by Public Sector			2009	2014
Government Level	NAICS 3-Digit Code	Industry	Bmt-PA MSA	Bmt-PA MSA
Local	611	Educational services	12,026	11,533
State	611	Educational services	2,470	2,353
Local	922	Public order, justice and safety activities	2,219	2,277
State	922	Public order, justice and safety activities	1,853	0
Local	921	Legislative, executive and general government	1,483	1,448
Federal	922	Public order, justice and safety activities	989	1,080
Federal	491	Postal service	764	617
Local	221	Utilities	634	606
Local	237	Civil and heavy engineering construction	382	395
State	923	Administration of human resource programs	350	302
Local	924	Administration of environmental programs	212	213

Educational Services (NAICS Code 611) are provided by the local government through the independent school districts, e.g., Beaumont and Port Arthur Independent School Districts. Whereas, state-provided educational services cover higher education through Lamar University -- a member of the Texas State University System funded by the State of Texas --, Lamar Institute of Technology, and Lamar State Colleges in the cities of Port Arthur and Orange, all funded by the State of Texas, as well.

Public Order, Justice and Safety Activities (NAICS Code 922) include the local County jails, as well as State and Federal prisons along the Highway 69 corridor between Beaumont and Port Arthur (Collectively referred to as Correctional Complex, or fondly as “incarceration industry”.)

Further insights can be gained from Table 3 on how top employers prevailed over changing economic conditions across the time frame of this study (1997-2014). We identified

Table 3. Largest Employers in Golden Triangle, 1997-2014							
NAICS 3-Digit Code	Industry	1997	2002	2003	2008	2009	2014
236	Construction of buildings	*X*		*X*	*X*	*X*	
237	Civil and Heavy engineering construction		*X*	*X*			*X*
238	Specialty trade contractors	*X*	*X*		*X*	*X*	*X*
324	Coal and Petroleum products manufacturing	X	*X*	*X*	*X*	*X*	*X*
332	Fabricated metal product manufacturing	X			*X*		
325	Chemical manufacturing		*X*	*X*	*X*	*X*	*X*
445	Food and beverage stores	X	*X*				
452	General merchandise stores			X	*X*	*X*	*X*
541	Professional and technical services	X	*X*	*X*	*X*	*X*	*X*
561	Administrative and support services	X	*X*	*X*	*X*	*X*	*X*
611	Educational Services*			*X*	*X*	*X*	*X*
621	Ambulatory health care services	X	*X*	*X*	*X*	*X*	*X*
622	Hospitals	X	*X*	*X*	*X*	*X*	*X*
623	Residential and Nursing care facilities	X	*X*				
722	Food services and drinking places	X	*X*	*X*	*X*	*X*	*X*
922	Public Order, Justice and Safety Activities*			*X*	*X*	*X*	

*Public (or Government) Sector, included starting 2003

six (6) industries that were consistently top employers over this fifteen-year time period: (1) Petroleum and coal products manufacturing (NAICS Code 324), (2) Professional and technical services (NAICS Code 541), (3) Administrative and support services (NAICS Code 561), (4) Ambulatory health care services (NAICS Code 621), (5) Hospitals (NAICS Code 22), and (6) Food Services and drinking places (NAICS Code 722).

Other industries as top employers appeared off and on inconsistently. For example, Construction of Buildings (NAICS Code 236), General Merchandise Stores (NAICS Code 452), and Educational Services (NAICS Code 611, Public Sector) were among the top employers in 4 out of 6 years recorded on Table 3. Whereas, Heavy and Civil Engineering Construction (NAICS Code 237) and Public Order, Justice and Safety Activities (NAICS Code 922, Public Sector) appeared at the top only in 3 out of 6 times. Conceivably, the ebb and flow of business and employment both in the Private and Public Sectors are influenced by the business cycle -- notably recessions in 2001 and 2009 -- whereas Public Sectors are particularly vulnerable to changes in public policy (e.g., closures of schools and prisons due to budget problems). A reference to the latter phenomenon will be made in a later section regarding loss of jobs.

Top Expanding Industries in Southeast Texas 2009-2014

The top expanding and declining private-sector industries from 2009 to 2014, which lost or created over 200 jobs in their sector, are presented in Table 4. As in our previous report, alarmingly again, we noticed that some top employers in the Golden Triangle (Table 5) are among the heavy losers of jobs in 2009-2014, to wit: Construction of Buildings (NAICS Code 236), Fabricated Metal Products Manufacturing (NAICS Code 332), Hospitals (NAICS Code 622), Administrative and Support Services (NAICS Code 561), and Professional and Technical Services (NAICS Code 541).

Increase (Decrease) in Public Sector Employment in Southeast Texas 2009-20014

None of the two top employing public-sector industries presented in Tables 3 and 4 (NAICS Code 611 and NAICS Code 922) expanded during the 2009-2014 period. On the contrary, each lost more than 200 jobs during the 2009-2014 period (Table 8): - 610 for NAICS Code 611 (Educational Services) and a net loss of -1,704 (= -1,853 + 149) for NAICS Code 922 (Public order, justice and safety activities). These public-sector job losses could be the consequence of a policy response

Table 4. Top Expanding and Declining Industries in Southeast Texas, 2009-2014

NAICS 3-Digit Code	Industry	Q1 2009	Q1 2014	Increase or Decrease (-)
237	Civil and heavy engineering construction	3,228	4,534	1306
325	Chemical manufacturing	5,249	6,511	1262
525	Funds, trusts, and other financial vehicles	11	1,173	1162
811	Repair and maintenance	1,887	2,824	937
488	Support activities for transportation	1,457	1,958	501
551	Management of companies and enterprises	947	1,352	405
623	Residential and Nursing care facilities	3,014	3,356	342
333	Machinery manufacturing	1,615	1,949	334
485	Transit and ground passenger transportation	292	581	289
213	Support activities for mining	951	1,234	283
511	Publishing industries (except internet)	536	320	-216
444	Building material and garden supply stores	1,944	1,670	-274
238	Specialty trade contractors	7,545	7,223	-322
331	Primary metal manufacturing	996	652	-344
336	Transportation equipment manufacturing	1,519	1,147	-372
621	Ambulatory health care services	10,462	10,090	-372
322	Paper manufacturing	431	0	-431
562	Waste management and remediation services	1,095	642	-453
541	Professional and technical services	6,804	6,329	-475
561	Administrative and support services	5,714	5,227	-487

622	Hospitals	5,682	4,899	-783
332	Fabricated metal product manufacturing	3,974	3,183	-791
532	Rental and leasing services	1,049	14	-1035
236	Construction of buildings	7,873	3,603	-4270

to budget deficit, as in the case of layoffs in the Beaumont Independent School District (*The Examiner*, 2013 & 2015), or a means to efficiently consolidate statewide facilities, as in the August 31, 2011 closure of Al Price State Juvenile Correctional facility in Jefferson County which had 270 employees (*Wikipedia*, 2016).

Shift-Share Analyses of Southeast Texas, 2009-2014

The shift-share analysis of Southeast Texas over the five-year period (2009-2014) was analyzed. Not surprisingly, the top employers who were the worst job losers are not found among those with "Greatest Likelihood for Potential Job Opportunities". Evidently, these industries have been losing their comparative advantages in the area. Among these is Hospitals (NAICS Code 622), which has been declining or losing jobs since the 1997-2002 period of this study (Montano, et al., 2014, p. 6).

Table 5. Increase (Decrease) in Public Sector Employment in Southeast Texas, 2009-2014

Government Level	NAICS 3-Digit Code	Industry	Bmt-PA MSA		
			2009 Q1	2014 Q1	Increase or Decrease (-)
Local	611	Educational services	12,026	11,533	-493
State	611	Educational services	2,470	2,353	-117
Local	922	Public order, justice and safety activities	2,219	2,277	58
State	922	Public order, justice and safety activities	1,853	0	-1,853
Local	921	Legislative executive and general government	1,483	1,448	-35
Federal	922	Public order, justice and safety activities	989	1,080	91
Federal	491	Postal service	764	617	-147
Local	221	Utilities	634	606	-28
Local	237	Civil and heavy engineering construction	382	395	13
State	923	Administration of human resource programs	350	302	-48
Local	924	Administration of environmental programs	212	213	1

The Engine of Economic Growth in Southeast Texas, 2009-2014

The engine of economic growth in Southeast Texas during the 2009-2014 period are those expanding industries in Table 6 that have also been determined to be exporting industries, each with a Location Quotient (LQ) of greater than 1.25 (Table 6). These are the industries that bring in new money/income and jobs to the Golden Triangle. Their multiplier effects are potentially larger than non-exporting industries.

Like in the earlier section about top employers in the region (Table 3), we were equally curious how the combinations of industries that constituted "the engine of economic growth of Southeast Texas" have changed over the fifteen-year (1997-2014) span of the study. Insightfully, we found one industry that consistently prevailed to be at the core of that engine: Civil and heavy engineering construction (NAICS 237) (Table 7). Why that is remains to be researched and explained.

Table 6. The Drivers of Economic Growth in the Golden Triangle, 2009-2014

NAICS 3-Digit Code	Industry	Increase in Employment	Exporting Industries (LQ>1.25)
237	Civil and heavy engineering construction	1306	2.86
325	Chemical manufacturing	1262	5.35
811	Repair and maintenance	937	1.34
488	Support activities for transportation	501	2.68
333	Machinery manufacturing	334	1.64
213	Support activities for mining	283	2.62

Table 7. The Drivers of Economic Growth in the Golden Triangle, 1997-2014

NAICS 3-Digit Code	Industry	1997-2002*	2003-2008	2009-2014
211	Oil and gas extraction		*X*	
213	Support activities for mining		*X*	*X*
236	Construction of buildings	*X*	*X*	
237	Civil and Heavy engineering construction	*X*	*X*	*X*
238	Specialty trade contractors		*X*	
324	Coal and petroleum products manufacturing		*X*	
325	Chemical manufacturing			*X*
331	Primary metal manufacturing		*X*	
332	Fabricated metal product manufacturing	*X*	*X*	
333	Machinery manufacturing			*X*
452	General merchandise stores		*X*	
486	Pipeline transportation		*X*	
488	Support activities for transportation		*X*	*X*
562	Waste management and remediation service	*X*	*X*	
621	Ambulatory health care services	*X*	*X*	
811	Repair and maintenance			*X*

Conclusions and Policy/Research Implications

Throughout the three five-year periods (or 15 years) of this study (from 1997 to 2014), sixteen (16) industries comprised the top employers of Southeast Texas, each employing more than 4,000 workers. Two (2) of these belong to the Public Sector – meaning they are composed of government-owned enterprises, whether at the local, state, or federal levels: Educational Services (NAICS Code 611), and Public Order, Justice and Safety Activities (NAICS Code 922). Six (6) of the 16 total consistently served as top employers of the region (including the current period of this study, 2009-2014), while the others appeared so off and on, namely: (1) NAICS Code 324 (Coal and petroleum products manufacturing), (2) NAICS Code 541 (Professional and technical services), (3) NAICS Code 561 (Administrative and support services), (4) NAICS Code 621 (Ambulatory health care services), (5) NAICS Code 622 (Hospitals), and (6) NAICS Code 722 (Food services and drinking places).

Unfortunately, top employers are not necessarily top expanding industries. Some are worst declining or job losing industries in 2009-2014. For example: Construction of buildings (NAICS Code 236) lost 4,270 jobs, Fabricated metal product manufacturing (NAICS Code 332) lost 791 jobs, Hospitals (NAICS Code 622) lost 783 jobs, and Administrative and support services (NAICS Code 561) lost 487 jobs.

It follows also that not all top employers end up to be the engines of economic growth of the region. In fact, it was alarming to note that big job losers like Hospitals (NAICS Code 622) appear to lose comparative advantage in the region, as revealed in the shift-share analysis. Further research is needed to look into this alarming trend. One can argue theoretically that if the loss of jobs (or layoffs) leads to an increase in labor productivity, the enterprises/industries affected ought to become more competitive – because an increase in labor productivity lowers per unit cost of production. But it looks like this is not exactly what is happening. Thus, micro-type or firm-level research seems to be called for in this regard.

Expanding industries that have also been determined to be exporting industries are the engines of economic growth. Only six (6) of these types of industries were found in Southeast Texas in 2009-2014, namely: (1) NAICS Code 237 (Civil and heavy engineering construction), (2) NAICS Code 325 (Chemical manufacturing), (3) NAICS Code 811 (Repair and maintenance), (4) NAICS Code 488 (Support activities for transportation), (5) NAICS Code 333 (Machinery manufacturing), and (6) NAICS Code 213 (Support activities for mining). During this period, when gas and oil prices were high and fracking technology has opened up vast amounts of economically-viable gas and oil reserves in Texas and elsewhere, it is easy to sense from the above list of industries that the Golden Triangle economy is still very much driven by energy, for which it has earned its reputation as "Energy Country" of the United States.

Because this present study is now the third of a series of three five-year periods, we were able to piece together a table to show how the combinations of industries that constituted "the engine of economic growth of Southeast Texas" have changed over the fifteen-year (1997-2014) span of the study. A total of sixteen (16) industries were determined to be the engine of economic growth in Southeast Texas. All except one appeared off and on the radar, so to speak. This exception is an industry that consistently prevailed to be at the core of that engine: Civil and heavy engineering construction (NAICS Code 237). Why that is remains to be researched and explained.

The two public-sector industries that started off as among the top employers in 2009-2014, became job losers later. It is clear to us that such industries are particularly subject to the

vagaries of local, state, or federal funding, which, in turn, depends on the business cycle. Thus, during recessionary times, when budgets are strained or on deficits, economic development planners should expect cutbacks or layoffs, and should accordingly make contingency plans ahead.

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