Shift-Share Analysis

A Further Review of Employment Growth in the Sangamon County Economic Area

Norm Sims, Executive Director
Springfield-Sangamon County Regional Planning Commission

ADVISING + PLANNING + EVALUATING + LEADING

Special thanks and credit to the Pacific Northwest Regional Economic Analysis Project (REAP) for material and analytic commentary presented in this report.

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Shift-Share Analysis:
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In its recent study of economic growth trends in the Sangamon County economic area, the Springfield-Sangamon County Regional Planning Commission (SSCRPC) mentioned *shift-share analysis* as a potential means to better understand how enterprises in the region are performing over time so that economic development targeting might be improved[1]. Shift-share is not a new technique[2], and is commonly used to assess how much regional income or job growth – or decline – can be attributed to local factors rather than to national trends. As it takes into account industry mix along with the influence of national and local trends, it can also identify potential unique strengths and weaknesses by local industry sector.

It does this by depicting and characterizing the growth that would have occurred had regional growth hypothetically tracked directly with the growth that took place nationwide. Sometimes this is referred to as "expected" or "standardized" growth, arising from the notion that growth nationwide can be used as a reference point for calibrating the character of a region's growth.

As was noted by a previous researcher discussing the shift-share technique, in spite of its rudimentary character shift-share analysis has had quite remarkable success among specialists in regional economics due to the fact that the statistical information required is very elementary while the analytical possibilities it offers are quite large.[3] However, and as with any econometric technique, there are criticisms of shift-share[4]. Even so, the U.S. Department of Commerce's Regional Economic Analysis Project (REAP), reports that shift-share analysis produces results that can be valuable for diagnosing, describing and building a better understanding of the major differences between local industry patterns of employment growth in comparison to national trends.

As the SSCRPC discussed the value of shift-share analysis in its study of the regional economy but did not provide such an analysis at that time, this paper is intended to extend upon the SSCRPC's previous work by providing a shift-share analysis of the Sangamon economic area in comparison to three similar regions: Champaign County, McLean County, and Peoria County. These same regions were compared to Sangamon in the previous report. To further describe the region's economic activity, it also provides a shift-share analysis for Illinois for comparison to the Sangamon regional results.

To provide the analysis the model and data provided by REAP was used, which is based upon U.S. Bureau of Economic Analysis data for the period 2008 to 2013.

The results for Sangamon County and the other three counties considered here are primarily depicted and examined in two tables provided for each region and the state as a whole. These tables isolate and detail the actual job growth from the hypothetical differences on an industry-by-industry basis. Separate sections are offered for each region studied, with comparative data provided in this paper's concluding section. Given that the technique used for all of these analyses is the same, the format used for reporting on each is presented similarly to assist readers.

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[1] Sims, E.N. (2015). *Planning for Growth: Reviewing Economic Growth Trends in the Springfield-Sangamon County Economic Area*. Springfield-Sangamon County Regional Planning Commission: Springfield, IL.

[2] Kalbacher, J.Z. (1979). Shift-share analysis: a modified approach, *Agricultural Economics Research*, Vol. 31, No.1. P. 12.

[3] Esteban-Marquillas, J.M. (1972). Shift-share analysis revisited, *Regional and Urban Economics*, Vol. 2, No. 3. Pp. 249-261.

[4] See, for example, Barff, R.A., and Knight, P.L. (2006). Dynamic shift-share analysis, *Growth and Change*, Vol. 19, Issue 2. Pp. 1-10.

I.   Shift-Share Analysis for Sangamon County

Employment Change Over 2008-2013

The unit of study for the analysis provided for each region considered in this report is employment change. Table 1-A, below, provides the starting point for a shift-share analysis of Sangamon County. The reader should note both the "Actual" and the "Standardized" growth columns for the county presented in this table as well as the others that follow. The first two columns in the table display the actual employment for 2008 and 2013 for 20 major industry sectors (plus "other/suppressed industries" as noted in the footnote to the table), as well as the share of local employment that industry provided during the indicated year. For example, the "State Government" sector employed 9,407 individuals in 2008, accounting for 7.5% of total employment in the region, but as the table shows, this had fallen to 8,546 by 2013, accounting for 7.0% of all jobs, a decline of 0.5% of employment share.

Table 1-A: Sangamon County Employment Growth, 2008-2013

Major Industry	Employment 2008 Level	Share[1]	2013 Level	Share[1]	Actual Growth Percent	Net	Standardized Growth[2] Percent	Net	Employment[3] 2013
Farm Employment	1,121	0.9	1,039	0.8	-7.31	-82	-0.19	-2	1,119
Construction	6,410	5.1	5,431	4.4	-15.27	-979	-14.57	-934	5,476
Manufacturing	3,653	2.9	3,191	2.6	-12.65	-462	-8.82	-322	3,331
Wholesale Trade	3,720	3.0	3,672	3.0	-1.29	-48	-2.85	-106	3,614
Retail Trade	13,938	11.1	13,891	11.3	-0.34	-47	-1.28	-179	13,759
Information	2,884	2.3	1,626	1.3	-43.62	-1,258	-7.37	-213	2,671
Finance and Insurance	8,791	7.0	9,680	7.9	10.11	889	8.32	732	9,523
Real Estate and Rental and Leasing	3,809	3.0	3,525	2.9	-7.46	-284	3.66	139	3,948
Professional, Scientific, and Technical Services	7,696	6.1	6,425	5.2	-16.52	-1,271	2.54	195	7,891
Management of Companies and Enterprises	793	0.6	747	0.6	-5.80	-46	9.17	73	866
Administrative and Waste Services	6,618	5.3	7,081	5.8	7.00	463	5.07	335	6,953
Educational Services	2,042	1.6	2,374	1.9	16.26	332	9.81	200	2,242
Health Care and Social Assistance	18,032	14.4	20,090	16.3	11.41	2,058	11.51	2,075	20,107
Arts, Entertainment, and Recreation	2,059	1.6	2,057	1.7	-0.10	-2	8.31	171	2,230
Accommodation and Food Services	9,389	7.5	9,339	7.6	-0.53	-50	6.18	580	9,969
Other Services (except Public Administration)	8,635	6.9	8,668	7.0	0.38	33	4.49	388	9,023
Federal Civilian	1,984	1.6	1,837	1.5	-7.41	-147	0.25	5	1,989
Military	420	0.3	440	0.4	4.76	20	-2.26	-9	411
State Government	9,407	7.5	8,546	7.0	-9.15	-861	-0.47	-44	9,363
Local Government	10,410	8.3	10,305	8.4	-1.01	-105	-3.43	-357	10,053
Other/Suppressed Industries*	3,529	2.8	3,000	2.4	-14.99	-529	6.74	238	3,767
Total Employment	**125,340**	**100.0**	**122,964**	**100.0**	**-1.90**	**-2,376**	**2.37**	**2,965**	**128,305**

1 Share: The percentage share of total employment by industry.
2 Standardized Growth: at the same rate as its counterpart at the national level had each industry grown.
3 Standardized Employment, 2013: The 2013 level of employment in each industry had it grown at the same rate as its counterparts at the national level since 2008.

- The "Other/Suppressed Industries" category portrayed in this table represents a combined total of those industries for which data were unavailable due to confidentiality restrictions. Those industries that are combined include: Forestry, Fishing, and Related Activities; Mining; Utilities; Transportation and Warehousing

Note: Percent growth figures may not add due to rounding by a factor of ± 0.01%

Source: Calculations by the Illinois Regional Economic Analysis Project (IL-REAP) with data provided by the U.S. Department of Commerce, Bureau of Economic Analysis

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The "Actual Growth" column reports the percent and net change in the total number of jobs for each industry category. It shows that between 2008 and 2013, a net total of 2,376 jobs were lost from the Sangamon County economy, resulting in a decline of -1.90%. The change by industry allows one to distinguish between faster and slower growing sectors irrespective to their relative importance, while the net change results highlight those industries that contributed most to the total net change.

The final columns in Table 1-A provide the "Standardized Employment" results. Standardized employment for 2013 reports the level of employment in each industry sector for Sangamon County *had its employment grown at the same rate as its national counterparts between 2008 and 2013*. This represents the hypothetical profile of the industry composition and level of local employment that would have occurred if the region had directly followed national trends. Using this comparison, the table indicates that the region **would have gained 2,965 jobs** during the period **rather than lost 2,376**; a net **shift of 5,341 jobs.**

Table 1-B, below, considers three different components of this shift, displaying the crux of the analysis.

Major Industry	National Growth[4]		Industry Mix[5]		Region Shift[6]	
	Percent	Net	Percent	Net	Percent	Net
Farm Employment	1.47	16	-1.66	-19	-7.13	-80
Construction	1.47	94	-16.03	-1,028	-0.70	-45
Manufacturing	1.47	54	-10.29	-376	-3.83	-140
Wholesale Trade	1.47	55	-4.32	-161	1.56	58
Retail Trade	1.47	204	-2.75	-383	0.94	132
Information	1.47	42	-8.84	-255	-36.25	-1,045
Finance and Insurance	1.47	129	6.86	603	1.79	157
Real Estate and Rental and Leasing	1.47	56	2.20	84	-11.12	-423
Professional, Scientific, and Technical Services	1.47	113	1.07	82	-19.05	-1,466
Management of Companies and Enterprises	1.47	12	7.70	61	-14.97	-119
Administrative and Waste Services	1.47	97	3.60	238	1.93	128
Educational Services	1.47	30	8.34	170	6.45	132
Health Care and Social Assistance	1.47	264	10.04	1,811	-0.10	-17
Arts, Entertainment, and Recreation	1.47	30	6.85	141	-8.41	-173
Accommodation and Food Services	1.47	138	4.72	443	-6.71	-630
Other Services (except Public Administration)	1.47	127	3.02	261	-4.11	-355
Federal Civilian	1.47	29	-1.22	-24	-7.66	-152
Military	1.47	6	-3.73	-16	7.02	29
State Government	1.47	138	-1.94	-182	-8.68	-817
Local Government	1.47	153	-4.90	-510	2.42	252
Other/Suppressed Industries*	1.47	52	5.27	186	-21.73	-767
Total Employment	**1.47**	**1,837**	**0.90**	**1,128**	**-4.26**	**-5,341**

Table 1-B: Sangamon County Shift-Share Components, 2008-2013

4 National Growth: The change in local employment that would have occurred for a specific industry had it grown at the national growth rate of all industries combined.

5 Industry Mix: The additional gain (or loss) in local employment that would have occurred for a specific industry (additional to the national growth effect) due to the industry growing faster (or slower) nationally than the rate of all industries combined.

6 Regional Shift: The additional gain (or loss) in local employment for a specific industry beyond the national growth and industry mix effects resulting from the industry growing faster (or slower) than the same industry nationally.

- The "Other/Suppressed Industries" category portrayed in this table represents a combined total of those industries for which data were unavailable due to confidentiality restrictions. Those industries that are combined include: Forestry, Fishing, and Related Activities; Mining; Utilities; Transportation and Warehousing

Note: Percent growth figures may not add due to rounding by a factor of ± 0.01%

Source: Calculations by the Illinois Regional Economic Analysis Project (IL-REAP)
with data provided by the U.S. Department of Commerce, Bureau of Economic Analysis

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The differences between the extent and composition of Sangamon County employment growth in comparison to the nation are broken down into three hypothetical components: *National Growth*, *Industry Mix* and *Regional Shift*. Each of these components attempts to account for a separate aspect of

the disparity – or *effects* – between the overall growths of employment nationally for each sector when compared to the county for the 2008-2013 period. We will explain this in a bit of detail here as the same explanation will apply when shift-share is considered for the other three counties analyzed in subsequent sections of this report.

The **National Growth Effect** is shown in the first two columns of Table 1-B. It describes how much of the regional industries' growth is explained by the overall growth of the national economy, for if the nation's whole economy is growing, one would generally expect to see positive change the region; the "rising tide that lifts all boats". The *National Growth Net* column in Table 1-B shows the growth that would have occurred in each industry in the Sangamon region if each had grown at the same rate as the average for all industries in the U.S. (a growth of 1.47%) during the period.

The National Growth assessment is then the most straightforward of the three provided in the table. It calibrates the growth in Sangamon County employment that may be attributed to overall national conditions and trends. If the industry composition and growth of employment had been the same in the county as the national average for all industries, then Sangamon County's employment growth over 2008-2013 would have matched the overall national employment growth rate of +1.47%, resulting in a net increase of 1,837 jobs. However it did not, showing an employment change of −1.90%.

Since some industry sectors will grow faster or slower than the average for all industries as a group, the **Industry Mix Effect** is also assessed and provided in the table in order to take this factor into account. This effect represents the share of regional industry growth that can be explained by the growth of the specific industry at the national level. The *Industry Mix Net* column factors that additional gain or loss into the analysis compared to the national average for industries in each sector. The industry mix component seeks to address and answer the question, "Did Sangamon County's employment change of −1.90% lag the overall national average of +1.47% because employment was more concentrated toward slower growing industries when compared to the nation?" That is, did Sangamon County's employment growth over 2008-2013 underperform the nation simply because its industry mix was weighted more heavily toward industries that experienced slower growth at the national level?

The most crucial result from the industry mix calculation is the "TOTAL" derived from summing over all industries. The positive value reported reveals that the industry composition employment for Sangamon County was only marginally tilted toward faster growing industries, yielding a gain of only 0.90% versus the national average of 1.47%, or +1,128 jobs compared to +1,837. A negative finding would have indicated that the Sangamon Regional economy was tilted toward slower growing industries.

The final component is the **Regional Competitive Effect**. It may be the most revealing of the three indicators, as it attempts to explain how much of the change in an industry "is due to some unique competitive advantage that the region possesses, because the growth cannot be explained by national trends in that industry or the economy as a whole."[5] The *Regional Shift Net* in Table 1-B represents the additional gain or loss in local employment for a specific industry beyond the national growth and industry mix growth, comparing it to the growth rate of others in the same industry. This component computes the gain or loss in local employment from an industry growing faster or slower than the same industry nationally. When employment in a local industry grows faster, or declines less, than its counterparts nationally, there occurs a positive "shift" in the "share" of national employment captured by that industry locally.

The "TOTAL" reported for the regional-shift component is −5,341, showing that Sangamon County employment slipped an additional −4.26% because a larger proportion of its local industries grew more

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[5] Sentz, R. (2011). Understanding Shift Share. Econometric Modeling Specialists, International.

slowly than the same industries did nationally: there was a regional effect within its industry base that cannot be explained solely by changes in the national economy or the growth characteristics of the various industry sectors within the national economy. In simple terms, the results would indicate that the Sangamon regional economy lost 5,341 jobs due to local – rather than national – factors.

Summary of the Shift-Share Results Revisited for Sangamon County, 2008-2013

As shift-share analysis provides a framework for describing the growth of local employment relative to the nation at large, the results for Sangamon County may be highlighted as follows:

Actual Growth		National Growth		Industry Mix		Regional Shift
-1.90%*	=	1.47%	+	0.90%	+	-4.26%
(-2,376)		(1,837)		(1,128)		(-5,341)
*Percent growth figures may not add due to rounding by a factor of ± 0.01%.						

Note that the shift-share identity can be rearranged to focus on identifying the difference between local (actual) and national growth rates as the sum of the industry mix and regional shift components:

Actual Growth - National Growth		Industry Mix		Regional Shift
-3.36%*	=	0.90%	+	-4.26%
(-4,213)		(1,128)		(-5,341)
*Percent growth figures may not add due to rounding by a factor of ± 0.01%.				

Sangamon County's employment change over 2008-2013 of **-1.90**% trailed the +**1.47%** growth of employment nationally by **-3.36%**. The shift-share analysis indicates that this difference can be accounted for by ***an industry mix in the region inclined toward industries that experienced marginally faster growth, but this was coupled with the fact that a large share of local industries – in both faster and slower growing sectors – underperformed their counterparts nationally.***

The reader should be aware that the employment estimates compiled by BEA measure the number of full- and part-time employees, plus the number of proprietors of unincorporated businesses. As will be the case in all of the tables presented here, people holding more than one job are counted in the employment estimates for each job they hold. This means BEA employment estimates represent a job count, not a number-of-people employed count. Also, BEA employment is by place-of-work, rather than by place-of-residence. Therefore, the jobs held by residents living outside Sangamon County but who commute to work in Sangamon County, are included in the employment (or job) count for Sangamon County.

The reader should also be aware that previous work by the SSCRPC found that the metro region scored relatively well in comparison to some counterpart metro areas in its ability to "snap-back" from economic downturns. Given the time period considered here, one result of that snap-back might be to overstate the effect of shift-share when the results for the Sangamon County economic area are compared to other benchmark areas. This effect was mentioned in our earlier study in a different context, and will be addressed again later in this report.

II.   Shift-Share Analysis for Champaign County

Employment Change Over 2008-2013

For comparison purposes, and as above for Sangamon County, Table 2-A, below, enumerates the employment levels and percent share of total employment for 2008 and 2013 by major industry group in Champaign County, just as Table 1-A did for Sangamon.

Table 2-A: Champaign County Employment Growth, 2008-2013							
	Employment					**Standardized**	
	2008		**2013**		**Actual Growth**	**Growth[2]**	**Employment[3]**
Major Industry	**Level**	**Share[1]**	**Level**	**Share[1]**	**Percent Net**	**Percent Net**	**2013**
Farm Employment	1,320	1.0	1,231	1.0	-6.74 -89	-0.19 -3	1,317
Construction	5,488	4.3	4,315	3.5	-21.37 -1,173	-14.57 -800	4,688
Manufacturing	8,915	6.9	7,458	6.0	-16.34 -1,457	-8.82 -786	8,129
Wholesale Trade	3,746	2.9	3,640	2.9	-2.83 -106	-2.85 -107	3,639
Retail Trade	12,402	9.7	11,037	8.9	-11.01 -1,365	-1.28 -159	12,243
Information	3,000	2.3	2,602	2.1	-13.27 -398	-7.37 -221	2,779
Finance and Insurance	4,409	3.4	4,661	3.7	5.72 252	8.32 367	4,776
Real Estate and Rental and Leasing	3,906	3.0	4,217	3.4	7.96 311	3.66 143	4,049
Professional, Scientific, and Technical Services	7,151	5.6	6,615	5.3	-7.50 -536	2.54 181	7,332
Management of Companies and Enterprises	599	0.5	523	0.4	-12.69 -76	9.17 55	654
Administrative and Waste Services	4,461	3.5	4,715	3.8	5.69 254	5.07 226	4,687
Educational Services	1,453	1.1	1,498	1.2	3.10 45	9.81 142	1,595
Health Care and Social Assistance	13,534	10.5	13,498	10.9	-0.27 -36	11.51 1,558	15,092
Arts, Entertainment, and Recreation	2,351	1.8	2,288	1.8	-2.68 -63	8.31 195	2,546
Accommodation and Food Services	9,416	7.3	9,663	7.8	2.62 247	6.18 582	9,998
Other Services (except Public Administration)	5,693	4.4	6,064	4.9	6.52 371	4.49 255	5,948
Federal Civilian	1,252	1.0	1,230	1.0	-1.76 -22	0.25 3	1,255
Military	401	0.3	418	0.3	4.24 17	-2.26 -9	392
Other/Suppressed Industries*	38,849	30.3	38,730	31.1	-0.31 -119	0.19 74	38,923
Total Employment	**128,346**	**100.0**	**124,403**	**100.0**	**-3.07 -3,943**	**1.32 1,698**	**130,044**

1 Share: The percentage share of total employment by industry.
2 Standardized Growth: at the same rate as its counterpart at the national level had each industry grown.
3 Standardized Employment, 2013: The 2013 level of employment in each industry had it grown at the same rate as its counterparts at the national level since 2008.

*The "Other/Suppressed Industries" category portrayed in this table represents a combined total of those industries for which data were unavailable due to confidentiality restrictions. Those industries that are combined include: Forestry, Fishing, and Related Activities; Mining; Utilities; Transportation and Warehousing; State Government; Local Government

Note: Percent growth figures may not add due to rounding by a factor of ± 0.01%

Source: Calculations by the Illinois Regional Economic Analysis Project (IL-REAP)
with data provided by the U.S. Department of Commerce, Bureau of Economic Analysis

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In terms of actual growth, over 2008-2013 a net total of **-3,943** jobs were trimmed from the Champaign County economy, amounting to a decline of **-3.07%.** Again, the percent change results by industry permit one to distinguish between the faster and slower sectors irrespective of their relative importance, while the net change results highlight those industries that contributed most to the total net change overall.

The standardized percent and net growth numbers reported in Table 2-A are hypothetical in nature. They posit the changes in Champaign County employment that would have occurred over 2008-2013

had each industry grown at the same rate as its national counterpart. The standardized "percent" growth column identifies the growth rate for each industry nationally, while the standardized "net" growth column simulates the resulting net changes in employment locally. The data not only allow one to directly compare local with national industry employment growth rates, they also translate national industry growth rates into hypothetically comparable changes in employment locally.

Although the standardized percent change reported for each industry identifies industry growth rates nationally, it should be noted that the "TOTAL" standardized percent change of 1.32% trailed the growth rate for total employment nationally of 1.47%. This arises because the proportional industry distribution or mix of employment in Champaign County was slightly tilted toward slower growing industries. In other words, simply by virtue of its industry mix, Champaign County was disposed toward experiencing slightly slower employment growth than the nation at large over 2008-2013.

Standardized employment for 2013 is the resulting level of employment in each industry for Champaign County had each grown at the same rate as its national counterpart since 2008. This presents a hypothetical profile of the industry composition and level of local employment that would have occurred had the county directly followed national industry trends.

Table 2-B: Champaign County Shift-Share Components, 2008-2013

Major Industry	National Growth[4] Percent	Net	Industry Mix[5] Percent	Net	Region Shift[6] Percent	Net
Farm Employment	1.47	19	-1.66	-22	-6.55	-86
Construction	1.47	80	-16.03	-880	-6.81	-373
Manufacturing	1.47	131	-10.29	-917	-7.52	-671
Wholesale Trade	1.47	55	-4.32	-162	0.02	1
Retail Trade	1.47	182	-2.75	-341	-9.72	-1,206
Information	1.47	44	-8.84	-265	-5.89	-177
Finance and Insurance	1.47	65	6.86	302	-2.61	-115
Real Estate and Rental and Leasing	1.47	57	2.20	86	4.30	168
Professional, Scientific, and Technical Services	1.47	105	1.07	77	-10.03	-717
Management of Companies and Enterprises	1.47	9	7.70	46	-21.85	-131
Administrative and Waste Services	1.47	65	3.60	161	0.63	28
Educational Services	1.47	21	8.34	121	-6.71	-97
Health Care and Social Assistance	1.47	198	10.04	1,359	-11.78	-1,594
Arts, Entertainment, and Recreation	1.47	34	6.85	161	-10.99	-258
Accommodation and Food Services	1.47	138	4.72	444	-3.56	-335
Other Services (except Public Administration)	1.47	83	3.02	172	2.03	116
Federal Civilian	1.47	18	-1.22	-15	-2.01	-25
Military	1.47	6	-3.73	-15	6.50	26
Other/Suppressed Industries*	1.47	569	-1.27	-495	-0.50	-193
Total Employment	**1.47**	**1,881**	**-0.14**	**-183**	**-4.40**	**-5,641**

4 National Growth: The change in local employment that would have occurred for a specific industry had it grown at the national growth rate of all industries combined.
5 Industry Mix: The additional gain (or loss) in local employment that would have occurred for a specific industry (additional to the national growth effect) due to the industry growing faster (or slower) nationally than the rate of all industries combined.
6 Regional Shift: The additional gain (or loss) in local employment for a specific industry beyond the national growth and industry mix effects resulting from the industry growing faster (or slower) than the same industry nationally.

- The "Other/Suppressed Industries" category portrayed in this table represents a combined total of those industries for which data were unavailable due to confidentiality restrictions. Those industries that are combined include: Forestry, Fishing, and Related Activities; Mining; Utilities; Transportation and Warehousing; State Government; Local Government

Note: Percent growth figures may not add due to rounding by a factor of ± 0.01%

Source: Calculations by the Illinois Regional Economic Analysis Project (IL-REAP)
with data provided by the U.S. Department of Commerce, Bureau of Economic Analysis

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As with Table 1-B for Sangamon County, Table 2-B, above, contains the crux of the shift-share results for Champaign. Differences between the extent and composition of local employment growth with

comparison to the nation are again broken down into the hypothetical components: national growth, industry mix, and regional shift. Each component attempts to account for a separate aspect of the disparity between the overall growths of employment locally vs. nationally over 2008-2013.

In terms of the national component, if the industry composition and growth of employment had been the same locally as nationally, then Champaign County's employment growth over 2008-2013 would have matched the overall national rate of **1.47%**.

The industry mix component seeks to determine if the Champaign County employment change of **-3.07%** lags the overall national average (**1.47%**) because employment was more concentrated toward slower growing industries when compared to the nation. The results are derived by multiplying local employment in each sector for 2008 by the difference between the national growth rate for each sector and the total national employment growth rate (**1.47%**). The industry mix results report positive values for those industries that experienced employment growth above the **1.47%** national average, while negative values are posted for those industries that grew at rates less than **1.47%**.

The most crucial result from the industry mix calculation is the "TOTAL" derived from summing over all industries. The negative value reported reveals that the industry composition employment for Champaign County was tilted toward slower growing industries. Positive results would have indicated just the opposite.

The third shift-share component, tagged the "Regional Shift", computes the gain (or loss) in local employment from an industry growing faster (or slower) than the same industry nationally. When employment in a local industry grows faster (or declines less) than its counterpart nationally there occurs a positive "shift" in the net "share" of national employment captured by that industry locally. The "TOTAL" reported for the regional-shift component is **-5,641**, showing that Champaign County employment slipped an additional **-4.40%** because a larger proportion of industries grew more slowly locally than nationally.

Summary of the Shift-Share Results Revisited for Champaign County, 2008-2013

Shift-share analysis provides a framework for describing the growth of local employment relative to the nation at large. Results for Champaign County may be highlighted as follows:

Actual Growth		National Growth		Industry Mix		Regional Shift
-3.07%*	=	1.47%	+	-0.14%	+	-4.40%
(-3,943)		(1,881)		(-183)		(-5,641)

*Percent growth figures may not add due to rounding by a factor of ± 0.01%.

Note that the shift-share identity can be rearranged to focus on identifying the difference between local (actual) and national growth rates as the sum of the industry mix and regional shift components:

Actual Growth - National Growth		Industry Mix		Regional Shift
-4.54%*	=	-0.14%	+	-4.40%
(-5,824)		(-183)		(-5,641)

*Percent growth figures may not add due to rounding by a factor of ± 0.01%.

In summary, Champaign County's employment change over 2008-2013 of **-3.07%** trailed the **1.47%** growth of employment nationally by **-4.54%**. Unlike the case with Sangamon County, *this difference was accounted for by an industry mix inclined toward industries that experienced slower growth, coupled with the fact that a large share of local industries underperformed their counterparts nationally.*

III.   Shift-Share Analysis for McLean County

Employment Change Over 2008-2013

The results in this section consider McLean County's employment growth over the interval 2008 to 2013 using shift-share analysis. Between 2008 and 2013 McLean County's employment declined from **113,289** to **111,669**, a net loss of **1,620** jobs, amounting to drop of **-1.43%**. This represents the actual growth for the period.

Table 3-A: McLean County Employment Growth, 2008-2013								
	Employment						**Standardized**	
	2008		**2013**		**Actual Growth**		**Growth[2]**	**Employment[3]**
Major Industry	**Level**	**Share[1]**	**Level**	**Share[1]**	**Percent**	**Net**	**Percent Net**	**2013**
Farm Employment	1,434	1.3	1,341	1.2	-6.49	-93	-0.19	-3	1,431
Utilities	213	0.2	240	0.2	12.68	27	-3.30	-7	206
Construction	4,693	4.1	3,673	3.3	-21.73	-1,020	-14.57	-684	4,009
Manufacturing	5,670	5.0	4,527	4.1	-20.16	-1,143	-8.82	-500	5,170
Wholesale Trade	2,839	2.5	2,492	2.2	-12.22	-347	-2.85	-81	2,758
Retail Trade	11,032	9.7	10,559	9.5	-4.29	-473	-1.28	-141	10,891
Transportation and Warehousing	2,553	2.3	2,731	2.4	6.97	178	2.62	67	2,620
Information	1,260	1.1	961	0.9	-23.73	-299	-7.37	-93	1,167
Finance and Insurance	13,985	12.3	15,320	13.7	9.55	1,335	8.32	1,164	15,149
Real Estate and Rental and Leasing	2,846	2.5	2,983	2.7	4.81	137	3.66	104	2,950
Administrative and Waste Services	6,580	5.8	7,334	6.6	11.46	754	5.07	333	6,913
Educational Services	2,057	1.8	2,155	1.9	4.76	98	9.81	202	2,259
Health Care and Social Assistance	11,454	10.1	10,439	9.3	-8.86	-1,015	11.51	1,318	12,772
Arts, Entertainment, and Recreation	1,843	1.6	2,121	1.9	15.08	278	8.31	153	1,996
Accommodation and Food Services	9,226	8.1	9,748	8.7	5.66	522	6.18	570	9,796
Other Services (except Public Administration)	5,549	4.9	5,835	5.2	5.15	286	4.49	249	5,798
Federal Civilian	767	0.7	525	0.5	-31.55	-242	0.25	2	769
Military	327	0.3	336	0.3	2.75	9	-2.26	-7	320
Other/Suppressed Industries*	28,961	25.6	28,349	25.4	-2.11	-612	1.16	337	29,298
Total Employment	**113,289**	**100.0**	**111,669**	**100.0**	**-1.43**	**-1,620**	**2.63 2,984**		**116,273**

1Share: The percentage share of total employment by industry.
2Standardized Growth: at the same rate as its counterpart at the national level had each industry grown.
3Standardized Employment, 2013: The 2013 level of employment in each industry had it grown at the same rate as its counterparts at the national level since 2008.
*The "Other/Suppressed Industries" category portrayed in this table represents a combined total of those industries for which data were unavailable due to confidentiality restrictions. Those industries that are combined include: Forestry, Fishing, and Related Activities; Mining; Professional, Scientific, and Technical Services; Management of Companies and Enterprises; State Government; Local Government
Note: Percent growth figures may not add due to rounding by a factor of ± 0.01%
Source: Calculations by the Illinois Regional Economic Analysis Project (IL-REAP)
with data provided by the U.S. Department of Commerce, Bureau of Economic Analysis

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As with the previous tables, the standardized percent and net growth numbers reported in Table 3-A are hypothetical in nature. They post the changes in McLean County employment that would have occurred over 2008-2013 had each industry grown at the same rate as its national counterpart. The standardized "percent" growth column identifies the growth rate for each industry nationally, while the standardized "net" growth column simulates the resulting net changes in employment locally. The data not only allow one to directly compare local with national industry employment growth rates, they also translate national industry growth rates into hypothetically comparable changes in employment locally.

Although the standardized percent change reported for each industry identifies industry growth rates nationally, it should be noted that the "TOTAL" standardized percent change of **2.63%** was above the growth rate for total employment nationally of **1.47%**. This arises because the proportional industry

distribution or mix of employment in McLean County being tilted toward faster growing industries. In other words, simply by virtue of its industry mix, McLean County was favorably disposed toward experiencing slightly faster employment growth than the nation at large over 2008-2013.

Standardized employment for 2013 is the resulting level of employment in each industry for McLean County had each grown at the same rate as its national counterpart since 2008. This presents a hypothetical profile of the industry composition and level of local employment that would have occurred had the county directly followed national industry trends.

Table 3-B, below, again displays the crux of the shift-share results. Differences between the extent and composition of local employment growth with comparison to the nation are broken down into the hypothetical components: national growth, industry mix, and regional shift. Each component attempts to account for a separate aspect of the disparity between the overall growths of employment locally vs. nationally over 2008-2013.

Table 3-B: McLean County Shift-Share Components, 2008-2013

Major Industry	National Growth[4]		Industry Mix[5]		Region Shift[6]	
	Percent	Net	Percent	Net	Percent	Net
Farm Employment	1.47	21	-1.66	-24	-6.30	-90
Utilities	1.47	3	-4.76	-10	15.97	34
Construction	1.47	69	-16.03	-752	-7.17	-336
Manufacturing	1.47	83	-10.29	-583	-11.34	-643
Wholesale Trade	1.47	42	-4.32	-123	-9.37	-266
Retail Trade	1.47	162	-2.75	-303	-3.01	-332
Transportation and Warehousing	1.47	37	1.15	29	4.35	111
Information	1.47	18	-8.84	-111	-16.36	-206
Finance and Insurance	1.47	205	6.86	959	1.22	171
Real Estate and Rental and Leasing	1.47	42	2.20	63	1.15	33
Administrative and Waste Services	1.47	96	3.60	237	6.39	421
Educational Services	1.47	30	8.34	172	-5.04	-104
Health Care and Social Assistance	1.47	168	10.04	1,150	-20.37	-2,333
Arts, Entertainment, and Recreation	1.47	27	6.85	126	6.77	125
Accommodation and Food Services	1.47	135	4.72	435	-0.52	-48
Other Services (except Public Administration)	1.47	81	3.02	168	0.67	37
Federal Civilian	1.47	11	-1.22	-9	-31.80	-244
Military	1.47	5	-3.73	-12	5.01	16
Other/Suppressed Industries*	1.47	424	-0.30	-87	-3.28	-949
Total Employment	**1.47**	**1,660**	**1.17**	**1,324**	**-4.06**	**-4,604**

4 National Growth: The change in local employment that would have occurred for a specific industry had it grown at the national growth rate of all industries combined.
5 Industry Mix: The additional gain (or loss) in local employment that would have occurred for a specific industry (additional to the national growth effect) due to the industry growing faster (or slower) nationally than the rate of all industries combined.
6 Regional Shift: The additional gain (or loss) in local employment for a specific industry beyond the national growth and industry mix effects resulting from the industry growing faster (or slower) than the same industry nationally.

- The "Other/Suppressed Industries" category portrayed in this table represents a combined total of those industries for which data were unavailable due to confidentiality restrictions. Those industries that are combined include: Forestry, Fishing, and Related Activities; Mining; Professional, Scientific, and Technical Services; Management of Companies and Enterprises; State Government; Local Government.

Note: Percent growth figures may not add due to rounding by a factor of ± 0.01%

Source: Calculations by the Illinois Regional Economic Analysis Project (IL-REAP)
with data provided by the U.S. Department of Commerce, Bureau of Economic Analysis

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The National Growth component assesses whether or not the industry composition and growth of employment in McLean County was the same locally as nationally. If it had been over 2008-2013, it would have matched the overall national rate of **1.47%**. Instead it was 1.17%.

The industry mix component asks if McLean County's employment change of **-1.43%** lagged the overall national average (**1.47%**) because employment was more concentrated toward faster growing industries when compared to the nation. The results are derived by multiplying local employment in each sector for 2008 by the difference between the national growth rate for each sector and the total national employment growth rate (**1.47%**). The industry mix results report positive values for those industries that experienced employment growth above the **1.47%** national average, while negative values are posted for those industries that grew at rates less than **1.47%**.

The most crucial result from the industry mix calculation is the "TOTAL" derived from summing over all industries. The positive value reported reveals that the industry composition employment for McLean County was tilted toward faster growing industries. Negative results would have indicated just the opposite.

The third shift-share component, tagged the "Regional Shift", computes the gain (or loss) in local employment from an industry growing faster (or slower) than the same industry nationally. When employment in a local industry grows faster (or declines less) than its counterpart nationally there occurs a positive "shift" in the net "share" of national employment captured by that industry locally. The "TOTAL" reported for the regional-shift component is **-4,603**, showing that McLean County employment slipped an additional **-4.06%** because a larger proportion of industries grew more slowly locally than nationally.

Summary of the Shift-Share Results Revisited for McLean County, 2008-2013

Shift-share analysis provides a framework for describing the growth of local employment relative to the nation at large. Results for McLean County may be highlighted as follows:

Actual Growth	National Growth	Industry Mix	Regional Shift
-1.43%* =	1.47% +	1.17% +	-4.06%
(-1,620)	(1,660)	(1,324)	(-4,604)

*Percent growth figures may not add due to rounding by a factor of ± 0.01%.

As noted previously, the shift-share identity can be rearranged to focus on identifying the difference between local (actual) and national growth rates as the sum of the industry mix and regional shift components:

Actual Growth - National Growth	Industry Mix	Regional Shift
-2.90%*	= 1.17% +	-4.06%
(-3,280)	(1,324)	(-4,604)

*Percent growth figures may not add due to rounding by a factor of ± 0.01%.

McLean County's employment change over 2008-2013 of **-1.43**% trailed the **1.47%** growth of employment nationally by **-2.90%**. More like Sangamon, *accounting for this difference was an industry mix inclined toward industries that experienced faster growth, coupled with the fact that a large share of local industries underperformed their counterparts nationally.*

IV. Shift-Share Analysis for Peoria County

Employment Change Over 2008-2013

The research results presented in this section addresses Peoria County's employment growth over the interval 2008 to 2013 using shift-share analysis. As Table 4-A, below, shows, between 2008 and 2013 Peoria County's employment declined from **127,656** to **124,483**, a net loss of **3,173** jobs, amounting to drop of **-2.49%**.

	Employment				Actual Growth		Standardized		
Major Industry	**2008 Level**	**Share[1]**	**2013 Level**	**Share[1]**	**Percent**	**Net**	**Growth[2] Percent**	**Net**	**Employment[3] 2013**
Farm Employment	825	0.6	772	0.6	-6.42	-53	-0.19	-2	823
Utilities	746	0.6	796	0.6	6.70	50	-3.30	-25	721
Construction	5,946	4.7	4,604	3.7	-22.57	-1,342	-14.57	-866	5,080
Manufacturing	11,142	8.7	8,435	6.8	-24.30	-2,707	-8.82	-983	10,159
Wholesale Trade	4,327	3.4	3,979	3.2	-8.04	-348	-2.85	-123	4,204
Retail Trade	12,711	10.0	12,049	9.7	-5.21	-662	-1.28	-163	12,548
Transportation and Warehousing	2,670	2.1	3,297	2.6	23.48	627	2.62	70	2,740
Information	2,176	1.7	1,953	1.6	-10.25	-223	-7.37	-160	2,016
Finance and Insurance	6,009	4.7	5,700	4.6	-5.14	-309	8.32	500	6,509
Real Estate and Rental and Leasing	3,894	3.1	3,309	2.7	-15.02	-585	3.66	143	4,037
Professional, Scientific, and Technical Services	10,810	8.5	10,711	8.6	-0.92	-99	2.54	274	11,084
Management of Companies and Enterprises	822	0.6	1,091	0.9	32.73	269	9.17	75	897
Administrative and Waste Services	9,312	7.3	8,859	7.1	-4.86	-453	5.07	472	9,784
Educational Services	2,814	2.2	2,987	2.4	6.15	173	9.81	276	3,090
Health Care and Social Assistance	23,251	18.2	25,655	20.6	10.34	2,404	11.51	2,676	25,927
Arts, Entertainment, and Recreation	1,976	1.5	2,570	2.1	30.06	594	8.31	164	2,140
Accommodation and Food Services	8,433	6.6	8,018	6.4	-4.92	-415	6.18	521	8,954
Other Services (except Public Administration)	7,513	5.9	7,823	6.3	4.13	310	4.49	337	7,850
Federal Civilian	1,598	1.3	1,617	1.3	1.19	19	0.25	4	1,602
Military	435	0.3	444	0.4	2.07	9	-2.26	-10	425
Other/Suppressed Industries*	10,246	8.0	9,814	7.9	-4.22	-432	-0.37	-37	10,209
Total Employment	**127,656**	**100.0**	**124,483**	**100.0**	**-2.49**	**-3,173**	**2.46**	**3,143**	**130,799**

Table 4-A: Peoria County Employment Growth, 2008-2013

1Share: The percentage share of total employment by industry.
2Standardized Growth: at the same rate as its counterpart at the national level had each industry grown.
3Standardized Employment, 2013: The 2013 level of employment in each industry had it grown at the same rate as its counterparts at the national level since 2008.
*The "Other/Suppressed Industries" category portrayed in this table represents a combined total of those industries for which data were unavailable due to confidentiality restrictions. Those industries that are combined include: Forestry, Fishing, and Related Activities; Mining; State Government; Local Government
Note: Percent growth figures may not add due to rounding by a factor of ± 0.01%
Source: Calculations by the Illinois Regional Economic Analysis Project (IL-REAP) with data provided by the U.S. Department of Commerce, Bureau of Economic Analysis

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As with the previous tables, the percent change results by industry permit distinguishing between the faster and slower sectors irrespective of their relative importance, while the net change results highlight those industries that contributed most to the total net change overall.

The standardized percent and net growth numbers reported in Table 4-A are hypothetical in nature. They demonstrate the changes in Peoria County employment that would have occurred over 2008-2013 had each industry grown at the same rate as its national counterpart. The standardized "percent" growth column identifies the growth rate for each industry nationally, while the standardized "net"

growth column simulates the resulting net changes in employment locally. The data not only allow one to directly compare local with national industry employment growth rates, they also translate national industry growth rates into hypothetically comparable changes in employment locally.

Although the standardized percent change reported for each industry identifies industry growth rates nationally, it should be noted that the "TOTAL" standardized percent change of **2.46%** trailed the growth rate for total employment nationally of **1.47%**. This arises because the proportional industry distribution or mix of employment in Peoria County was tilted toward faster growing industries. In other words, simply by virtue of its industry mix, Peoria County was favorably disposed toward experiencing slightly faster employment growth than the nation at large over 2008-2013.

The standardized employment for 2013 is the resulting level of employment in each industry for Peoria County had each grown at the same rate as its national counterpart since 2008. This presents a hypothetical profile of the industry composition and level of local employment that would have occurred had the county directly followed national industry trends.

As is the case with the previous Table B's, Table 4-B, below, demonstrates the three effects associated with shift-share.

Table 4-B: Peoria County Shift-Share Components, 2008-2013						
Major Industry	**National Growth**[4]		**Industry Mix**[5]		**Region Shift**[6]	
	Percent	**Net**	**Percent**	**Net**	**Percent**	**Net**
Farm Employment	1.47	12	-1.66	-14	-6.23	-51
Utilities	1.47	11	-4.76	-36	10.00	75
Construction	1.47	87	-16.03	-953	-8.00	-476
Manufacturing	1.47	163	-10.29	-1,146	-15.47	-1,724
Wholesale Trade	1.47	63	-4.32	-187	-5.19	-225
Retail Trade	1.47	186	-2.75	-349	-3.93	-499
Transportation and Warehousing	1.47	39	1.15	31	20.87	557
Information	1.47	32	-8.84	-192	-2.87	-63
Finance and Insurance	1.47	88	6.86	412	-13.47	-809
Real Estate and Rental and Leasing	1.47	57	2.20	86	-18.69	-728
Professional, Scientific, and Technical Services	1.47	158	1.07	116	-3.45	-373
Management of Companies and Enterprises	1.47	12	7.70	63	23.56	194
Administrative and Waste Services	1.47	136	3.60	335	-9.93	-925
Educational Services	1.47	41	8.34	235	-3.66	-103
Health Care and Social Assistance	1.47	341	10.04	2,335	-1.17	-272
Arts, Entertainment, and Recreation	1.47	29	6.85	135	21.75	430
Accommodation and Food Services	1.47	124	4.72	398	-11.10	-936
Other Services (except Public Administration)	1.47	110	3.02	227	-0.36	-27
Federal Civilian	1.47	23	-1.22	-19	0.94	15
Military	1.47	6	-3.73	-16	4.33	19
Other/Suppressed Industries*	1.47	150	-1.83	-188	-3.85	-395
Total Employment	**1.47**	**1,871**	**1.00**	**1,273**	**-4.95**	**-6,316**

4 National Growth: The change in local employment that would have occurred for a specific industry had it grown at the national growth rate of all industries combined.
5 Industry Mix: The additional gain (or loss) in local employment that would have occurred for a specific industry (additional to the national growth effect) due to the industry growing faster (or slower) nationally than the rate of all industries combined.
6 Regional Shift: The additional gain (or loss) in local employment for a specific industry beyond the national growth and industry mix effects resulting from the industry growing faster (or slower) than the same industry nationally.

- The "Other/Suppressed Industries" category portrayed in this table represents a combined total of those industries for which data were unavailable due to confidentiality restrictions. Those industries that are combined include: Forestry, Fishing, and Related Activities; Mining; State Government; Local Government.

Note: Percent growth figures may not add due to rounding by a factor of ± 0.01%

Source: Calculations by the Illinois Regional Economic Analysis Project (IL-REAP)
with data provided by the U.S. Department of Commerce, Bureau of Economic Analysis

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The National Growth component is the most straightforward. It calibrates the growth in Peoria County employment that may be attributed to overall national conditions and trends. If the industry composition and growth of employment had been the same locally as nationally, then Peoria County's employment growth over 2008-2013 would have matched the overall national rate of **1.47%**.

As was the case with the other counties, the Industry Mix component seeks to address and answer the question: "Did the Peoria County employment change of **-2.49%** lag the overall national average (**1.47%**) because employment was more concentrated toward faster growing industries when compared to the nation?" That is, did Peoria County's employment growth over 2008-2013 underperform the nation simply because its industry mix was weighted more heavily toward industries that experienced faster growth at the national level?

The results are derived by multiplying local employment in each sector for 2008 by the difference between the national growth rate for each sector and the total national employment growth rate (**1.47%**). The industry mix results report positive values for those industries that experienced employment growth above the **1.47%** national average, while negative values are posted for those industries that grew at rates less than **1.47%**.

The most crucial result from the industry mix calculation is the "TOTAL" derived from summing over all industries. The positive value reported reveals that the industry composition employment for Peoria County was tilted toward faster growing industries. Negative results would have indicated just the opposite.

The third shift-share component, tagged the Regional Shift, computes the gain (or loss) in local employment from an industry growing faster (or slower) than the same industry nationally. When employment in a local industry grows faster (or declines less) than its counterpart nationally there occurs a positive "shift" in the net "share" of national employment captured by that industry locally. The "TOTAL" reported for the regional-shift component is **-6,316**, showing that Peoria County employment slipped an additional **-4.95%** because a larger proportion of industries grew more slowly locally than nationally.

Summary of the Shift-Share Results Revisited for Peoria County, 2008-2013

Shift-share analysis provides a framework for describing the growth of local employment relative to the nation at large. Results for Peoria County may be highlighted as follows:

Actual Growth	**National Growth**	**Industry Mix**	**Regional Shift**
-2.49%*(-3,173) =	1.47%(1,871)	+ 1.00%(1,273) +	-4.95%(-6,316)

*Percent growth figures may not add due to rounding by a factor of ± 0.01%.

Note as before that the shift-share identity can be rearranged to focus on identifying the difference between local (actual) and national growth rates as the sum of the industry mix and regional shift components:

Actual Growth - National Growth	**Industry Mix**	**Regional Shift**
-3.95%*(-5,044)	= 1.00%(1,273) +	-4.95%(-6,316)

*Percent growth figures may not add due to rounding by a factor of ± 0.01%.

Peoria County's employment change over 2008-2013 of **-2.49**% trailed the **1.47%** growth of employment nationally by **-3.95%**. The shift-share analysis indicates that this *difference can be accounted for by an industry mix inclined toward industries that experienced faster growth, coupled with the fact that a large share of local industries underperformed their counterparts nationally*.

V. Comparing Sangamon County to the Three Benchmark Counties

In its earlier report looking at long-range trends affecting the local economy, the SSCRPC compared the Sangamon regional economic area to the three other counties addressed in the sections above, benchmarking Sangamon against three similar areas. This paper does so as well. The SSCRPC believes that providing this comparative shift-share analysis is beneficial in two ways:

■ It provides some assessment as to how employment shifts in Sangamon County compare to growth or decline in other similar central Illinois jurisdictions; and

■ Doing so may be useful in coming to a better understanding about how wider regional effects might influence the Sangamon economic area.

Table 5-A, below, is provided to begin this comparison using the data drawn from the shift-share analysis for each county above. This table compares the totals for Sangamon County to those of the other three counties analyzed. To provide additional perspective, the table also includes what might be thought of as the totals for a hypothetical "average" central Illinois county. The totals for this "average" county are drawn from the average of the totals for the four counties for which the shift-share analysis was done, anticipating that this average is more representative of metro areas in the central Illinois region as a whole over recent years and to provide an additional baseline for the comparison.

TABLE 5-A: Comparison of Employment Growth, 2008-2013							
	Total Employment		Actual Growth		Standardized Growth		
	2008	2013	Percent	Net	Percent	Net	Employment
Sangamon	125,340	122,964	-1.90	-2,376	2.37	2,965	128.305
Champaign	128,346	124,403	-3.07	-3,943	1.32	1,698	130,044
McLean	113,289	111,669	-1.43	-1,620	2.63	2,984	116,273
Peoria	127,656	124,483	-2.49	-3,173	2.46	3,143	130,799
Avg. of Counties	123,408	120,880	-2.22	-2,778	2.20	2,698	126,355

Numbers above subject to rounding.

The reader will note first that all of the counties considered in this analysis show a net loss in employment both in percentage and net between 2008 and 2013. The largest loss in both accrues to Champaign, with a percentage loss of 3.07% due to a decline of 3,943 jobs. However, consideration should be given to the results that show that of the four counties studied, Champaign was the one most linked with slower growing industry sectors.

In comparison to the other counties, Sangamon County performs comparatively well, with a percentage loss of 1.90%, a smaller loss than all but McLean, and relatively comparable to the hypothetical average of the four counties. But one should also note that on a standardized basis Champaign would have grown at only 1.32%, with a net growth of 1,698 jobs. Both McLean and Peoria counties could have performed better than either Sangamon or Champaign.

This leads to a consideration of National, Industry Mix, and Regional effects in comparing the four counties and our hypothetical "average" region. Table 5-B provides this comparison.

TABLE 5-B: Comparison of Shift-Share Components, 2008-2013						
	National Growth Effect		Industry Mix Effect		Regional Effect	
	Percent National Growth	Net Growth Total	Percent	Net	Percent	Shift Net
Sangamon	1.47	1,837	0.90	1,128	-4.26	-5,341
Champaign	1.47	1,881	-0.14	-183	-4.40	-5,641
McLean	1.47	1,660	1.17	1,324	-4.06	-4,604
Peoria	1.47	1,871	1.00	1,273	-4.95	-6,316
Avg. of Counties	1.47	1,813	.733	885.5	-4.42	-5,476

Numbers above subject to rounding.

Remember that these results provide the crux of the shift-share analysis, with the differences between the extent and composition of the counties employment growth in comparison to the nation being broken down into three hypothetical components: the national growth, industry mix and regional shift.

National growth is the most straight forward, demonstrating that portion of the counties performance that may be attributable to overall national conditions and trends. The National Net Growth column indicates the growth that would have occurred in each county, as well as the hypothetical average county, if the industries in that county had simply grown at the same rate as the average for all industries in the U.S. One has to make note of the fact that other than for McLean, the national net growth effects are quite comparable. This begins to change, however, when Industry Mix is taken into account.

As noted previously, Industry Mix considers that not all industry sectors grow at the same rate; some grow faster while others grow slower. So Industry Mix represents the share of a region's growth than can be ascribed to the growth of industry sectors at the national level rather than unique local factors. The Industry Mix Net column factors that additional gain or loss into the share of employment that may be shifted. Comparatively, the more positive the number, the greater the local mix to faster growing industries, while a negative value for a county indicates that its industry composition is tilted toward slower growing industries.

Although all of the counties but Champaign show positive results in terms of their economies containing faster growing sectors, the results indicate that McLean County has an industry mix more representative of faster growing industries than do the other counties. Peoria tends to the second highest mix, while Sangamon's mix tends toward somewhat slower growing ones.

The final component considered in Table 5-B is the Regional Effect. It is considered to be the most revealing as it attempts to explain how much of the change is due to a region having a unique competitive advantage or disadvantage that cannot be explained by industry trends or economic trends in the nation as a whole alone. The sign and magnitude of the totals provided under Regional Effect help to identify how much a local economy gained or lost due to its unique industrial circumstances.

In this regard, Peoria was more affected by local circumstances, showing a negative percentage shift of almost 5.0%, than were the other three regions. But for this local effect, Peoria would have added over 6,000 jobs to its employment base between 2008 and 2013.

Even though it had a negative percentage net (-4.06), McLean's economy was the least effected. Sangamon, on the other hand, scored only slightly worse (-4.26). But even so, Sangamon could have gained 5,341 additional jobs if regional industrial factors leading to the negative outcome could be identified and addressed.

The general similarity of the results for the counties studied would lead one to consider whether or not all of them show regional effect losses more due to conditions existing within the *state's* economy than their *local* ones; that is, did the Illinois economy have a direct effect on the shift share results that might be cloaked when comparison is made only to the national economy. While the shift-share analysis provided in this report is based in part upon the degree to which local growth or decline is affected by national forces, it is just as reasonable to conclude that they may be based upon state ones as well.

Assuming that state-wide economic conditions may have an effect on local economies is not inconsequential and is somewhat intuitive. The basis for the shift-share analysis itself begins by assuming that the national economy has an effect on local ones, so it is not illogical to assume that a state's economic activity may influence sub-state regions as well.

Also, and given the period studied, it is possible that the results of the shift-share analysis for these four central Illinois counties could be artifacts of Illinois' tendency to both enter and exit recessions later than the nation as a whole because of the state's industry mix. This possibility was mentioned in the SSCRPC's previous long-term review of the regional economic forces. It would also be somewhat consistent with earlier work by the SSCRPC related to the economic resiliency of Sangamon county and the other three counties studied.[6]

Granted that although the national economic and industry mix effects are considered in the shift-share analysis, an "Illinois Effect" is not. This led the SSCRPC to use the REAP model to conduct a shift-share analysis of the state to determine the comparability of its results with those reported for the four counties above.

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[6] Uden, A. (2014), How Resilient is Our Regional Economy?: A Peer Comparison of the Springfield Metropolitan Area's Resiliency Capacity. Springfield-Sangamon

VI.   Considering State Shift-Share in Relation to the County Results

As mentioned in the last section, the SSCRPC thought it useful to compare the results of its shift-share analysis for the four counties identified above with that of the state as a whole. The same technique and approach was used for the state as was for the four counties, and the results are similarly reported in the two tables below.

Illinois Employment Change Over 2008-2013

The shift-share analysis results provided in this section evaluate employment change in the Illinois economy for the period provided. The results shown in the Table 6-A, below, enumerate the employment levels and percent share of total employment in the state for 2008 and 2013.

Major Industry	Employment 2008 Level	2008 Share[1]	2013 Level	2013 Share[1]	Actual Growth Percent	Actual Growth Net	Standardized Growth[2] Percent	Standardized Growth[2] Net	Standardized Employment[3] 2013
Farm Employment	78,062	1.0	71,938	1.0	-7.85	-6,124	-0.19	-148	77,914
Forestry, Fishing, and Related Activities	11,957	0.2	12,349	0.2	3.28	392	5.32	636	12,593
Mining	23,194	0.3	29,225	0.4	26.00	6,031	32.57	7,554	30,748
Utilities	24,707	0.3	24,719	0.3	0.05	12	-3.30	-815	23,892
Construction	388,587	5.1	309,321	4.1	-20.40	-79,266	-14.57	-56,613	331,974
Manufacturing	676,108	8.9	600,782	8.0	-11.14	-75,326	-8.82	-59,639	616,469
Wholesale Trade	330,007	4.4	318,984	4.2	-3.34	-11,023	-2.85	-9,406	320,601
Retail Trade	742,323	9.8	709,981	9.5	-4.36	-32,342	-1.28	-9,517	732,806
Transportation and Warehousing	305,146	4.0	321,029	4.3	5.21	15,883	2.62	7,987	313,133
Information	135,110	1.8	117,774	1.6	-12.83	-17,336	-7.37	-9,964	125,146
Finance and Insurance	474,841	6.3	497,806	6.6	4.84	22,965	8.32	39,523	514,364
Real Estate and Rental and Leasing	282,244	3.7	278,574	3.7	-1.30	-3,670	3.66	10,336	292,580
Professional, Scientific, and Technical Services	529,767	7.0	535,920	7.1	1.16	6,153	2.54	13,439	543,206
Management of Companies and Enterprises	103,306	1.4	109,427	1.5	5.93	6,121	9.17	9,468	112,774
Administrative and Waste Services	503,762	6.7	525,364	7.0	4.29	21,602	5.07	25,527	529,289
Educational Services	180,468	2.4	202,374	2.7	12.14	21,906	9.81	17,698	198,166
Health Care and Social Assistance	798,376	10.6	858,444	11.4	7.52	60,068	11.51	91,887	890,263
Arts, Entertainment, and Recreation	148,655	2.0	156,213	2.1	5.08	7,558	8.31	12,354	161,009
Accommodation and Food Services	480,279	6.3	494,629	6.6	2.99	14,350	6.18	29,691	509,970
Other Services (except Public Administration)	441,348	5.8	454,309	6.1	2.94	12,961	4.49	19,806	461,154
Federal Civilian	87,412	1.2	81,231	1.1	-7.07	-6,181	0.25	217	87,629
Military	48,545	0.6	43,324	0.6	-10.75	-5,221	-2.26	-1,097	47,448
State Government	156,481	2.1	151,591	2.0	-3.12	-4,890	-0.47	-740	155,741
Local Government	616,131	8.1	601,895	8.0	-2.31	-14,236	-3.43	-21,147	594,984
Total Employment	**7,566,816**	**100.0**	**7,507,203**	**100.0**	**-0.79**	**-59,613**	**1.55**	**117,037**	**7,683,853**

Table 6-A: Illinois Employment Growth, 2008-2013

1 Share: The percentage share of total employment by industry.
2 Standardized Growth: at the same rate as its counterpart at the national level had each industry grown.
3 Standardized Employment, 2013: The 2013 level of employment in each industry had it grown at the same rate as its counterparts at the national level since 2008.

Note: Percent growth figures may not add due to rounding by a factor of ± 0.01%

Source: Calculations by the United States Regional Economic Analysis Project (US-REAP) with data provided by the U.S. Department of Commerce, Bureau of Economic Analysis

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The Actual Growth columns in the table report the percent and net change in the total number of jobs for each industry category. The table shows that over 2008-2013 a net total of **-59,613** jobs were trimmed from the Illinois economy, amounting to a decline of **- 0.79%**. That means that the state would have "grown" almost 60,000 jobs had its economy simply performed as well as the nation as a whole.

The standardized percent and net growth numbers reported in the table are hypothetical in nature, as they posit the changes in Illinois employment that would have occurred over 2008-2013 had each industry grown at the same rate as its national counterpart. The standardized "percent" growth column identifies the growth rate for each industry nationally, while the standardized "net" growth column simulates the resulting net changes in employment locally. The data not only allow one to directly compare local with national industry employment growth rates, they also translate national industry growth rates into hypothetically comparable changes in employment locally.

Although the standardized percent change reported for each industry identifies industry growth rates nationally, it should be noted that the "TOTAL" standardized percent change of **1.55%** was greater than the growth rate for total employment nationally of **1.47%**. This arises because the proportional industry distribution or mix of employment in Illinois was slightly tilted toward faster growing industries. In other words, simply by virtue of its industry mix, Illinois was disposed toward experiencing slightly better employment growth than the nation at large over 2008-2013.

Table 6-B: Illinois Shift-Share Components, 2008-2013						
	National Growth[4]		Industry Mix[5]		Region Shift[6]	
Major Industry	**Percent**	**Net**	**Percent**	**Net**	**Percent**	**Net**
Farm Employment	1.47	1,144	-1.66	-1,292	-7.66	-5,976
Forestry, Fishing, and Related Activities	1.47	175	3.85	461	-2.04	-244
Mining	1.47	340	31.10	7,214	-6.57	-1,523
Utilities	1.47	362	-4.76	-1,177	3.35	827
Construction	1.47	5,694	-16.03	-62,307	-5.83	-22,653
Manufacturing	1.47	9,907	-10.29	-69,546	-2.32	-15,687
Wholesale Trade	1.47	4,835	-4.32	-14,241	-0.49	-1,617
Retail Trade	1.47	10,877	-2.75	-20,394	-3.07	-22,825
Transportation and Warehousing	1.47	4,471	1.15	3,516	2.59	7,896
Information	1.47	1,980	-8.84	-11,944	-5.46	-7,372
Finance and Insurance	1.47	6,958	6.86	32,565	-3.49	-16,558
Real Estate and Rental and Leasing	1.47	4,136	2.20	6,200	-4.96	-14,006
Professional, Scientific, and Technical Services	1.47	7,763	1.07	5,677	-1.38	-7,286
Management of Companies and Enterprises	1.47	1,514	7.70	7,955	-3.24	-3,347
Administrative and Waste Services	1.47	7,381	3.60	18,146	-0.78	-3,925
Educational Services	1.47	2,644	8.34	15,054	2.33	4,208
Health Care and Social Assistance	1.47	11,698	10.04	80,188	-3.99	-31,819
Arts, Entertainment, and Recreation	1.47	2,178	6.85	10,176	-3.23	-4,796
Accommodation and Food Services	1.47	7,037	4.72	22,653	-3.19	-15,341
Other Services (except Public Administration)	1.47	6,467	3.02	13,339	-1.55	-6,845
Federal Civilian	1.47	1,281	-1.22	-1,064	-7.32	-6,398
Military	1.47	711	-3.73	-1,809	-8.49	-4,124
State Government	1.47	2,293	-1.94	-3,033	-2.65	-4,150
Local Government	1.47	9,028	-4.90	-30,175	1.12	6,911
Total Employment	**1.47**	**110,874**	**0.08**	**6,163**	**-2.33**	**-176,650**

4 National Growth: The change in local employment that would have occurred for a specific industry had it grown at the national growth rate of all industries combined.
5 Industry Mix: The additional gain (or loss) in local employment that would have occurred for a specific industry (additional to the national growth effect) due to the industry growing faster (or slower) nationally than the rate of all industries combined.
6 Regional Shift: The additional gain (or loss) in local employment for a specific industry beyond the national growth and industry mix effects resulting from the industry growing faster (or slower) than the same industry nationally.

Note: Percent growth figures may not add due to rounding by a factor of ± 0.01%.

Source: Calculations by the United States Regional Economic Analysis Project (US-REAP)
with data provided by the U.S. Department of Commerce, Bureau of Economic Analysis

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The underlying purpose of shift-share analysis is to perform a numerical sort on the data that offers a construct for describing two key differences between the growth of employment in Illinois and the nation at-large. As with the counties, the objective was to answer two different but interrelated questions. First, did the difference in employment growth arise because of initial dissimilarities in the industry composition of employment? Or, second, did the difference arise because of disparities in the performance of the state's industries in contrast with their national counterparts?

As with the previous "B" tables, Table 6-B, above, contains the crux of the shift-share results for the state. As with the analysis of the four counties, differences between the extent and composition of state employment growth in comparison to the nation are broken down into three hypothetical components: national growth, industry mix, and regional shift. Each component attempts to account for a separate aspect of the disparity between the overall growths of employment in Illinois vs. nationally over 2008-2013.

The National Growth component is the most straightforward, calibrating the growth in Illinois employment that may be attributed to overall national conditions and trends. If the industry composition and growth of employment had been the same for the state as it was for the nation, then Illinois' employment growth over 2008-2013 would have matched the overall national rate of **1.47%**. Instead it was **– 0.79%.**

As with the counties, the industry mix component seeks to address and answer the question: "Did Illinois employment change of **-0.79%** lag the overall national average (**1.47%**) because employment was more concentrated toward slower growing industries when compared to the nation?"

The results are derived by multiplying state employment in each sector for 2008 by the difference between the national growth rate for each sector and the total national employment growth rate (**1.47%**). The industry mix results report positive values for those industries that experienced employment growth above the **1.47%** national average, while negative values are posted for those industries that grew at rates less than **1.47%**.

The most crucial result from the industry mix calculation is the "TOTAL" derived from summing over all industries. The positive value **(0.08)** reported – even though small -- reveals that the industry composition employment for Illinois was tilted only slightly toward faster growing industries. Negative results would have indicated just the opposite.

The third shift-share component, tagged Regional Shift, computes the gain (or loss) in state employment from an industry growing faster (or slower) than the same industry nationally. When employment in a local industry grows faster (or declines less) than its counterpart nationally, there occurs a positive "shift" in the net "share" of national employment captured by that industry within the state. The "TOTAL" reported for the regional-shift component is **-176,650**, showing that Illinois employment slipped an additional **-2.33%** because a larger proportion of industries grew more slowly than was the case at the national level.

As with the four counties, shift-share analysis provides a framework for describing the growth of state employment relative to the nation at large. Results for Illinois may be highlighted as follows:

Actual Growth   National Growth   Industry Mix   Regional Shift
-0.79%*(-59,613) =   1.47%(110,874)   + 0.08%(6,163) + -2.33%(-176,650)
*Percent growth figures may not add due to rounding by a factor of ± 0.01%.

Note that the shift-share identity can be rearranged to focus on identifying the difference between state (actual) and national growth rates as the sum of the industry mix and regional shift components:

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Actual Growth - National Growth   Industry Mix   Regional Shift
          -2.25%*(-170,487)   = 0.08%(6,163) + -2.33%(-176,650)
Percent growth figures may not add due to rounding by a factor of ± 0.01%.

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Illinois' employment change over 2008-2013 of **-0.79**% trailed the **1.47%** growth of employment nationally by **-2.25%**. *Accounting for this difference was an industry mix marginally inclined toward industries that experienced faster growth, coupled with the fact that a large share of the state's industries underperformed their counterparts nationally.*

How then does this result compare to the results found for the four central Illinois counties? Table 7-A provides these results.

TABLE 7-A: Comparison of Employment Growth, 2008-2013, Illinois and Counties							
	Total Employment		Actual Growth		Standardized Growth		
	2008	2013	Percent	Net	Percent	Net	Employment
ILLINOIS	**7,566,816**	**7,507,203**	**-0.79**	**-59,613**	**1.55**	**117,037**	**7,683,853**
Sangamon	125,340	122,964	-1.90	-2,376	2.37	2,965	128.305
Champaign	128,346	124,403	-3.07	-3,943	1.32	1,698	130,044
McLean	113,289	111,669	-1.43	-1,620	2.63	2,984	116,273
Peoria	127,656	124,483	-2.49	-3,173	2.46	3,143	130,799
Avg. of Counties	123,408	120,880	-2.22	-2,778	2.20	2,698	126,355

Numbers above subject to rounding.

As one can see, the state as a whole performed noticeably better than did the four central Illinois counties in terms of actual growth, but less well than all but Champaign in standardized growth. This may be indicative of the fact that the shift-share analysis found that the Illinois economy was only marginally oriented toward a mix of faster growing industries, while Champaign was not. This is somewhat validated by the results for Sangamon compared to the state as a whole, as Sangamon shared the result that while it did include a mix of faster growing industries, it was less than that found for McLean and Peoria counties.

How then did the shift-share components – the National Growth, Industry Mix, and Regional effects – contribute to the state results when compared to the results for the four central Illinois counties? Table 7-B, below, is instructive.

The table shows that Industry Mix affected the state only marginally, at 0.08%. This difference may even be within the range of data error. In this regard the state's mix of faster and slower growing industries may be viewed as quite similar to the nation as a whole.

A regional effect for the state was found, however it was significantly less than that identified for the four counties studied. While the four counties show regional effects at or above a negative 4.0%, the contribution of regional effect to the state shift-share was only a negative 2.33%.

| TABLE 7-B: Comparison of Shift-Share Components, 2008-2013						
	National Growth Effect		Industry Mix Effect		Regional Effect	
	Percent National Growth	Net Growth Total	Percent	Net	Percent	Shift Net
ILLINOIS	**1.47**	**110,874**	**0.08**	**6,183**	**-2.33**	**-176,650**
Sangamon	1.47	1,837	0.90	1,128	-4.26	-5,341
Champaign	1.47	1,881	-0.14	-183	-4.40	-5,641
McLean	1.47	1,660	1.17	1,324	-4.06	-4,604
Peoria	1.47	1,871	1.00	1,273	-4.95	-6,316
Avg. of Counties	1.47	1,813	.733	885.5	-4.42	-5,476

Numbers above subject to rounding.

All-in-all this leaves us to believe that while some of the regional effect for the four counties may be due to forces unique to central Illinois, they are less affected by the larger state economy.

For the Sangamon economic region it would now be prudent to conduct additional analysis comparing these results on an industry-sector by industry-sector basis. That would provide a deeper understanding of how individual sectors in the regional economy performed vis-à-vis similar counties.

Other SSCRPC studies discussed in this report are available in the Information Center on the Commission's Website: WWW.SSCRPC.COM.
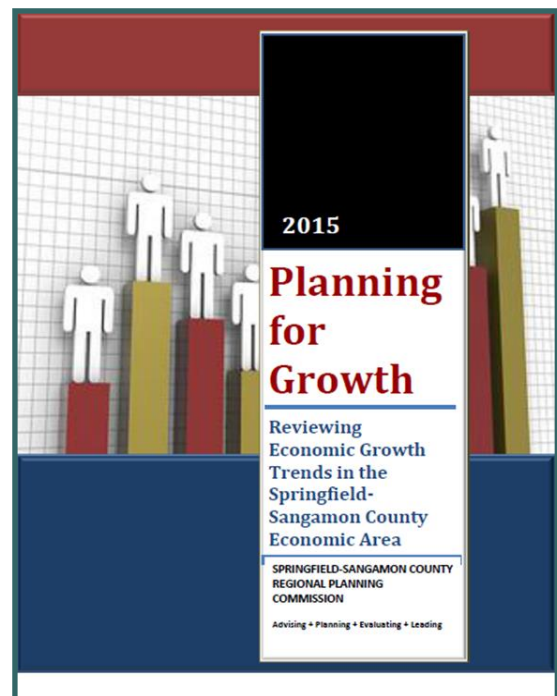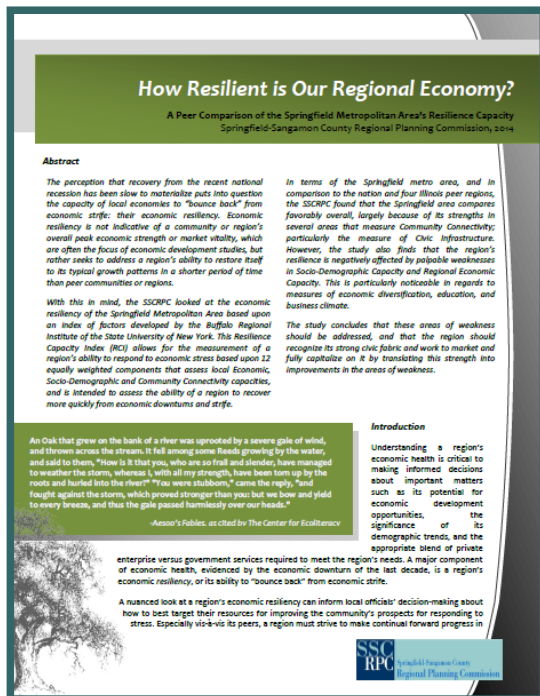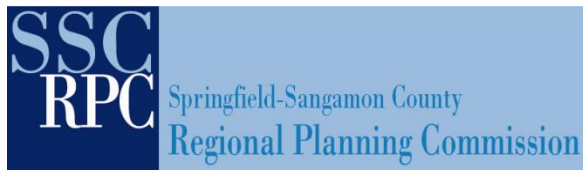
The Springfield-Sangamon County Regional Planning Commission (SSCRPC) serves as the joint planning body for Sangamon County and the City of Springfield, as well as the Metropolitan Planning Organization for transportation planning in the region.

The Commission works with other public and non-profit agencies throughout the area to promote orderly growth and redevelopment, and assists other Sangamon County communities with their planning needs. Through its professional staff, the SSCRPC its research, analytic and planning expertise to bear on such important matters as land use, housing, recreation, transportation, economic development, hazard mitigation and environmental protection.

Along with studies such as this one, the SSCRPC produces many reports and other publications of regional and community interest. These can be found on the Commission's website.

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