

ECONOMIC ACTIVITY IN ARKANSAS: 2009-2014

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Abstract—

This paper is a continuation follow-up on the performance of the Arkansas economy after the last recession. The period of analysis is 2009-2014. The paper uses shift-share analysis to compare Arkansas with the United States and the Southeast Region.

I. INTRODUCTION

A good measure of economic activity is personal income which is the choice for this paper. Personal income includes income from all sources including government transfers to individuals. According to the U.S. Bureau of Economic Analysis, “personal income consists of the income of individuals, nonprofit institutions serving individuals, private noninsured welfare funds, and private trust funds,” (BEA, p. I-6) and its estimates are compiled from a variety of sources, including census data, government programs, and surveys of both the recipients and payers of the income (BEA, p. I-8).

The method of analysis used is shift-share which allows the comparison of a large entity with a smaller entity. In this paper, three comparisons will be presented: (1) United States (US) versus Arkansas (AR), (2) Southeast Region (SE) versus Arkansas (AR), and (3) United States (US) versus the Southeast Region (SE).

The early use of the shift-share technique was in regional studies [Creamer (1943) Fuchs (1959) and Dunn (1960)] of employment change. In response to critiques such as Houston (1967) and defenses such as Ashby (1968), some modifications have been suggested [Barff and Knight (1988)], but the basic approach used in this paper is mainstream [Buck (1970)]. Much of the following description is due to Rice and Horton (2012).

The technique is particularly useful as it allows for a direct comparison between two entities: the whole and the part. Three geographical comparisons are appropriate for Arkansas: United States versus Arkansas, United States versus the Southeast Region, and Southeast Region versus Arkansas. In the United States versus Arkansas comparison, Arkansas is the smaller entity (the part) and the United States is the larger entity (the whole). In the United States versus Southeast Region comparison, the Southeast is the smaller entity (the part) and the United States is the larger entity (the whole). In the Southeast Region versus Arkansas comparison, Arkansas is the smaller entity (the part) and the Southeast is the larger entity (the whole). Regardless of which comparison is made, the shift-share technique partitions the aggregate change of the smaller entity into three distinct components: (1) overall-growth share (OGS), (2) the differential-compositional component (DCS), and (3) the sector-competitive share (SCS).

Each of these components contributes a particular portion of the total change in the smaller entity (hereafter referred to as the part (e.g. Arkansas) versus the whole such as the United States). The three components are discussed in detail in the following paragraphs.

The first component, the overall-growth share (OGS), focuses on computing the overall percentage change in the whole and using this percentage change to calculate an increase or decrease in each individual sector of the part. Then, this change in each individual sector of the part represents the increase or decrease (e.g. in personal income) that would have occurred if each sector of the part had changed at the same overall rate of the whole (e.g. the United States).

The second component, the differential-compositional share (DCS), focuses on comparing

the percentage change of each individual sector of the part with the overall percentage change of the whole. If the percentage change of a sector of the part (e.g. Construction in Arkansas) exceeds the overall percentage change of the whole (e.g. the United States), the DCS component is positive and the sector of the part is considered to be a fast-growth sector. However, if the percentage change of the sector of the part is less than the overall percentage change of the whole, then the DCS component is negative, and the sector of the part is labeled a slow-growth sector.

The third component, the sector-competitive share (SCS), focuses on how the percentage change in each sector of the part compares with the percentage change of the corresponding sector of the whole. When the percentage change of the sector of the part is larger than the percentage change of the corresponding sector of the whole, the SCS component will be positive. Accordingly, a positive SCS component identifies a sector of the part as a high-performing sector relative to the corresponding sector of the whole. Conversely, a negative SCS component for a sector of the part identifies this sector of the part as an underperforming sector relative to the corresponding sector of the whole.

After calculating each component for each sector of the part, the three components are added together such that:

$$\text{Total change (sector)} = \text{OGS} + \text{DCS} + \text{SCS}$$

$$\text{Total change (part)} = \Sigma (\text{OGS}) + \Sigma (\text{DCS}) + \Sigma (\text{SCS})$$

II. ANALYSIS

The 2009 and 2014 personal income data for the United States, the Southeast Region (which contains the states of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia) and Arkansas are presented in Table 1. These data are obtained from the Regional Economic Accounts of the U.S. Bureau of Economic Analysis website: <http://www.bea.gov/regional>.

Table 1
Personal Income (millions of dollars)
United States, Southeast Region, Arkansas, 2009 and 2014

	United States		Southeast		Arkansas	
	2009	2014	2009	2014	2009	2014
Industry						
Farm	65,531	98,268	12,816	18,975	1,390	2,074
Forestry/Fishing	22,987	36,752	5,810	8,591	423	662
Mining	90,090	179,507	14,683	20,523	765	1,031
Utilities	71,966	83,966	14,893	16,770	707	915
Construction	492,669	603,982	113,260	131,677	3,566	4,060
Durable Goods	545,419	650,283	103,653	124,437	4,134	4,647
Nondurable Goods	322,258	367,174	77,970	85,767	3,870	4,261
Wholesale Trade	441,755	537,484	96,234	114,261	3,218	3,693
Retail Trade	533,708	635,700	128,963	152,092	4,240	5,079
Transportation	282,772	358,479	68,494	85,479	3,033	3,662
Information	295,456	350,157	50,419	55,059	1,481	1,062
Finance/Insurance	628,689	753,824	110,789	139,071	2,425	2,844
Real Estate	136,276	223,142	29,369	45,948	992	1,195
Professional Services	849,742	1,060,781	171,801	207,692	2,963	3,489
Management	209,360	281,464	42,579	54,510	2,596	3,864
Administrative	329,827	430,972	79,327	103,979	1,708	2,261
Education	144,865	178,612	25,344	30,559	485	585
Healthcare	967,548	1,155,041	213,777	254,646	7,238	8,474
Arts/Entertainment	93,481	117,673	20,473	25,190	255	305
Accommodations	259,815	334,621	62,515	79,975	1,596	1,953
Other Services	322,739	392,693	74,992	91,543	2,252	2,795
Governments	1,644,590	1,750,286	393,958	411,534	11,678	12,295
Adjustment for residence	3,019	3,556	13,548	17,317	-257	-201
Dividends, Interest, Rent	2,141,879	2,760,568	515,670	647,415	16,311	23,268
Transfer Receipts	2,140,155	2,523,066	545,039	655,794	21,950	26,256
less Social Security	962,858	1,159,472	216,353	255,593	7,393	8,546
Total	12,073,738	14,708,582	2,770,024	3,323,210	91,625	111,984

Aggregate Change Table 2 shows the overall percentage change and the average annual percentage change in personal income from 2009 to 2014. During this period, the Arkansas percentages (22.22 and 4.09) slightly exceeded the US percentages (21.82 and 4.03). Both US and Arkansas percentages noticeably exceeded Southeast Region percentages (19.97 and 3.71). These results suggest that Arkansas has matched the United States recovery while the Southeast Region recovery has been at a slower pace.

Table 2
Percentage Change in Personal Income
2009-2014

	Personal Income (millions of dollars)		Overall Percentage Change	Average Annual Percentage Change
	2009	2014		
United States	12,073,738	14,708,582	21.82	4.03
Southeast Region	2,770,024	3,323,210	19.97	3.71
Arkansas	91,625	111,984	22.22	4.09

The last four columns of Tables 3, 4, and 5 (labeled separately as Tables 3b, 4b, and 5b) present the shift-share information. The aggregate-change analysis focuses on the bottom row (total) of these three tables. The Total column (column 10) identifies the personal income changes that occurred in the period 2009-2014. The other three columns represent a partitioning of this total change into three components.

The first component, the overall-growth column, presents the total change in personal income that results if each sector of the smaller entity (e.g. Arkansas) grew at the same percentage as the larger entity (e.g. the United States). The second component, the differential-composition column, represents the sum of the individual sector change (increase or decrease) that would occur when the individual sector percentage change is compared to the larger entity overall percentage change. A positive differential-composition result indicates fast growth and a negative differential-composition result indicates slow growth. The third component, the sector-competitive column, is the result of comparing the smaller entity percentage change with the percentage change of the larger entity on a sector-by-sector basis. A positive/negative difference indicates that the smaller entity is outperforming/not outperforming the corresponding sector of the larger entity. A summary of the Total row from Tables from Tables 3b, 4b, and 5b is presented in Table 6.

Table 3a
Personal Income (2009-2014)
United States vs. Arkansas
(millions of dollars for columns 1 – 4 and percentage of total for columns 5 and 6)

	1	2	3	4	5	6
Industry	US 2009	US 2014	AR 2009	AR 2014	% US	% AR
Farm	65,531	98,268	1,390	2,074	1.4996	1.4919
Forestry/Fishing	22,987	36,752	423	662	1.5988	1.5637
Mining	90,090	179,507	765	1,031	1.9925	1.3486
Utilities	71,966	83,966	707	915	1.1667	1.295
Construction	492,669	603,982	3,566	4,060	1.2259	1.1387
Durable Goods	545,419	650,283	4,134	4,647	1.1923	1.1242
Nondurables Goods	322,258	367,174	3,870	4,261	1.1394	1.1012
Wholesale Trade	441,755	537,484	3,218	3,693	1.2167	1.1476
Retail Trade	533,708	635,700	4,240	5,079	1.1911	1.1978
Transportation	282,772	358,479	3,033	3,662	1.2677	1.2073
Information	295,456	350,157	1,481	1,062	1.1851	0.7174
Finance/ Insurance	628,689	753,824	2,425	2,844	1.199	1.1725
Real Estate	136,276	223,142	992	1,195	1.6374	1.2047
Professional Services	849,742	1,060,781	2,963	3,489	1.2484	1.1776
Management	209,360	281,464	2,596	3,864	1.3444	1.4881
Administrative	329,827	430,972	1,708	2,261	1.3067	1.3231
Education	144,865	178,612	485	585	1.233	1.2064
Healthcare	967,548	1,155,041	7,238	8,474	1.1938	1.1708
Arts/ Entertainment	93,481	117,673	255	305	1.2588	1.192
Accommodations	259,815	334,621	1,596	1,953	1.2879	1.2238
Other Services	322,739	392,693	2,252	2,795	1.2168	1.2412
Governments	1,644,590	1,750,286	11,678	12,295	1.0643	1.0528
Adjustment for residence	3,019	3,556	-257	-201	1.178	0.78
Dividends, Interest, Rent	2,141,879	2,760,568	16,311	23,268	1.2889	1.4266
Transfer Receipts	2,140,155	2,523,066	21,950	26,256	1.1789	1.1962
less Social Security Contributions	962,858	1,159,472	7,393	8,546	1.2042	1.1559
Total	12,073,738	14,708,582	91,625	111,984	1.2182	1.2222

Table 3b
Shift-Share Results by Industry (2009-2014)
United States vs. Arkansas
(millions of dollars)

	7	8	9	10
Industry	Overall Growth	Differential-Composition	Factor-Competit	Total Change
Farm	303	391	-11	684
Forestry/Fishing	92	161	-15	239
Mining	167	592	-492	267
Utilities	154	-36	91	208
Construction	778	27	-311	495
Durable Goods	902	-107	-281	513
Nondurables Goods	844	-305	-148	392
Wholesale Trade	702	-5	-222	475
Retail Trade	925	-115	28	839
Transportation	662	150	-183	629
Information	323	-49	-693	-419
Finance/Insurance	529	-47	-64	418
Real Estate	216	416	-429	203
Professional Services	647	89	-210	526
Management	567	328	373	1,267
Administrative	373	151	28	552
Education	106	7	-13	100
Healthcare	1,579	-177	-166	1,236
Arts/ Entertainment	56	10	-17	49
Accommodations	348	111	-102	357
Other Services	491	-3	55	543
Governments	2,549	-1,798	-134	617
Adjustment for residence	-56	10	102	57
Dividends, Interest, Rent	3,559	1,152	2,246	6,958
Transfer Receipts	4,790	-863	379	4,306
less Social Security Contributions	1,613	-104	-357	1,153
Total	19,995	195	168	20,358

Table 4a
Personal Income (2009-2014)
Southeast Region vs. Arkansas
(millions of dollars for columns 1 – 4 and percentage of total for columns 5 and 6)

	1	2	3	4	5	6
Industry	SE 2009	SE 2014	AR 2009	AR 2014	% SE	% AR
Farm	12,816	18,975	1,390	2,074	1.4806	1.4919
Forestry/Fishing	5,810	8,591	423	662	1.4787	1.5637
Mining	14,683	20,523	765	1,031	1.3978	1.3486
Utilities	14,893	16,770	707	915	1.126	1.295
Construction	113,260	131,677	3,566	4,060	1.1626	1.1387
Durable Goods	103,653	124,437	4,134	4,647	1.2005	1.1242
Nondurables Goods	77,970	85,767	3,870	4,261	1.1	1.1012
Wholesale Trade	96,234	114,261	3,218	3,693	1.1873	1.1476
Retail Trade	128,963	152,092	4,240	5,079	1.1793	1.1978
Transportation	68,494	85,479	3,033	3,662	1.248	1.2073
Information	50,419	55,059	1,481	1,062	1.092	0.7174
Finance/Insurance	110,789	139,071	2,425	2,844	1.2553	1.1725
Real Estate	29,369	45,948	992	1,195	1.5645	1.2047
Professional Services	171,801	207,692	2,963	3,489	1.2089	1.1776
Management	42,579	54,510	2,596	3,864	1.2802	1.4881
Administrative	79,327	103,979	1,708	2,261	1.3108	1.3231
Education	25,344	30,559	485	585	1.2058	1.2064
Healthcare	213,777	254,646	7,238	8,474	1.1912	1.1708
Arts/ Entertainment	20,473	25,190	255	305	1.2304	1.192
Accommodations	62,515	79,975	1,596	1,953	1.2793	1.2238
Other Services	74,992	91,543	2,252	2,795	1.2207	1.2412
Governments	393,958	411,534	11,678	12,295	1.0446	1.0528
Adjustment for residence	13,548	17,317	-257	-201	1.2782	0.78
Dividends, Interest, Rent	515,670	647,415	16,311	23,268	1.2555	1.4266
Transfer Receipts	545,039	655,794	21,950	26,256	1.2032	1.1962
less Social Security Contributions	216,353	255,593	7,393	8,546	1.1814	1.1559
Total	2,770,024	3,323,210	91,625	111,984	1.1997	1.2222

Table 4b
Shift-Share Results by Industry (2009-2014)
Southeast Region vs. Arkansas
(millions of dollars)

	7	8	9	10
Industry	Overall Growth	Differential-Composition	Sector-Competitive	Total Change
Farm	278	391	16	684
Forestry/Fishing	85	118	36	239
Mining	153	152	-38	267
Utilities	141	-52	119	208
Construction	712	-132	-85	495
Durable Goods	826	3	-315	513
Nondurables Goods	773	-386	5	392
Wholesale Trade	643	-40	-128	475
Retail Trade	847	-86	78	839
Transportation	606	146	-123	629
Information	296	-159	-555	-419
Finance/Insurance	484	135	-201	418
Real Estate	198	362	-357	203
Professional Services	592	27	-93	526
Management	519	209	540	1,267
Administrative	341	190	21	552
Education	97	3	0	100
Healthcare	1,445	-62	-147	1,236
Arts/Entertainment	51	8	-10	49
Accommodations	319	127	-89	357
Other Services	450	47	46	543
Governments	2,332	-1,811	96	617
Adjustment for residence	-51	-20	128	57
Dividends, Interest, Rent	3,257	910	2,791	6,958
Transfer Receipts	4,383	77	-154	4,306
less Social Security Contributions	1,476	-136	-188	1,153
Total	18,298	291	1,770	20,358

Table 5a
Personal Income (2009-2014)
United States vs. Southeast Region
(millions of dollars for columns 1 – 4 and percentage of total for columns 5 and 6)

	1	2	3	4	5	6
Industry	US 2009	US 2014	SE 2009	SE 2014	% US	% SE
Farm	65,531	98,268	12,816	18,975	1.4996	1.4806
Forestry/Fishing	22,987	36,752	5,810	8,591	1.5988	1.4787
Mining	90,090	179,507	14,683	20,523	1.9925	1.3978
Utilities	71,966	83,966	14,893	16,770	1.1667	1.126
Construction	492,669	603,982	113,260	131,677	1.2259	1.1626
Durable Goods	545,419	650,283	103,653	124,437	1.1923	1.2005
Nondurables Goods	322,258	367,174	77,970	85,767	1.1394	1.1
Wholesale Trade	441,755	537,484	96,234	114,261	1.2167	1.1873
Retail Trade	533,708	635,700	128,963	152,092	1.1911	1.1793
Transportation	282,772	358,479	68,494	85,479	1.2677	1.248
Information	295,456	350,157	50,419	55,059	1.1851	1.092
Finance/Insurance	628,689	753,824	110,789	139,071	1.199	1.2553
Real Estate	136,276	223,142	29,369	45,948	1.6374	1.5645
Professional Services	849,742	1,060,781	171,801	207,692	1.2484	1.2089
Management	209,360	281,464	42,579	54,510	1.3444	1.2802
Administrative	329,827	430,972	79,327	103,979	1.3067	1.3108
Education	144,865	178,612	25,344	30,559	1.233	1.2058
Healthcare	967,548	1,155,041	213,777	254,646	1.1938	1.1912
Arts/Entertainment	93,481	117,673	20,473	25,190	1.2588	1.2304
Accommodations	259,815	334,621	62,515	79,975	1.2879	1.2793
Other Services	322,739	392,693	74,992	91,543	1.2168	1.2207
Governments	1,644,590	1,750,286	393,958	411,534	1.0643	1.0446
Adjustment for residence	3,019	3,556	13,548	17,317	1.178	1.2782
Dividends, Interest, Rent	2,141,879	2,760,568	515,670	647,415	1.2889	1.2555
Transfer Receipts	2,140,155	2,523,066	545,039	655,794	1.1789	1.2032
less Social Security Contributions	962,858	1,159,472	216,353	255,593	1.2042	1.1814
Total	12,073,738	14,708,582	2,770,024	3,323,210	1.2182	1.1997

Table 5b
Shift-Share Results by Industry (2009-2014)
United States vs. Southeast Region
 (millions of dollars)

	7	8	9	10
Industry	Overall Growth	Differential-Composition	Sector-Competitive	Total Change
Farm	2,797	3,605	-243	6,159
Forestry/Fishing	1,268	2,211	-698	2,781
Mining	3,204	11,369	-8,732	5,841
Utilities	3,250	-767	-607	1,876
Construction	24,717	873	-7,172	18,418
Durable Goods	22,620	-2,691	856	20,784
Nondurables Goods	17,015	-6,148	-3,071	7,797
Wholesale Trade	21,001	-147	-2,827	18,027
Retail Trade	28,144	-3,499	-1,517	23,128
Transportation	14,947	3,391	-1,353	16,985
Information	11,003	-1,668	-4,694	4,640
Finance/Insurance	24,177	-2,126	6,230	28,281
Real Estate	6,409	12,311	-2,142	16,578
Professional Services	37,492	5,176	-6,777	35,891
Management	9,292	5,372	-2,734	11,931
Administrative	17,312	7,015	326	24,652
Education	5,531	373	-688	5,216
Healthcare	46,652	-5,226	-557	40,869
Arts/Entertainment	4,468	831	-582	4,716
Accommodations	13,643	4,357	-539	17,460
Other Services	16,365	-111	296	16,551
Governments	85,973	-60,654	-7,744	17,575
Adjustment for residence	2,957	-545	1,357	3,769
Dividends, Interest, Rent	112,534	36,419	-17,208	131,745
Transfer Receipts less Social Security Contributions	118,943	-21,427	13,238	110,755
Total	604,500	-8,669	-42,645	553,186

Table 6
Summary of Shift-Share Analysis: 2009-2014
Personal Income: Millions of dollars and Percentages (in bold)

	Overall-Growth	Differential-Compositional	Sector-Competitive	Total
United States vs. Arkansas	19,995	195	168	20,358
	98.20%	1%	0.80%	100%
United States vs. Southeast Region	604,500	-8,669	-42,645	553,186
	109.30%	-1.60%	-7.70%	100%
Southeast Region vs. Arkansas	18,298	291	1,770	20,358
	89.90%	1.40%	8.70%	100%

From the last column of Table 6, it can be seen that the total increase in Arkansas personal income from 2009-2014 is \$20,358 million. Examination of the

United States vs. Arkansas row (row 1 of Table 6) indicates this total increase is divided as follows: (1) overall-growth component of \$19,995 million (98.2%), (2) differential-compositional component of \$195 million (1%), and (3) a sector-competitive component of \$168 million (0.8%). The positive overall-growth component, which is the major part of the increase, indicates the personal income increase in Arkansas that would have occurred if the Arkansas percentage were the same as the percentage increase in the United States. The positive (\$195 million) differential-compositional component, although it is relatively small, shows that the aggregate industry mix of Arkansas was a combination of fast-growth sectors. Also, the positive (\$168 million) sector-competitive component shows that the aggregate effect, though small, of the combined sectors of Arkansas are slightly more competitive when compared to the United States.

The second Arkansas comparison, Southeast vs. Arkansas, is in row 3 of Table 6. The three components are: (1) an overall-growth component of \$18,298 million (89.9%), (2) a differential-compositional component of \$291 million (1.4%), and (3) a sector-competitive component of \$1,770 million (8.7%). To some extent, these results are similar to the United States vs. Arkansas comparison in that the overall-growth component is the major driver of the change in Arkansas personal income with both the differential-compositional and sector-competitive components being positive. The noticeable difference in the two comparisons is in the sector-competitive component which represents 8.7% of Arkansas personal income growth when compared to the Southeast Region and slightly less than the one percent (0.8%) when compared to the United States. Thus, on an aggregate basis, many Arkansas sectors are noticeably outperforming the corresponding Southeast Region sectors.

The third comparison, United States vs. Southeast, is in row two of Table 6. In row two, a large positive overall-growth component of \$604,500 million (109.3%) is combined with a negative differential-compositional component of -\$8,669 million (-1.6%) and a large, negative, sector-competitive component of -\$42,645 million (-7.7%). These two negative components suggest

that, on the aggregate, the Southeast Region is lagging behind the slow, but positive, recovery that is taking place in the United States.

In addition to the previous analysis, an examination of the same period of time (2002-2007) prior to the 2008 economic downturn was performed and is presented in Table 7. Table 7 presents the data for the period 2002-2007 in the same format as Table 2 which is for period 2009-2014.

Table 7
Percentage Change in Personal Income
2002-2007

	Personal Income (millions of dollars)		Overall Percentage Change	Average Annual Percentage Change
	2002	2007		
United States	9,146,428	11,990,104	31.09	5.56
Southeast Region	2,049,526	2,752,627	34.31	6.08
Arkansas	65,649	88,847	35.34	6.24

Comparing Table 2 with Table 7, it is noted that all percentages in Table 7 are greater than the corresponding Table 2 values. In particular, it is observed that for the earlier period, 2002-2007 (Table 7), the overall percentage changes range in the low-to-mid 30s and the average annual percentage changes all exceed 5.5% with the largest being Arkansas (6.24%). Correspondingly, in the latest period of 2009-2014 (Table 2), the overall percentage changes are primarily in the low 20 percent range and the average annual percentage changes are around or less than 4 percent. Thus, it is clear that the post-2008 economic recovery is noticeably below the pre-2008 period.

A summary of the aggregate analysis section is as follows:

1. During the period, 2009-2014, personal income in the United States increased 21.82% at an average annual percentage change of 4.03% (Table 2).
2. During the period, 2009-2014, personal income in Arkansas increased 22.22% at an average annual percentage change of 4.09% (Table 2). These

changes essentially matched the growth in the United States. Also, from Table 6, it is noted that when compared to the United States, Arkansas aggregate personal income increase was primarily determined by the overall-growth component aided by small, positive, contributions from both the differential-compositional and sector-competitive components. On the other hand, when Arkansas is compared to the Southeast Region (Table 6), Arkansas is clearly outperforming the region led by a large, positive, sector-competitive component.

3. During the period, 2009-2014, personal income in the Southeast Region increased 19.97% at an average annual rate of 3.71% (Table 2). Both of the percentages are lower than the corresponding percentage for the United States and Arkansas.

4. A comparison of time periods of the same length [2002-2007 (pre-recession) and 2009-2014 (post-recession)] indicated that the pre-recession economic growth was significantly greater than the post-recession economic growth (Tables 2 and 7). Thus, the recovery is still considered to be at a slow pace.

III. SECTOR ANALYSIS

This section will focus on the sectors in Arkansas that produce at least 3.5% of Arkansas personal income. Table 8 provides the percentage contribution to personal income for each sector in the United States, the Southeast Region, and Arkansas.

From Table 8, the top eight sectors producing Arkansas personal income in 2014 were identified and are presented below with the direction of movement between 2009 and 2014 indicated by the appropriate up or down arrow. Additionally, for comparison, the corresponding percentages for 2009 are provided in bold type after the arrow.

Transfer Receipts	(23.45%) ↓ (23.96%)
Dividends, Interest, and Rents	(20.78%) ↑ (17.80%)
Governments	(10.98%) ↓ (12.75%)
Healthcare and Social Assistance	(7.57%) ↓ (7.90%)
Retail Trade	(4.54%) ↓ (4.63%)
Durable Goods Manufacturing	(4.15%) ↓ (4.51%)
Nondurable Goods Manufacturing	(3.81%) ↓ (4.22%)
Construction	(3.63%) ↓ (3.89%)

These eight sectors account for 78.91 percent of Arkansas personal income in 2014 and 79.66 percent in 2009. Of note is the fact that seven of the eight arrows point down, indicating that the only sector that improved in the period 2009-2014 was Dividends, Interest, and Rent.

Table 9 is helpful in explaining the downward trends in percentage contribution to total personal income in Arkansas in seven of the eight major producing sectors in 2014. The downward trend has been fairly steady since 2009.

In Table 9, there are sixteen shift-share entries for US vs. Arkansas comparisons and sixteen for Southeast Region vs. Arkansas comparisons. Of these thirty-two entries, over half (21) are negative. Additionally, only three sectors (Transfer Receipts, Dividends, Interest, and Rent, and Retail Trade) have at least two positive values. As one might expect, two of these sectors are the largest providers of Arkansas personal income.

Table 8
Percentage of Personal Income by Sector

Industry	US		SE		AR	
	2009	2014	2009	2014	2009	2014
Farm	0.54	0.67	0.46	0.57	1.52	1.85
Forestry/Fishing	0.19	0.25	0.21	0.26	0.46	0.59
Mining	0.75	1.22	0.53	0.62	0.83	0.92
Utilities	0.6	0.57	0.54	0.5	0.77	0.82
Construction	4.08	4.11	4.09	3.96	3.89	3.63
Durable Goods	4.52	4.42	3.74	3.74	4.51	4.15
Nondurables Goods	2.67	2.5	2.81	2.58	4.22	3.81
Wholesale Trade	3.66	3.65	3.47	3.44	3.51	3.3
Retail Trade	4.42	4.32	4.66	4.58	4.63	4.54
Transportation	2.34	2.44	2.47	2.57	3.31	3.27
Information	2.45	2.38	1.82	1.66	1.62	0.95
Finance/Insurance	5.21	5.13	4	4.18	2.65	2.54
Real Estate	1.13	1.52	1.06	1.38	1.08	1.07
Professional Services	7.04	7.21	6.2	6.25	3.23	3.12
Management	1.73	1.91	1.54	1.64	2.83	3.45
Administrative	2.73	2.93	2.86	3.13	1.86	2.02
Education	1.2	1.21	0.91	0.92	0.53	0.52
Healthcare	8.01	7.85	7.72	7.66	7.9	7.57
Arts/Entertainment	0.77	0.8	0.74	0.76	0.28	0.27
Accommodations	2.15	2.28	2.26	2.41	1.74	1.74
Other Services	2.67	2.67	2.71	2.75	2.46	2.5
Governments	13.62	11.9	14.22	12.38	12.75	10.98
Adjustment for residence	0.03	0.02	0.49	0.52	-0.28	-0.18
Dividends, Interest, Rent	17.74	18.77	18.62	19.48	17.8	20.78
Transfer Receipts	17.73	17.15	19.68	19.73	23.96	23.45
less Social Security Contributions	7.97	7.88	7.81	7.69	8.07	7.63
Total	100	100	100	100	100	100

Table 9
Selected Summary of Results

SECTOR	2014 Arkansas Percentage Contribution to Personal Income	Shift-Shares: 2009-2014 (millions of dollars)			
		United States		Southeast Regions	
		vs. Arkansas		vs. Arkansas	
		Differential-Compositional Component	Sector-Competitive Component	Differential-Compositional Component	Sector-Competitive Component
Transfer Receipts	23.45	-863	379	77	-154
Dividends, Interest, Rent	20.78	1,152	2,246	910	2,791
Governments	10.98	-1,798	-134	-1,811	96
Healthcare and Social Assistance	7.57	-177	-166	-62	-147
Retail Trade	4.54	-115	28	-86	78
Durable Goods Manufacturing	4.15	-107	-281	3	-315
Nondurable Goods Manufacturing	3.81	-305	-148	-386	5
Construction	3.63	27	-311	-132	-85

In fact, Transfer Receipts (23.45%) is noticeably the largest personal income producing sector in Arkansas. Further examination of Table 9 indicates that the Transfer Receipts sector has two positive shift-share components: (1) in the US vs. Arkansas comparison, a positive sector-competitive component (+\$379 million) and (2) in the Southeast vs. Arkansas comparison, a positive differential-compositional component (+\$77 million). This shows that the Transfer Receipts sector is a strong sector in the nation, but not as strong in the Southeast Region. During the same period, the Transfer Receipts sector was fast-growth in the region, but slow-growth in the nation. This is a mixed performance, but a better performance than in the nation and region. Referring back to Table 8, it is apparent that the 2014 percentage contributions to personal income in the Transfer Receipts sector are (1) Arkansas (23.45%), (2) Southeast Region (19.73%), and (3) United States (17.15%). This disparity is consistent with the notion that Arkansas continues to attract retirees who are the major recipients of the two major components of Transfer Receipts: social security and Medicare.

The second largest (Table 9) Arkansas personal income producing sector in 2014 was Dividends, Interest, and Rent (20.78%). Examination of the shift-share components of this sector notes that all four shift-share components are positive. This identifies the Dividends, Interest, and Rent sector as a strong sector in the state. This is a fast-growth

sector for both the US and Southeast and contributes a larger percent of Arkansas personal income (20.78%) than for either the nation (18.77%) or the region (19.48%).

Accepting the premise that Arkansas is attractive to retirees, the dividends portion of the second-largest personal income-producing sector may reflect the reasonably strong stock market gains from 2009 to 2014 (the Dow Jones Industrial Average rose from 8,331.68 to 17,055.42 from July 13 to July 14, per the closing price from the historical prices database from Yahoo finance at

<http://finance.yahoo.com/q/hp?s=%5EDJI&a=0&b=29&c=1985&d=3&e=7&f=2016&g=d&z=66&y=1650>) that resulted in improved earnings and allowed dividends and capital gains. On the other hand, interest rates remain low and are less likely to have provided much of the improvement in this sector. Not necessarily related to retirees, the rent part of the sector is a rising component since the recent housing bubble and subsequent collapse that has resulted in an increase in rentals and the costs of renting across the nation (*Arkansas Democrat Gazette*, June 25, 2015).

The third largest sector for Arkansas personal income is Governments (10.98%). Referring back to Table 8, it is noted that this percentage is less than that for 2009 (12.25%). Also, from Table 8, it is observed that the personal income from this sector declined from 2009 to 2014 for both the United States (13.62% to 11.90%) and the Southeast Region (14.22% to 12.38%). These changes are consistent with the attempts of governments at all levels to slow the growth of general expenditures, in particular the cost of labor, which have resulted in this sector becoming slow-growth as identified by a negative differential-compositional component for the nation (-\$1,798 million) and the region (-\$1,811 million) (see Table 9).

Referring to Table 9, the remaining top five sectors are: (1) Healthcare and Social Assistance (7.57%), (2) Retail Trade (4.54%), (3) Durable Goods Manufacturing (4.15%), (4) Nondurable Goods Manufacturing (3.81%), and (5) Construction (3.63%). These five sectors account for 23.7% of Arkansas 2014 personal income. This total is less

than the 2009 percentage (25.15%). Further examination of Table 9 shows that fifteen of these twenty total shift-share entries are negative. Eight of the ten differential-compositional components are negative and the only two positive components are (+\$27 million) for Construction in the US vs. Arkansas comparison and (the small +\$3 million) for Durable Goods Manufacturing in the Southeast Region vs. Arkansas comparison. The positive for construction is encouraging since construction growth typically leads an economic recovery. Of the ten sector-competitive components, seven are negative and three (+\$28 million and +\$78 million in Retail Trade and +\$5 million in Nondurable Goods Manufacturing) are positive.

The combination of these five sectors is mostly slow-growth and not sector-competitive. Consequently, for the foreseeable future, personal income growth in Arkansas will likely be slower than the growth of the comparable pre-recession period.

IV. SUMMARY

The eight major personal income producing sectors in Arkansas accounted for almost 79 percent of 2014 total personal income. These sectors were (1) Transfer Receipts (23.45%), (2) Dividends, Interest, and Rents (20.78%), (3) Governments (10.98%), (4) Healthcare and Social Assistance (7.57%), (5) Retail Trade (4.54%), (6) Durable Goods Manufacturing (4.15%), (7) Nondurable Goods Manufacturing (3.78%), and (8) Construction (3.63%).

During 2009-2014, these eight sectors led the Arkansas personal income growth of 22.22 percent for an average annual growth rate of 4.09 percent. These percentages were slightly higher than comparable figures for the United States (21.82% and 4.03%) and significantly higher for the Southeast Region (19.9% and 3.71%). While the Arkansas recovery has basically matched that of the United States, it has somewhat outpaced the recovery of the Southeast region.

These aggregate numbers were compared to a similar period of time (2002-2007) before the 2008 recession. During this period the personal income percentage increase and the average annual

percentage increase were as follows: (1) Arkansas (35.34% and 6.24%), (2) United States (31.09% and 5.56%), and (3) Southeast Region (34.31% and 6.08%). Comparison of the two time periods shows that the pre-recession period experience a larger growth level than the post-recession period. This result indicates that the post-recession recovery is markedly slower than the pre-recession growth.

Returning to the sector analysis, Transfer Receipts (23.45%) is the number one producer of personal income in Arkansas. The sector had two positive shift-share components: (1) the sector-competitive component in the United States vs. Arkansas comparison, and (2) the differential-compositional component in the Southeast Region vs. Arkansas comparison. These results suggest that the Transfer Receipts sector in Arkansas is very strong in the nation, but less strong in the region. Additionally, the results indicate that the sector is fast-growth in the region, but slow-growth in the nation. Although this is a mixed performance, the outcome has been a dominant source of personal income for the state and should continue to be strong because it contains Medicare and Social Security, which tend to be protected entitlement payments.

The number two sector, Dividends, Interest, and Rent, produces 20.78% of Arkansas personal income. The shift-share analysis indicated that all four shift-share components are positive. That is, in the US vs. Arkansas comparison, both the sector-competitive and differential-compositional components are positive. Similarly, both shift-share components are positive in the Southeast Region vs. Arkansas comparison. This means that the sector is a very competitive, fast-growth source of income when compared to both the United State and Southeast Region. Possible reasons for this strength include (1) a continuing strong period of dividends and capital gains from stock market activity, and (2) a movement from home ownership to rental.

The third highest personal income producing sector is Governments (10.98%). The shift-share results indicate only one positive component: the sector-competitive component in the Southeast Region vs. Arkansas comparison. Consequently, Governments, although third largest, has not been a particularly strong sector during the post-recession

recovery period. In fact, it is slow-growth relative to both the nation and region, which is consistent with the efforts of governments at all levels to reduce expenditures (particularly labor costs).

The remaining five largest personal income producing sectors in Arkansas in 2014 totaled 23.7% (Healthcare and Social Assistance, Retail Trade, Durable Goods Manufacturing, Nondurable Goods Manufacturing, and Construction). This total declined slightly since 2009 and seventy-five percent of the shift-share components are negative, meaning that the sectors are primarily slow-growth and non-competitive.

In summarizing the short-term future growth in Arkansas personal income, two comments seem appropriate. First, the state will likely remain attractive to retirees who will continue to contribute to personal income. However, this strength is unlikely to create much new employment. Second, the primary job-creating sectors, Durable Goods Manufacturing, Nondurable Goods Manufacturing, and Construction, have steadily declined since 2009. For noticeable improvement in employment to occur, these three sectors must grow significantly. In particular, construction, which had one positive shift-share component, needs to be more robust because this sector is usually a post-recession leader.

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