

1999 County Trade Pull Factors for the state of Oklahoma

by: Jon Chiappe, Research Analyst

Business Development Center

Southwestern Oklahoma State University

Weatherford, OK 73096

(580) 774-3095

Introduction

Retail trade not only provides sales tax revenues for state & local governments, but also employment benefits to the local community. In order to maximize the sales tax and employment benefits and therefore gain the most from retail trade, communities would need to attract shoppers from outside the community. Convenience and entertainment in the form of large shopping malls, an interstate, tourist attractions, etc. would attract people from surrounding areas, and the retail purchases that these visitors make would enhance the aforementioned benefits to the local community.

Whether or not a given county is able to attract people from outside its borders can be measured by County Trade Pull Factors. Trade pull factors are basically location quotients that compare a given county's per capita retail sales to the state's per capita retail sales. Location quotients greater than 1.00 indicate that the county's per capita retail sales are greater than the state's per capita retail sales and that the county is able to pull shoppers from surrounding regions for retail trade. Location quotients less than 1.00 indicate that the county's per capita retail sales are less than the state's per capita retail sales and that the county's residents shop in other counties for retail trade.

Assumptions

Before the County Trade Pull Factor (CTPF) model is explained, there are several assumptions associated with this location quotient that should be mentioned.

The first assumption would be that the state is self-sufficient with regard to retail sales. This would mean that Oklahomans do not spend outside the state and that people from other states do not spend in Oklahoma. This is the Robinson Crusoe assumption - meaning that the state would be viewed as an island that provides all of its retail sales for its entire population. If this assumption is too farfetched, then an alternative assumption would be that the dollar value of Oklahomans spending outside the state equaled the dollar value of non-Oklahomans spending inside the state (as long as the non-resident spending pattern replaced the resident spending pattern dollar for dollar). Either initial assumption, whether the state were self-sufficient or the dollar values equaled, would produce the same results.

The second assumption would be that the amount of money spent on retail sales by the residents of each county averaged to equal the per capita retail sales figure associated with the state. Which means that, as a group, the residents of each county spend the same amount of money on per capita retail sales as the residents of every other county in the state.

A third assumption of the model would be that per capita personal income (PCPI) is equal across counties. This means that any differences in per capita retail sales is not due to any income differences. This assumption will be relaxed later, and a modification of the model will be made.

The Model

Now that the weaknesses of the model have been presented, the basic CTPF model requires only retail sales and population information for each of the seventy-seven counties and the state as a whole. A modification of the CTPF model will require the use of per capita personal income (PCPI) for each of the counties and the state.

Total sales subject to sales tax numbers were obtained from the ORIGINS database, the population estimates were obtained from the U.S. Census Bureau, and the PCPI estimates were obtained from the REIS 1969-1998 CD-ROM.

Computing County Trade Pull Factors requires first calculating per capita retail sales for each of the seventy-seven counties and the state. And as would be expected, per capita sales requires dividing the region's total sales subject to sales tax by a population figure - in this case total non-institutionalized population. The non-institutionalized population adjusts the total population by accounting for people in prisons, mental hospitals, etc., and the rationale for this adjustment is that most of the institutionalized do not make their own purchases.¹

$$\text{Per Capita Sales} = \frac{\text{Sales Subject to Sales Tax}}{\text{non - institutionalized population}}$$

The next step in the computation of County Trade Pull Factors requires dividing per capita sales in the county by per capita sales in the state. Basically, this is a ratio with those ratios (CTPF) greater than 1.00 indicating that per capita sales in the county are greater than those in the state, and ratios less than 1.00 indicating that per capita sales are greater in the state than the county.

$$\text{CTPF} = \frac{\text{County Per Capita Sales}}{\text{State Per Capita Sales}}$$

After computing the pull factors, more descriptive information can be presented that complements and completes the picture.

Trade area capture figures adjust a county's population by its CTPF. So those counties that have pull factors greater than 1.00 will capture a greater number of people in its trade area than there are people residing in the county. This therefore indicates that, on the whole, people are traveling to the county for some of their retail purchases. Likewise, those counties with pull factors of less than 1.00 will lose population since residents are traveling outside county borders to purchase goods & services. In the accompanying table, this information is located under the "Trade Capture Area" heading.

$$\text{Trade Capture Area} = \text{CTPF} \times \text{Population}$$

Another useful statistic computes the county's proportion of total sales subject to sales tax in Oklahoma. This is calculated by simply dividing the county's total sales subject to sales tax by the state's total sales subject to sales tax. In the table, this information is presented under the "Percent Market Share" heading.

$$\text{Market Share} = \frac{\text{County Total Sales Subject to Sales Tax}}{\text{State Total Sales Subject to Sales Tax}}$$

1

The size of the institutionalized population for each of the counties and the state were calculated by applying 1990 Census proportions to the current year population estimates.

Results

County Trade Pull Factors

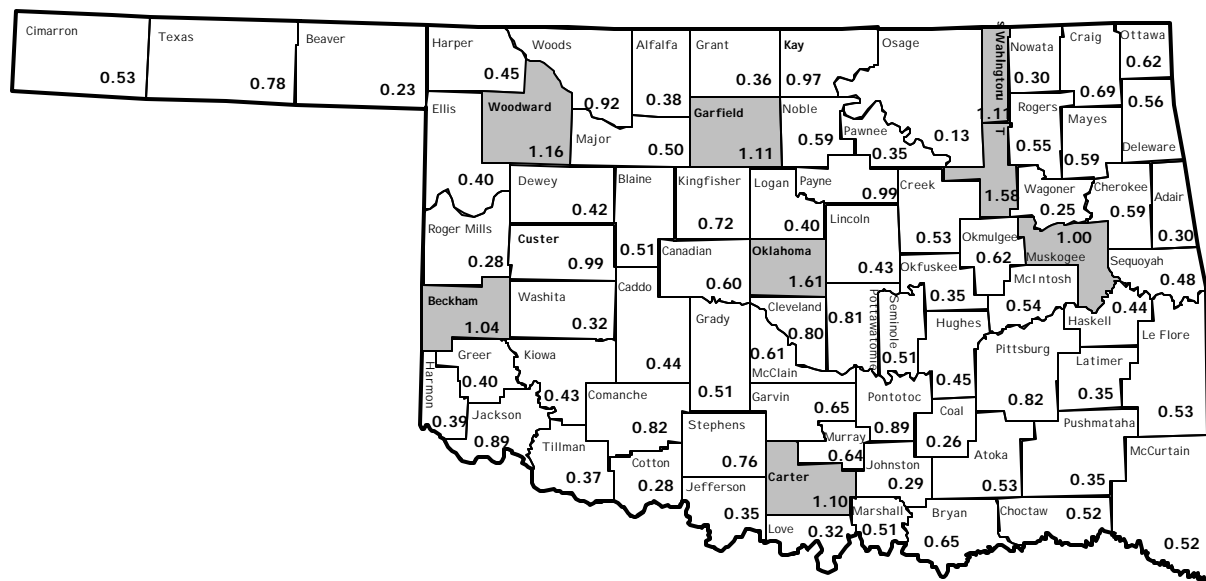
For the 1999 calendar year, the most recent year for which there is complete data, CTPF values ranged in size from a high of 1.61 in Oklahoma county to a low of 0.13 in Osage county. Only eight of Oklahoma's seventy-seven counties (or 10.4% of all the counties) managed CTPF values of 1.00 or greater in 1999. As can be seen from the accompanying map, the eight Oklahoma counties with CTPF values of 1.00 or greater were Oklahoma, Tulsa, Woodward, Garfield, Washington, Carter, Beckham and Muskogee counties.

Three of the counties with CTPFs of greater than 1.00 are located in northeast Oklahoma. Southeast Oklahoma does not contain any county with a CTPF of over 1.0, with Pontotoc (a 0.89 CTPF) and Pittsburg (a 0.82 CTPF) counties obtaining the highest CTPFs in the region. With a CTPF of 0.78 in Texas county, the Panhandle also does not contain a county with a CTPF of over 1.00. The remaining five counties with CTPFs of over 1.00 are spread evenly across the state.

As might be expected, Oklahoma's two largest counties, Oklahoma & Tulsa counties, posted CTPF values of greater than 1.00. However, the next three most populated counties, Cleveland, Comanche, and Canadian counties, had CTPF values of less than 1.00. This indicates that there is not a direct relationship between a county's population size and its respective trade pull factor value. Woodward county, with a 1999 population of 17,878 people, was the smallest county in the state to post a CTPF value of greater than 1.00.

Payne (0.99), Custer (0.99), Kay (0.97), and Woods (0.92) counties also managed to obtain relatively high CTPF values for the 1999 calendar year. Surprisingly, Payne county, sandwiched between Oklahoma City and Tulsa, obtained a high CTPF value. Part of the explanation for this may be due to the presence of Oklahoma State University in Stillwater. Custer county may have been helped by the presence of the interstate (I-40), two cities, Clinton and Weatherford, and the presence of Southwestern Oklahoma State University in Weatherford. Kay county also has two cities, Blackwell and Ponca City, an interstate (I-35), and is also on the Kansas border. Woods county is more remote, but Northwestern Oklahoma State University is located in Alva, and it too is on the Kansas border.

1999 County Trade Pull Factors



From a similar study completed by David Darling and Sara Logan for the state of Kansas, fifteen of Kansas' one hundred and five counties (14.3%) managed CTPF values of 1.00 or greater in fiscal year 1998 (July, 1997 to June, 1998). And CTPF values in the state of Kansas ranged from a high of 1.54 in Johnson county (which contains part of the Kansas City MSA) to a low of 0.21 in Kearny county.²

With a wider CTPF range in Oklahoma (a low of 0.13 to a high of 1.61) than in Kansas (a low of 0.21 to a high of 1.54), and a slightly lower proportion of counties with CTPF values greater than 1.00 in Oklahoma than in Kansas, this may indicate that there is greater regionalization in Oklahoma than in Kansas. Additionally, both Oklahoma and Tulsa counties have higher CTPF values than any Kansas county.

Sales Subject to Sales Tax

The state of Oklahoma had over \$28.3 billion worth of sales subject to sales tax in 1999. Sales subject to sales tax were over \$8.6 billion in Oklahoma county and over \$7.3 billion in Tulsa county. Together these two counties accounted for 56.5% of total sales subject to sales tax in the state. Which means that more than one out of every two dollars spent by Oklahomans and Oklahoma's businesses was spent in either Oklahoma or Tulsa counties.

With a non-institutionalized population of 3,308,710 people in 1999, per capita sales subject to sales tax reached \$8,566.70 for the state of Oklahoma. Obviously, counties with per capita sales figures greater than the state would have CTPFs of greater than 1.00, and those counties with per capita sales figures of less than the state would have CTPFs of less than 1.00. Per capita figures in both Oklahoma and Tulsa counties were about five thousand dollars greater than the state figure.

Trade Capture Area & Market Share

Although Oklahoma county's population was about 630,000, over one million people are considered to be in its trade capture area. The difference (381,939 people) are people who do not reside in the county but who travel to the county for retail trade. Additionally, the county accounts for three-tenths (30.56%) of all sales subject to sales tax in the state.

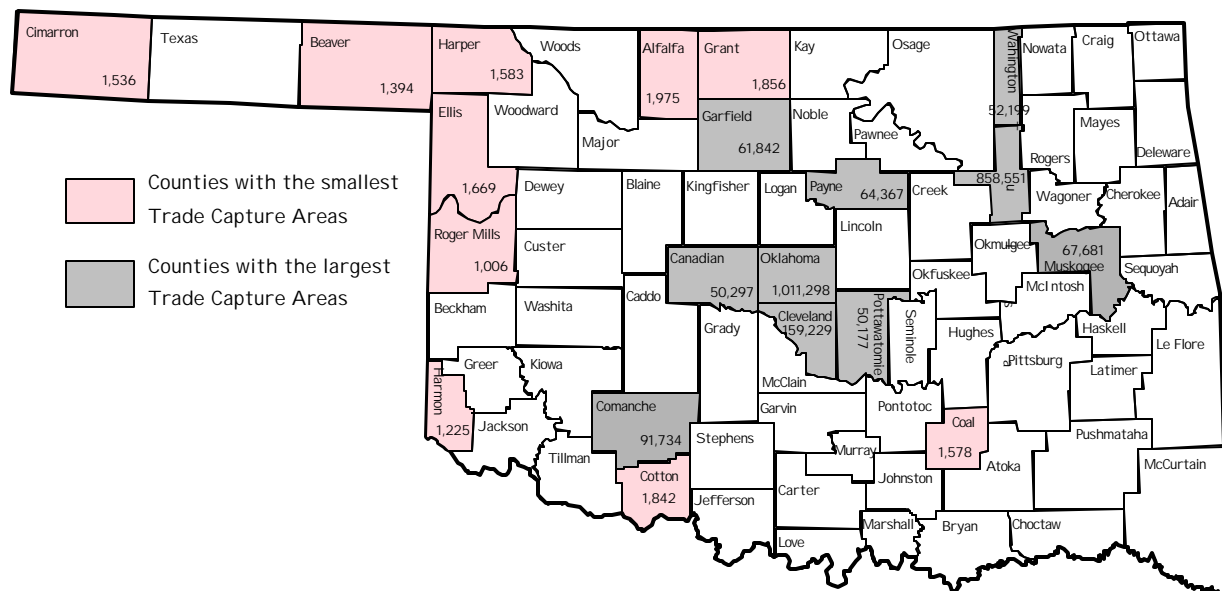
Tulsa county's relatively large CTPF has enabled it to also attain a sizeable trade capture area at 858,551 people. This means that at least 315,329 people are considered to be in the county's trade capture area, but do not reside within the county's borders. Tulsa county accounts for over one-quarter (25.95%) of the state's sales subject to sales tax.

After Oklahoma and Tulsa counties, Cleveland (4.81% or 159,229 people), Comanche (2.77% or 91,734 people), and Muskogee (2.05% or 67,681 people) counties have the largest market shares and trade capture areas. And of those counties, Cleveland county is in the Oklahoma City metro area.

The accompanying map depicts the ten counties with the greatest trade capture areas, and the ten counties with the smallest trade capture areas. As is evident, most of the counties with the greatest trade capture area are located in Central and Northeast Oklahoma. Only Comanche county in Southwest Oklahoma and possibly Garfield county in North Central Oklahoma fall outside the two regions. Combined, these ten counties claim 2,467,375 people (or 74.6% of the population) in their trade capture areas.

Nine of the ten counties with the smallest trade capture areas lie West of I-35, with Coal county being the only exception. Of these ten rural counties, only Cotton county has an interstate (I-44) running through it. Combined, these ten counties claim 15,664 people (or 0.5% of the population) in their trade capture areas.

Oklahoma Counties with the Largest & Smallest Trade Capture Areas



CTPF Adjusted for Income

As previously mentioned, the basic CTPF model assumes that per capita personal income is equal for every county and the state as a whole. If incomes were not assumed to be equal across counties, then part of the explanation for a county having higher per capita retail sales (and thus a higher CTPF) could be attributable to income differences. The problem when incomes are not assumed to be equal becomes one of measuring the pull factors and trade capture areas.

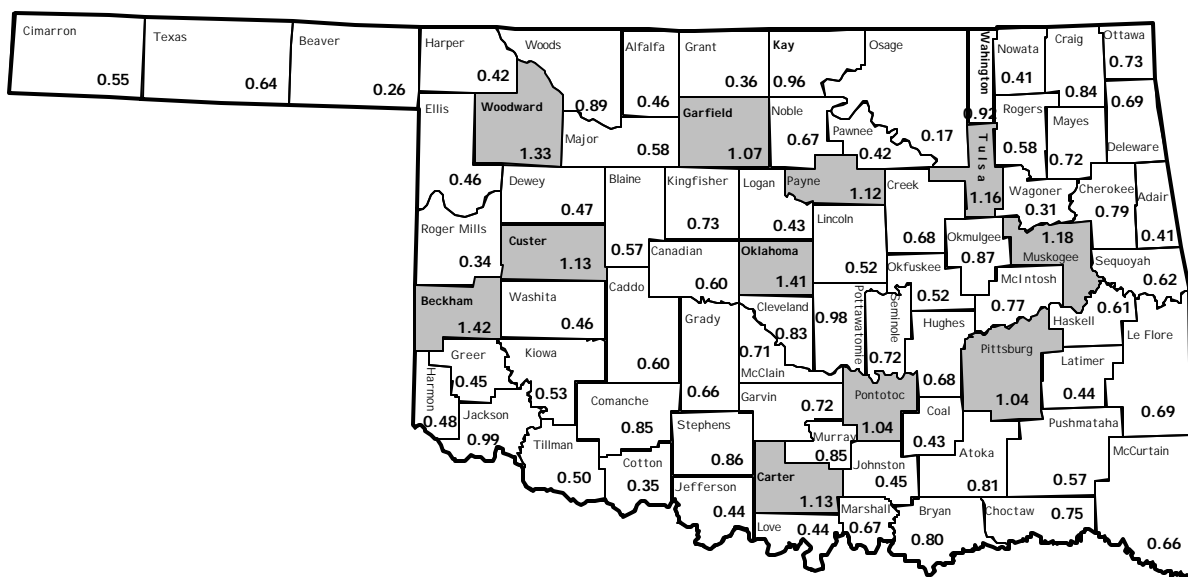
As would be expected, per capita personal income (PCPI) is different across counties. A simple adjustment to the basic CTPF model can be made to eliminate the effects of income on the pull factors, and then measure the adjusted trade capture area. The adjustment simply requires dividing the CTPF by the proportion of county to state PCPI.

$$\text{Income - Adjusted CTPF} = \frac{\text{CTPF}}{\text{County PCPI} / \text{State PCPI}}$$

Therefore, those counties that have a higher PCPI than the state will produce a PCPI proportion that is greater than 1.0. This in turn will reduce the county's trade pull factor. The rationale for this is that part of the reason the county has more per capita retail sales than the state is due to the higher income. This adjustment eliminates the income differences across counties. Likewise, those counties that have a lower PCPI than the state will produce a PCPI proportion that is less than 1.0, and this in turn will raise the county's trade pull factor.

Whereas eight counties had basic pull factors greater than 1.00, eleven counties have income-adjusted pull factors greater than 1.00. Washington county was the only county that dropped from a basic pull factor of over 1.00 to an income-adjusted pull factor of less than 1.00. This indicates that Washington county's PCPI was higher than the state's PCPI. With one county dropping out, four counties jumped from having basic pull factors of less than 1.00 to income-adjusted pull factors of greater than 1.00. Those four counties are Custer (from 0.99 to 1.13), Payne (from 0.99 to 1.12), Pittsburg (from 0.82 to 1.04), and Pontotoc (from 0.89 to 1.04).

1999 Income-Adjusted County Trade Pull Factors



Of the remaining seven counties with income-adjusted pull factors greater than 1.00, four had higher income-adjusted pull factors than basic pull factors. With a 1999 PCPI of 73.7% of the state, Beckham county had the largest increase from a basic pull factor of 1.04 to an income-adjusted pull factor of 1.42. This pull factor adjustment would push Beckham county's trade capture area to 27,311 people. Muskogee, Woodward, and Carter counties also fall into the category of having higher income-adjusted pull factors than basic pull factors.

Garfield, Oklahoma and Tulsa counties each had a higher PCPI than the state which caused each of their respective pull factors to drop. Tulsa county, with the highest PCPI at 136.5% of the state's PCPI, experienced the greatest drop. Tulsa county's pull factor dropped from a basic pull factor of 1.58 to an income-adjusted pull factor of 1.16. Even with this drop, Tulsa county's trade capture area includes over 630,000 people. Oklahoma county's PCPI was 114.0% of the state average which caused its basic pull factor to drop from 1.61 to an income-adjusted pull factor of 1.41. Associated with this income-adjusted pull factor is a trade capture area of over 880,000 people.

Of all seventy-seven Oklahoma counties, only nine had PCPI levels greater than the state's PCPI. This means that only nine counties have lower income-adjusted pull factors than basic pull factors. And as already mentioned, included in this nine are the state's two most populous counties - Oklahoma and Tulsa counties.

Sources:

David Darling & Sara Logan, "County Trade Pull Factors, FY 1998", *Kansas Business Review*, Volume 22, no.3, Spring 1999.

Notes:

Per capita personal income (PCPI) data is for the most current year available (1998). It was obtained from the REIS CD-ROM (1969-1998).

Bureau of Economic Analysis, US Department of Commerce, Regional Economic Information System CD-ROM, 1969-1998.

Sales subject to sales tax (SSTST) information was obtained from the ORIGINS database.

ORIGINS database, (Oklahoma Resources Integration General Information Network System),
www.origins.ou.edu.

Total county population estimates and estimates of group quarters population was obtained from the US Census Bureau at:

www.census.gov/population/estimates/county/co-99-8/99C8_40.txt

The 1999 group quarters population was adjusted to account for the institutionalized by using 1990 US Census proportions.

Table: 1999 County Trade Pull Factors for the state of Oklahoma

County	Total 1999 SSTST*	1999 Population	Per Capita Sales	County Trade Pull Factor	Trade Capture Area	Market Share	1998 PCPI	CTPF Adjusted for PCPI
Adair	51.554	20,346	2533.88	0.30	6,018	0.18%	15,678	0.41
Alfalfa	16.923	5,218	3243.08	0.38	1,975	0.06%	17,904	0.46
Atoka	55.633	12,313	4518.37	0.53	6,494	0.20%	14,343	0.81
Beaver	11.941	5,953	2005.77	0.23	1,394	0.04%	19,431	0.26
Beckham	171.927	19,233	8939.10	1.04	20,069	0.61%	16,184	1.42
Blaine	44.106	9,998	4411.44	0.51	5,148	0.16%	19,706	0.57
Bryan	191.783	34,487	5561.02	0.65	22,387	0.68%	17,848	0.80
Caddo	111.434	29,293	3804.15	0.44	13,008	0.39%	16,215	0.60
Canadian	430.877	84,185	5118.20	0.60	50,297	1.52%	21,917	0.60
Carter	412.389	43,703	9436.09	1.10	48,139	1.45%	21,344	1.13
Cherokee	199.650	39,292	5081.25	0.59	23,305	0.70%	16,480	0.79
Choctaw	66.283	14,804	4477.25	0.52	7,737	0.23%	15,237	0.75
Cimarron	13.162	2,889	4555.66	0.53	1,536	0.05%	21,098	0.55
Cleveland	1,364.071	199,577	6834.82	0.80	159,229	4.81%	21,203	0.83
Coal	13.516	6,058	2230.95	0.26	1,578	0.05%	13,386	0.43
Comanche	785.855	111,835	7026.94	0.82	91,734	2.77%	21,257	0.85
Cotton	15.777	6,495	2429.01	0.28	1,842	0.06%	17,924	0.35
Craig	80.935	13,785	5871.08	0.69	9,448	0.29%	18,008	0.84
Creek	309.384	67,569	4578.77	0.53	36,115	1.09%	17,358	0.68
Custer	212.315	25,093	8461.05	0.99	24,784	0.75%	19,140	1.13
Delaware	165.913	34,612	4793.52	0.56	19,367	0.59%	17,753	0.69
Dewey	16.978	4,768	3560.54	0.42	1,982	0.06%	19,306	0.47
Ellis	14.209	4,128	3441.94	0.40	1,659	0.05%	19,335	0.46
Garfield	529.781	55,944	9469.89	1.11	61,842	1.87%	22,720	1.07
Garvin	144.142	26,055	5532.34	0.65	16,826	0.51%	19,590	0.72
Grady	199.594	45,533	4383.51	0.51	23,299	0.70%	17,078	0.66
Grant	15.901	5,130	3099.32	0.36	1,856	0.06%	22,204	0.36
Greer	18.866	5,484	3439.97	0.40	2,202	0.07%	19,704	0.45
Harmon	10.493	3,178	3302.12	0.39	1,225	0.04%	17,736	0.48
Harper	13.564	3,497	3878.33	0.45	1,583	0.05%	23,708	0.42
Haskell	43.132	11,323	3809.21	0.44	5,035	0.15%	16,009	0.61
Hughes	49.141	12,793	3841.16	0.45	5,736	0.17%	14,499	0.68
Jackson	214.751	28,196	7616.34	0.89	25,068	0.76%	19,700	0.99
Jefferson	19.125	6,341	3015.95	0.35	2,232	0.07%	17,630	0.44
Johnston	25.262	10,186	2480.19	0.29	2,949	0.09%	14,046	0.45
Kay	380.360	45,745	8314.87	0.97	44,400	1.34%	22,273	0.96
Kingfisher	82.453	13,308	6195.75	0.72	9,625	0.29%	21,715	0.73
Kiowa	37.625	10,258	3667.78	0.43	4,392	0.13%	17,789	0.53
Latimer	29.816	9,926	3003.76	0.35	3,480	0.11%	17,693	0.44
Leflore	208.691	45,748	4561.70	0.53	24,361	0.74%	16,919	0.69
Lincoln	114.911	31,549	3642.32	0.43	13,414	0.41%	17,976	0.52
Logan	103.371	29,972	3448.87	0.40	12,067	0.36%	20,509	0.43
Love	23.208	8,494	2732.15	0.32	2,709	0.08%	15,774	0.44
McClain	139.041	26,531	5240.76	0.61	16,230	0.49%	18,809	0.71
McCurtain	152.788	34,351	4447.88	0.52	17,835	0.54%	17,210	0.66
McIntosh	88.339	19,063	4633.97	0.54	10,312	0.31%	15,386	0.77
Major	32.049	7,540	4250.31	0.50	3,741	0.11%	18,874	0.58
Marshall	52.780	12,079	4369.54	0.51	6,161	0.19%	16,697	0.67
Mayes	192.991	38,009	5077.57	0.59	22,528	0.68%	18,205	0.72
Murray	66.656	12,089	5513.97	0.64	7,781	0.24%	16,720	0.85
Muskogee	579.799	67,771	8555.25	1.00	67,681	2.05%	18,538	1.18
Noble	55.958	11,060	5059.56	0.59	6,532	0.20%	19,503	0.67
Nowata	25.330	9,888	2561.72	0.30	2,957	0.09%	16,188	0.41

County	Total 1999 SSTST*	1999 Population	Per Capita Sales	County Trade Pull Factor	Trade Capture Area	Market Share	1998 PCPI	CTPF Adjusted for PCPI
Okfuskee	31.365	10,449	3001.80	0.35	3,661	0.11%	14,767	0.52
Oklahoma	8,663.488	629,359	13765.58	1.61	1,011,298	30.56%	25,031	1.41
Okmulgee	201.869	38,175	5287.94	0.62	23,564	0.71%	15,599	0.87
Osage	47.542	41,819	1136.86	0.13	5,550	0.17%	17,618	0.17
Ottawa	161.790	30,611	5285.34	0.62	18,886	0.57%	18,537	0.73
Pawnee	49.429	16,441	3006.46	0.35	5,770	0.17%	18,181	0.42
Payne	551.412	64,778	8512.32	0.99	64,367	1.95%	19,405	1.12
Pittsburg	287.710	41,110	6998.48	0.82	33,585	1.02%	17,184	1.04
Pontotac	260.926	34,172	7635.73	0.89	30,458	0.92%	18,868	1.04
Pottawatomie	429.848	61,860	6948.76	0.81	50,177	1.52%	18,224	0.98
Pushmataha	34.550	11,420	3025.36	0.35	4,033	0.12%	13,512	0.57
Roger Mills	8.619	3,560	2421.05	0.28	1,006	0.03%	18,457	0.34
Rogers	329.856	70,148	4702.25	0.55	38,504	1.16%	20,657	0.58
Seminole	104.283	24,029	4339.88	0.51	12,173	0.37%	15,555	0.72
Sequoyah	153.637	37,529	4093.85	0.48	17,934	0.54%	16,964	0.62
Stephens	277.277	42,551	6516.28	0.76	32,367	0.98%	19,422	0.86
Texas	122.453	18,278	6699.49	0.78	14,294	0.43%	26,751	0.64
Tillman	29.183	9,147	3190.44	0.37	3,407	0.10%	16,259	0.50
Tulsa	7,354.944	543,222	13539.48	1.58	858,551	25.95%	29,990	1.16
Wagoner	120.017	55,889	2147.43	0.25	14,010	0.42%	17,836	0.31
Washington	447.171	47,236	9466.69	1.11	52,199	1.58%	26,271	0.92
Washita	31.039	11,451	2710.60	0.32	3,623	0.11%	15,261	0.46
Woods	62.527	7,951	7863.65	0.92	7,299	0.22%	22,640	0.89
Woodward	177.256	17,878	9914.64	1.16	20,691	0.63%	19,151	1.33
OKLAHOMA	28,344.722	3,308,710	8566.70	1.00	3,308,710	100.00%	21,964	1.00

Note: SSTST = Sales Subject to Sales Tax, which is in millions of dollars.

PCPI = Per Capita Personal Income, which is reported in dollars.