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Retail Rodeo: Wrangling Retail Sales Success Estimates for Cities Across Arkansas

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Overview

Consumer spending choices play a crucial role in determining the financial resources available to local governments. Many essential community services, such as police, fire, and recreation programs, are funded through retail tax revenue collected from local sales (Loy et al., 2018). From this perspective, it's essential for community leaders to identify and understand the relative health of their retail sales sector. Specifically, these cities and counties should know how much retail sales tax revenue they lose when consumers spend outside their community. In this paper, we address this issue by introducing a 'Pull Factor' as a straightforward tool for assessing a community's retail economic performance and discussing how this measurement can guide local policy decisions.

What is a Pull Factor?

Pull factors measure the relative strength of a community's ability to retain local customers and attract non-local retail shoppers. They offer an easy-to-understand measure of the health of a community's retail sector by providing the ratio between actual retail sales and potential retail demand within the community. For example, if a city has a pull factor greater than 1, this means it captures all its local retail shoppers plus other shoppers who reside outside of the city (Figure 1). In contrast, a pull factor of less than 1 indicates that the city is losing local retail dollars to other locations. Therefore, pull factors offer an easy and effective measure of a community's retail health, highlighting its ability to retain local shoppers and attract non-local spending.

Figure 1. Pull Factors Interpretation

INTERPRETATION

- **PF < 1: The community is losing local retail shoppers to other areas.**
- **PF = 1: The community is capturing retail consumer activity equal to their population.**
- **PF > 1: The community captures local (equal to their population) and non-local retail shoppers.**

Example

Little Rock has a pull factor of 1.32. This indicates the city's retail sector is capturing all local shoppers (pop. 202,864) plus non-local shoppers, equal to 32% of Little Rock's population (approximately 64,916 shoppers).

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How to Calculate Pull Factors

Pull factors can be developed in several different ways, depending on the method used to calculate the potential retail demand in communities. One popular formula was built based on the assumption that per capita retail demand increases proportionally with per capita income (Hustedde, et al., 1993) (Figure 2). This formula gained popularity for its simplicity and more realistic assumptions, particularly when compared to simpler formulas that assume a fixed per capita retail demand.

To measure the retail demand of communities, this formula first requires the calculation of "Trade Area Capture" (TAC), which quantifies the economic activity (i.e. retail sales) retained within a specific local trade area. In other words, it measures how much retail spending is being "captured" by a specific area. TAC helps us understand how much of the retail spending comes from the local population versus shoppers coming from outside the community. TAC is calculated by considering total retail sales, income level, and population in the community, along with the state's income, retail sales, and population.

Figure 2 illustrates the step-by-step calculation of TAC. To calculate TAC accurately, several key pieces of data are needed: (1) per capita income (PCI) at the city and state level, (2) the most recent official census population estimate, (3) retail sales tax collections, and (4) the city's sales tax rate. The population and PCI for both the state and city can be found on the U.S. Census website. While PCI is based on a five-year moving average (e.g., 2018-2022), it may not provide an exact measure for each year, but it offers a good sense of the current trend in per capita income. Retail sales tax collections for the city can be accessed through the Arkansas Department of Finance and Administration (DFA) website, specifically in the "Local Tax Distribution by NAICS" files. By entering the city's name, users can view an index of monthly tax files detailing sales and use tax collections within the city. These reports are broken down by North American Industry Classification System (NAICS) codes, with the retail sector codes starting from 44XX-45XX. While tax collections also cover other sectors, such as entertainment, recreation, and food services, this paper focuses specifically on the retail sector and the sales generated by brick-and-mortar businesses.

Figure 2. Overview of Calculating Pull Factors

THE PULL FACTOR FORMULA

Pull factors are based on a Trade Area Capture (TAC) measure that estimates the total number of shoppers a city attracts. The TAC is then divided by the city's most recent population estimate to derive a pull factor.

$$TAC = \frac{\text{Total Retail Sales (city level)*}}{\left[\frac{\text{Total Retail Sales (state level)**}}{\text{Population (state level)}}\right] X \left[\frac{\text{Per Capita Income (city level)}}{\text{Per Capita Income (state level)}}\right]}$$

$$\text{Pull Factor} = \frac{TAC}{\text{Population (city level)}}$$

$$\text{*Total Retail Sales (city level)} = \frac{\text{Retail Sales Tax Collections (city)}}{\text{Tax Rate (city)}}$$

$$\text{**Total Retail Sales (state level)} = \frac{\text{Retail Sales Tax Collections (state)}}{\text{Tax Rate (state)}}$$

Data Sources

Population Information: U.S. Census
Per Capita Income Information: U.S. Census (for cities), Federal Reserve Economic Data (for counties and state)
Tax Information: Arkansas Local Tax Distribution by NAICS, Department of Finance and Administration with retail sector codes (44XX-45XX)

Calculation Example for Little Rock, 2022

Total Retail Sales (city level) = $\frac{\text{Retail Sales Tax Collections (city)}}{\text{Tax Rate (city)}} = \frac{39,015,991.27}{0.01125}$ = **3,468,088,113**

Total Retail Sales (state level) = $\frac{\text{Retail Sales Tax Collections (state)}}{\text{Tax Rate (state)}} = \frac{3,337,230,837.4}{0.065}$ = **51,342,012,883**

Per Capita Income (city level) = $42,616
Per Capita Income (state level) = $55,323
Population (state level) = 3,045,637
Population (city level) = 202,864

$$TAC = \frac{\text{Total Retail Sales (city level)}}{\left[\frac{\text{Total Retail Sales (state level)**}}{\text{Population (state level)}}\right] X \left[\frac{\text{Per Capita Income (city level)}}{\text{Per Capita Income (state level)}}\right]}$$

$$= \frac{3,468,088,113}{\left[\frac{51,342,012,883}{3,045,637}\right] X \left[\frac{42,616}{55,323}\right]}$$

$$\text{Pull Factor} = \left[\frac{TAC}{P\text{ (city)}}\right] = \left[\frac{267,072}{202,864}\right] = 1.32$$

Note: For online shopping, sales tax on purchases is primarily collected based on the buyer's shipping address, following a destination-based sourcing approach. For example, if you reside in Bryant and buy shoes online from Academy Sports (even if they have a physical store in Benton), the sales tax would be allocated to Bryant. This tax collection method affects Bryant's pull factor, as online purchases made by Bryant residents from non-local retailers (including those with nearby physical stores) contribute to Bryant's sales, thus boosting its pull factor.

Pull Factors for 75 Cities in Arkansas

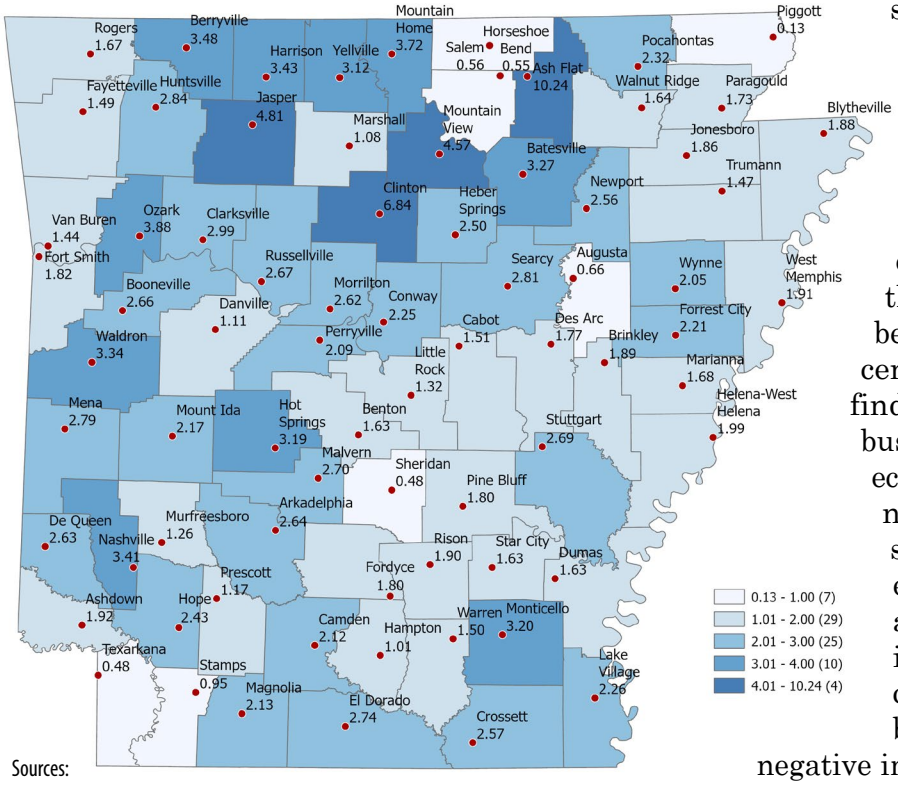
Figure 3 shows pull factors for the largest cities in each Arkansas county. A table of the data used in the city-level calculation is available in the Appendix, which demonstrates how pull factors can vary widely across cities with similar populations and locations.

Generally, large cities such as Little Rock have pull factors greater than 1 due to the abundance of retail shops within the city limits. Because of its vast selection of retail goods, Little Rock can capture the "leakage" of consumers from smaller surrounding cities with fewer stores that offer a smaller diversity of goods. Likewise, smaller cities, such as Piggott (2022 population: 3,610) in Clay County, are likely to have a pull factor of near zero since their population is unlikely to be able to support a retail sector that would retain local shoppers.

However, it is possible for smaller cities, such as Stuttgart (2022 population: 7,907), to have a pull factor greater than 1 because they serve as a hub for consumers in small surrounding communities who are unable to travel to larger cities. Similarly, Ash Flat (2022 population: 1,349) in Sharp County exhibits the highest pull factor among the 75 cities, at 10.24. This indicates that Ash Flat, which has the largest retailer (Walmart) in that region, likely captures the majority of retail demand from residents in the surrounding rural cities. Thus, pull factors are influenced not only by city size but also by the availability of retail options and a city's role as a regional hub, highlighting the diverse economic dynamics between large and small cities.

Furthermore, the map shows some notable implications for certain cities. For instance, it suggests that the Arkansas side of Texarkana is struggling, with a pull factor of 0.46, indicating that it is losing retail sales to the Texas side. In addition, two cities located only seven miles apart and separated by the Arkansas River in northwest Arkansas, Van Buren and Fort Smith, both have pull factors greater than 1, which is noteworthy given their population differences (Van Buren: 23,755; Fort Smith: 89,992). One possible reason for this is that Van Buren may capture a significant portion of retail demand from travelers driving on I-40, which cuts directly through the city, contributing to its relatively high pull factor despite its smaller size. This case further emphasizes the importance of geographic location in determining pull factors.

Figure 3. Pull Factors for 75 Cities in Arkansas, 2022



Sources:
1. PCI & population for cities and the state: U.S. Census
2. PCI for the state: Federal Reserve Economic Data
3. Retail sales tax collection & tax rates: Arkansas Department of Finance and Administration
Note: The retail sales data was collected by the Arkansas Economic Development Institute

Implications

The pull factors of 75 Arkansas cities suggest both opportunities and challenges for urban and regional policies. On one hand, higher pull factors indicate that the city attracts a concentration of economic activity, talent, and amenities, which can spark innovation, entrepreneurship, and overall economic expansion. On the other hand, this concentration also widens the gap between high pull factor cities and adjacent smaller cities. Smaller cities may find it difficult to compete for residents, businesses, and investments, leading to economic disparities and potential stagnation. To address these challenges, strategic policies are needed to bolster economic development, infrastructure, and quality of life in smaller cities. By investing in economically distressed cities, policymakers can foster more balanced regional growth, mitigate the negative impacts of concentration in big regional cities, and promote economic resilience while creating equitable opportunities across urban and rural communities.

While pull factors offer a simple way for communities to assess the health of their retail sector, they can also leave communities feeling frustrated and in need of a more comprehensive policy approach, and city officials may wonder how they can increase their city's pull factor. The straightforward answer is to boost retail sales, but this can lead to the "chicken or the egg" dilemma, as increasing retail sales typically require a rise in factors such as population, income, or the number of new retail businesses. Moreover, shopping patterns are not solely influenced by proximity to a city. Instead, they are shaped by a mix of commuting habits and spending preferences based on residents' income and education level, race, gender, and age. As a result, policymakers must analyze an area's pull factors from a variety of perspectives — demographic, geographical, and industrial — to effectively promote retail sales and foster growth.

Lastly, retail leakage (consumers leaving their community to shop elsewhere) does not automatically equate to a business opportunity. The community may have insufficient demand for that service due to a lack of population or preferences. For example, consumers may prefer to travel large distances to shop at Costco in Little Rock, a city with a relatively large population, because it is the only location in Arkansas. However, it would not make sense for a Costco to open in a small town as the smaller population would not be able to support it without the guarantee of outside shoppers willing to travel the long distance to shop there. Therefore, it is recommended that communities calculating their own pull factors also conduct additional research, such as reviewing population demographics and preferences. Using other analyses in context with the pull factors can reveal opportunities for retail growth.

References

Arkansas Department of Finance and Administration. (2024). *Local Tax Distribution by NAICS*. Retrieved from: https://www.ark.org/dfa/localtaxes/index.php.

Arkansas Department of Finance and Administration. (2024). *Sales and Use Tax – Cities and Counties Tax Rates*. Retrieved from: https://www.dfa.arkansas.gov/office/taxes/excise-tax-administration/sales-use-tax/sales-use-tax-rates/city-and-county-sales-use-tax-rates/.

Hustedde, R., Shaffer, R., Hustedde, R. J., Pulver, G. (1993). *Community Economic Analysis: A How To Manual*. United States: North Central Regional Center for Rural Development, Iowa State University.

Loy, R., Whitacre, B., and Shideler, D. (2018). Pull Factors: *A Measure of Retail Sales Success, Estimates for 77 Oklahoma Cities (2018)*. Oklahoma State University Fact Sheet. AGEC-1079. Retrieved from: https://extension.okstate.edu/fact-sheets/print-publications/agec/pull-factors-a-measure-of-retail-sales-success-estimates-for-77-oklahoma-cities-2018-agec-1079.pdf.

Pakko, M., (2021). *Arkansas Retail Sales – A New Data Set from AEDI*. Arkansas Economist. Retrieved from: https://arkansaseconomist.com/arkansas-retail-sales/.

United States Census Bureau. (2024). Per Capital Income in Past 12 Months (in 2022 dollars), 2018-2022. Quick Facts – Income & Poverty. Retrieved from: https://www.census.gov/quickfacts/.

United States Census Bureau. (2024). Population Estimates, July 1, 2023, (V203). Quick Facts – Population. Retrieved from: https://www.census.gov/quickfacts/.

Federal Reserve Bank of St. Louis (FRED). (2024). Per Capita Personal Income in Arkansas.Retrieved from: https://fred.stlouisfed.org/series/ARPCPI#:~:text=Download,2024%209:09%20AM%20CDT.

COUNTY	CITY	PCI	POPULATION	RETAIL SALES TAX COLLECTIONS	TAX RATE	RETAIL SALES	TRADE AREA CAPTURE	PULL FACTORS
Arkansas	Stuttgart	26,210	7,907	5,103,138	0.0300	170,104,614	21,299	2.69
Ashley	Crossett	25,308	4,822	1,671,947	0.0175	95,539,826	12,389	2.57
Baxter	Mountain Home	30,884	13,150	9,810,460	0.0213	460,584,981	48,943	3.72
Benton	Rogers	41,623	72,999	30,996,053	0.0200	1,549,802,655	122,195	1.67
Boone	Harrison	27,095	13,338	6,615,734	0.0175	378,041,935	45,789	3.43
Bradley	Warren	21,120	5,227	506,232	0.0100	50,623,156	7,866	1.50
Calhoun	Hampton	24,184	1,354	50,636	0.0050	10,127,152	1,374	1.01
Carroll	Berryville	21,656	5,751	2,642,496	0.0200	132,124,820	20,022	3.48
Chicot	Lake Village	22,914	2,065	652,617	0.0200	32,630,859	4,673	2.26
Clark	Arkadelphia	20,130	10,258	3,318,067	0.0200	165,903,368	27,047	2.64
Clay	Piggott	24,537	3,610	465,492	0.0200	23,274,594	3,113	0.13
Cleburne	Heber Springs	30,995	7,201	1,697,665	0.0100	169,766,469	17,975	2.50
Cleveland	Rison	19,758	917	104,839	0.0100	10,483,947	1,741	1.90
Columbia	Magnolia	26,087	10,780	4,325,436	0.0238	182,123,630	22,911	2.13
Conway	Morrilton	25,733	7,079	1,452,909	0.0100	145,290,949	18,529	2.62
Craighead	Jonesboro	31,108	79,876	14,084,579	0.0100	1,408,457,943	148,588	1.86
Crawford	Van Buren	29,609	23,755	4,631,749	0.0150	308,783,243	34,225	1.44
Crittenden	West Memphis	22,985	23,795	4,774,919	0.0150	318,327,956	45,451	1.91
Cross	Wynne	26,214	8,208	1,343,966	0.0100	134,396,626	16,825	2.05
Dallas	Fordyce	22,456	3,386	625,996	0.0150	41,733,038	6,099	1.80
Desha	Dumas	17,722	3,965	1,045,402	0.0300	34,846,723	6,453	1.63
Drew	Monticello	22,643	8,176	1,807,043	0.0100	180,704,335	26,191	3.20
Faulkner	Conway	31,301	67,617	25,432,809	0.0175	1,453,303,352	152,373	2.25
Franklin	Ozark	19,220	3,546	1,610,044	0.0200	80,502,189	13,746	3.88
Fulton	Salem	41,478	2,476	175,086	0.0100	17,508,558	1,385	0.56
Garland	Hot Springs	28,775	38,109	16,002,284	0.0150	1,066,818,944	121,671	3.19
Grant	Sheridan	27,554	5,103	2,208,971	0.0200	110,448,545	13,155	0.48
Greene	Paragould	26,245	30,178	3,129,117	0.0075	417,215,549	52,170	1.73
Hempstead	Hope	26,157	8,624	1,671,772	0.0100	167,177,211	20,975	2.43
Hot Spring	Malvern	17,387	10,967	3,132,357	0.0200	156,617,866	29,562	2.70
Howard	Nashville	21,543	4,156	929,171	0.0100	92,917,056	14,155	3.41
Independence	Batesville	27,445	11,173	6,116,634	0.0200	305,831,679	36,570	3.27
Izard	Horseshoe Bend	24,125	2,423	196,413	0.0200	9,820,657	1,336	0.55
Jackson	Newport	17,455	7,967	1,628,700	0.0150	108,579,981	20,415	2.56
Jefferson	Pine Bluff	21,170	39,495	10,291,165	0.0225	457,385,109	70,904	1.80
Johnson	Clarksville	21,514	9,555	3,748,089	0.0200	187,404,472	28,587	2.99
Lafayette	Stamps	19,400	1,481	83,523	0.0100	8,352,321	1,413	0.95
Lee	Marianna	15,392	3,575	561,978	0.0200	28,098,899	5,991	1.68
Lincoln	Star City	26,265	2,299	374,439	0.0125	29,955,115	3,743	1.63
Little River	Ashdown	26,596	4,264	1,327,060	0.0200	66,352,992	8,188	1.92
Logan	Booneville	21,773	3,819	1,346,526	0.0200	67,326,277	10,148	2.66

COUNTY	CITY	PCI	POPULATION	RETAIL SALES TAX COLLECTIONS	TAX RATE	RETAIL SALES	TRADE AREA CAPTURE	PULL FACTORS
Lonoke	Cabot	32,541	26,830	8,019,729	0.0200	400,986,454	40,440	1.51
Madison	Huntsville	26,453	2,973	1,361,163	0.0200	68,058,169	8,443	2.84
Marion	Yellville	19,623	1,159	431,809	0.0200	21,590,461	3,611	3.12
Miller	Texarkana	26,827	29,306	2,889,048	0.0250	115,561,937	14,137	0.48
Mississippi	Blytheville	27,283	12,706	2,977,727	0.0150	198,515,115	23,879	1.88
Monroe	Brinkley	20,680	2,693	961,696	0.0300	32,056,547	5,087	1.89
Montgomery	Mount Ida	22,928	1,410	213,522	0.0100	21,352,180	3,056	2.17
Nevada	Prescott	16,831	3,079	369,788	0.0200	18,489,422	3,605	1.17
Newton	Jasper	17,096	618	309,404	0.0200	15,470,213	2,970	4.81
Ouachita	Camden	24,706	10,298	2,881,148	0.0175	164,637,026	21,869	2.12
Perry	Perryville	25,388	1,302	210,766	0.0100	21,076,603	2,724	2.09
Phillips	Helena-West Helena	18,463	8,872	1,983,651	0.0200	99,182,563	17,630	1.99
Pike	Murfreesboro	22,241	1,703	217,951	0.0150	14,530,096	2,144	1.26
Poinsett	Trumann	22,596	7,305	1,478,581	0.0200	73,929,026	10,737	1.47
Polk	Mena	31,725	5,599	1,512,316	0.0100	151,231,620	15,644	2.79
Pope	Russellville	25,477	29,133	9,067,293	0.0150	604,486,183	77,866	2.67
Prairie	Des Arc	21,536	1,400	488,067	0.0300	16,268,904	2,479	1.77
Pulaski	Little Rock	42,616	202,864	39,015,991	0.0113	3,468,088,113	267,072	1.32
Randolph	Pocahontas	26,050	7,546	2,782,779	0.0200	139,138,961	17,529	2.32
St. Francis	Forrest City	16,551	12,676	2,643,998	0.0188	141,013,225	27,961	2.21
Saline	Benton	34,257	36,593	15,582,332	0.0250	623,293,269	59,711	1.63
Scott	Waldron	18,187	3,375	624,192	0.0100	62,419,155	11,263	3.34
Searcy	Marshall	17,299	1,384	117,730	0.0150	7,848,659	1,489	1.08
Sebastian	Fort Smith	32,809	89,992	32,804,289	0.0200	1,640,214,439	164,066	1.82
Sevier	De Queen	23,247	6,042	1,126,506	0.0100	112,650,605	15,903	2.63
Sharp	Ash Flat	22,306	1,349	1,290,851	0.0138	93,880,072	13,812	10.24
Stone	Mountain View	22,568	2,868	1,803,159	0.0200	90,157,937	13,111	4.57
Union	El Dorado	25,284	17,063	4,506,536	0.0125	360,522,844	46,795	2.74
Van Buren	Clinton	21,809	2,508	1,139,504	0.0100	113,950,405	17,147	6.84
Washington	Fayetteville	35,997	99,285	32,523,126	0.0200	1,626,156,277	148,254	1.49
White	Searcy	25,551	23,009	7,563,925	0.0150	504,261,662	64,768	2.81
Woodruff	Augusta	27,993	1,995	111,693	0.0100	11,169,327	1,309	0.66
Yell	Danville	24,601	2,384	297,863	0.0150	19,857,528	2,649	1.11

Sources: 1. PCI & population for cities and the state: U.S. Census 2. PCI for the state: Federal Reserve Economic Data (FRED) 3. Retail sales tax collection & tax rates: Arkansas Department of Finance and Administration. Note: The retail sales data was collected by the Arkansas Economic Development Institute (AEDI).

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