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A Pull Factor Analysis of Trends in Food and Beverage Retail Sales in Mississippi Counties

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Introduction

Retail trade plays an important role in a local community's economic well-being. It fosters the creation of jobs, income, and tax revenues. It serves as a support industry to the area's industrial base by providing inputs for these enterprises and meeting the consumer needs of its workers. Furthermore, if the local retail trade sector provides goods and services, which are not available in other locations, it attracts dollars from out-of-town shoppers.

From a regional perspective, a community's ability to increase retail sales comes at the expense of a reduction in another community's retail sales. Studies conducted by Darling and Tan, Deller, and Gale have shown that a trend in declining retail sales in rural America during the 1980s. Though larger towns and cities have not shared the forlorn fate of their rural counterparts, the decline in retail trade activity has aggravated the loss of jobs and income for these rural communities during this period.

Is it feasible for smaller communities to retain or attract shoppers into its retail establishments? This is dependent upon shoppers' motivations and the type of retail establishments that are available locally. Darling and Tan have pointed out in their 1990 study that rural residents¹ are motivated to shop locally based on convenience and service. Most of the products that are purchased based on these motivational factors are classified as retail food and beverage products.

The purpose of this paper is two-fold. First of all, this paper analyzes whether counties, based on varying degrees of urbanization, are able to attract or retain more shoppers into their food and beverage

retail establishments relative to the county's other retail trade establishments. The second objective of this paper is to investigate whether retail sales trends for these various counties have continued to decline into the 1990s.

This study analyzed retail trade patterns for food and beverages, together with overall retail trade patterns, for six county classifications in Mississippi over four periods in time between 1985 and 1998. Pull factors were used to measure the ability of counties to attract and retain shoppers locally.

The results derived from this study could be of value to local business and civic leaders. Businessmen could benefit in terms of trying to determine the types of retail businesses that they could establish in their counties. Financial institutions could use this information, in conjunction with current industry measures, to assess project feasibility for loan processing. Local economic development agencies and chambers of commerce could utilize the results of this study to develop retail industry attraction and retention strategies. These strategies may aid them in local job creation and stemming the outflow of income to other communities and counties.

Methods and Procedures

In order to examine the ability of retail trade establishments to attract and retain shoppers, pull factors were estimated for counties of varying degrees of urbanization² in Mississippi. Pull factors, which derive its theoretical foundations from Central Place Theory, belong to a class of research tools known as Trade Area Analysis.³ Pull factors

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¹ This study was based on a survey of rural residents of the State of Kansas.

² These various county types are based on the USDA-ERS Rural-Urban Continuum Code.

³ Trade Area Analysis was developed by Stone and McConnon at Iowa State University in the late 1970s. These tools for analyzing local economic factors were later refined by Shaffer at the University of Wisconsin-Madison in the 1980s. Trade Area Analysis incorporates tools such as location quotients, population-employment ratios, retail market thresholds, potential sales, retail income surplus/leakages, trade area capture, and pull factors.

measure the relative strength of a county's retail trade industry by taking the ratio of the number of customers being served by the county's retail trade industry and the county's population. The larger the ratio value, the better the county's ability to attract and retain retail shoppers.

The first step in pull factor⁴ calculation is to obtain the number of customers served by the county's retail trade industry. This is accomplished by determining the *trade area capture* (TAC). TAC approximates the number of people who purchase goods and services from the county's retail trade establishments. TAC is estimated as follows:

$$\text{TAC} = \text{County Retail Sales} / [(\text{State per capita Retail Sales}) \times (\text{County per capita Income} / \text{State per capita Income})].$$

Once the TAC has been estimated, it is divided by the county's population to arrive at the county-level pull factor (PF).

$$\text{PF} = \text{Trade Area Capture} / \text{County Population}.$$

where PF can take on the following values:

PF < 1 County's retail sector is unable to retain resident shoppers⁵.

PF > 1 County's retail sector is able to attract additional shoppers⁶.

PF = 1 County's retail sector is neither gaining or losing shoppers.⁷

Mississippi county level pull factors for 1985, 1989, 1994, and 1998 were estimated for the food and beverage retail sector and the overall retail trade industry. This estimation across time

and sector lends a temporal perspective into retail trade sales patterns by type of retail activity. Appendix Table 1 provides the types of establishments that comprise the food and beverage retail sector in Mississippi. The same table also designates the types of retail establishments that comprise the overall retail trade industry in the state.

Information used in calculating pull factors for this study was derived from several sources. Data on population estimates for the above mentioned years were taken from the U.S. Census Bureau. Retail sales estimates⁸ for these four time periods were obtained from the Mississippi State Tax Commission. To overcome this deficiency, per capita personal income⁹ is used in lieu of disposable income. Per capita personal income information is obtainable at the county level. Information was obtained from the Bureau of Economic Analysis.

Upon calculation of pull factors for each county, the eighty-two counties in Mississippi were categorized according to a rural-urban continuum. This continuum, based on the United States Department of Agriculture's Rural-Urban Continuum Code¹⁰, classifies Mississippi counties into one of six county types. Appendix Table 2 provides a description of these six county types. Once counties have been grouped according to county type, pull factors were averaged to arrive at county-type pull factors. These county type pull factors provide several inferences regarding retail sales patterns across areas of varying degrees of urbanization.

Analysis of Food and Beverage Retail Trade Pull Factors by County Type

Table 1 presents the mean food and beverage retail trade pull factors from 1985 to 1998 for the six county types in Mississippi. The table shows that *metropolitan* and *non-metropolitan, non-*

⁴ There are several variations on the mathematical formulation of pull factors. For the purpose of this analysis, the equations presented by Miller were utilized.

⁵ If PF = 0.80, this means that only 80 percent of the county's population shops in local retail establishments.

⁶ If PF = 1.10, this means that the number of shoppers in the county exceed the county's population by 10 percent. This means that the county's retail establishments are able to retain local shoppers and bring in non-resident shoppers.

⁷ At this PF value, total area capture (number of shoppers who shop at local establishments) is equal to county population. It is assumed that all county residents shop locally.

⁸ Retail sales and per capita personal income were reported in current dollars.

⁹ In most circumstances, disposable income is a better variable to use for analyzing retail sales purchases. Since the current study analyzes retail sales at the county level, disposable income information is not readily available at this geographic level. It is reported at the state level.

¹⁰ The USDA-ERS rural-urban continuum classifies counties into 10 categories ranging from metropolitan counties (with populations of 1 million or more) to completely rural counties (with fewer than 2,500 residents in the county's towns).

Table 1. Mean Pull Factors For Food And Beverage Retail Trade Sector.

County Type			Pull Factor			
			1985	1989	1994	1998
Metropolitan (Metro)			1.00	1.01	1.02	1.00
Non-Metro	Adjacent to Metro		0.97	0.89	0.89	0.89
	Non-Adjacent to Metro	Trade Center	1.10	1.16	1.10	1.09
		Non-Trade Center	0.97	0.96	0.94	0.96
Rural	Adjacent to Metro		0.66	0.60	0.58	0.57
	Non-Adjacent to Metro		0.78	0.70	0.68	0.74

adjacent, trade center counties have greater than 1 pull factors for the food and beverage retail sector. This means that these county types have been able to attract and retain more shoppers locally than the other four county types.

In each of the years for which food and beverage retail trade pull factors were estimated, the average *metropolitan* county and the average *non-metropolitan, non-adjacent, trade center* county exhibited pull factors equal to or greater than one. This meant that counties of this type did not lose nor gain any shoppers in their retail food and beverage establishments¹¹ or these counties gained shoppers above their resident population¹².

The average *metropolitan* county encountered relatively stable food and beverage retail trade pull factors between 1985 and 1998. In 1985 and 1998, the average *metropolitan* county did not gain non-resident shoppers nor lose its resident population to out-of-county food and beverage retail establishments. However, in 1989 and 1994, the average county in this county-type, experienced slight increases in non-resident shoppers. These increases were 1 percent and 2 percent above resident populations in 1989 and 1994, respectively.

The average *non-metropolitan, non-adjacent, trade center* county experienced gains in the number of shoppers from approximately 10 percent above the resident population in 1985 to 16 percent above resident population in 1989. In 1994 and 1998, these gains have slowly eroded to 10 percent and 9 percent above resident population, respectively.

County types¹³ that were adjacent to *metropolitan* counties experienced out-of-county food and beverage retail purchases by their residents. Given these counties' proximity to their *metropolitan* counterparts, it was assumed that some residents of *non-metropolitan-adjacent* and *rural-adjacent* counties conducted their food and beverage retail purchases in retail establishments in the neighboring *metropolitan* county.

Food and beverage retail trade pull factors from 1985 to 1998 show that approximately 90 percent¹⁴ of residents of *non-metropolitan adjacent* counties and roughly 60 percent¹⁵ of residents in *rural adjacent* counties shopped at local retail establishments. It is inferred that the remaining percentage of resident population in these counties shopped in the adjacent *metropolitan* county.

Counties classified as *non-metropolitan, non-adjacent, non-trade center* experienced minimal outflows of resident shoppers from 1985 to 1998. In 1985, roughly 3 percent of county residents shopped outside of the county for food and beverage retail purchases. This trend increased to 4 and 6 percent in 1989 and 1994, respectively, before rebounding back to 4 percent resident shopper outflow in 1998. Given these counties' proximity to *non-metropolitan, non-adjacent, trade center* counties, it is hypothesized that resident shoppers in the former county type shop in retail establishments in the latter county type.

¹³ These represent the *non-metropolitan-adjacent* and *rural-adjacent* counties.

¹⁴ Average for the four years under consideration.

¹⁵ Average of retail food and beverage pull factors from 1985 to 1998.

¹¹ In the case where PF = 1.

¹² In the case where PF > 1.

Analysis of Overall Retail Trade Pull Factors by County Type

A perusal of Table 2 shows that counties that are *non-metropolitan, non-adjacent, trade centers* were the only counties that experienced inflows of out-of-town shoppers into its retail trade establishments. Counties classified under the remaining five categories experiences outflows of resident shoppers.

Despite the perception that *metropolitan* counties attract shoppers due to their preeminence as retail trade centers, counties of this type in Mississippi were not able to retain all of their residents to shop in local establishments. From 1985 to 1998, approximately 5 percent of the residents of a county of this type shopped outside the county. This was evidenced by less than one pull factors¹⁶ for each of the years under consideration.

In terms of overall retail trade, the percentage of residents of *non-metropolitan-adjacent* and *rural-adjacent* counties that shopped outside their counties of residence were higher than in the case of food and beverage retail sales. *Non-metropolitan-adjacent* counties were not able to satisfy the retail needs of approximately one-third of their residents. On the other hand, close to half of the residents in *rural-adjacent* counties made retail purchases outside their counties of residence.

Residents of *non-metropolitan, non-adjacent, non-trade center* and *rural, non-adjacent* counties experienced greater out-of-county shopping by its residents in the case of overall retail trade. The average *non-metropolitan, non-adjacent, non-trade center* county lost a little over 20 percent of its residents to out-of-town retail trade establishments. On the other hand, the average *rural, non-adjacent* county saw a steady decline in the percentage of its resident population that shopped locally from 1985 to 1998.

Comparison of Food and Beverage Retail Sector and Overall Retail Trade Mean Pull Factors

Based on the results of pull factor calculations for the food and beverage retail sector and

the overall retail trade industry in Mississippi, it was evident that estimated pull factors for in the food and beverage retail trade sector were higher for all county types except the *non-metropolitan, non-adjacent, trade center*¹⁷ county type. These higher pull factors imply that the food and beverage retail sector had a greater likelihood of allowing residents to shop locally than the overall retail trade industry. The larger food and beverage retail sector pull factors are indicative of the results of the study conducted by Darling and Tan.

Analysis of Retail Sales Over Time

As noted above, earlier studies have shown a trend in declining retail sales in rural America during the 1980s. Mississippi counties of varying degrees of urbanization have not been immune to this predicament. What is interesting to note is that these declining trends differ based on county type. Table 3 presents the change in mean county type pull factors for the food and beverage retail sector and the overall retail trade industry from 1985 to 1998.

In the case *metropolitan* counties, while pull factors for the food and beverage retail sector and the overall retail trade industry have remained stable over the four years under consideration, the decline in retail sales from 1985 to 1998 have been larger in the food and beverage sector. Table 3 shows that, despite the larger food and beverage retail sector pull factors, this sector has experienced a 0.25 percent decline as opposed to the 0.02 percent decline in the overall retail trade industry from 1985 to 1998. This is the only county type that exhibited larger declines in the food and beverage retail sectors than in the overall retail trade industry.

The three non-metropolitan county types exhibited declines in pull factors in both retail trade categories. The *non-metropolitan-adjacent* county type showed the largest decreases in pull factors for both retail trade categories. In terms of the food and beverage retail sector, the *non-metropolitan-adjacent* county type experienced a sharp decline from a PF value of 0.97 in 1985 to a PF value of 0.89 in 1989. This lower PF value was maintained for 1994 and 1998. In terms of the overall retail trade industry, this county type saw a steady decline in pull factors from 0.78 in 1985 to 0.70 in 1998.

¹⁶ This does not mean that residents of other county types did not shop in *metropolitan* counties. It is feasible that residents of *non-metropolitan* and *rural* counties shopped in *metropolitan* county retail trade establishments. Given this possibility, it is also possible that more than 5 percent of *metropolitan* county residents shopped outside their county of residence.

¹⁷ While pull factor analysis does not provide information regarding consumer motivation, it is speculated that the reason for the higher overall retail trade industry pull factors in this county type is due to the method of estimating these pull factors.

Table 2. Mean Pull Factors For Overall Retail Trade Industry.

County Type			Pull Factor			
			1985	1989	1994	1998
Metropolitan (Metro)			0.94	0.95	0.95	0.94
Non-Metro	Adjacent To Metro		0.78	0.73	0.73	0.70
	Non-Adjacent To Metro	Trade Center	1.13	1.19	1.10	1.07
		Non-Trade Center	0.83	0.82	0.81	0.84
Rural	Adjacent To Metro		0.55	0.50	0.43	0.40
	Non-Adjacent To Metro		0.64	0.54	0.47	0.50

Table 3. Percentage Change In Pull Factors From 1985 Through 1998.

County Type			Percentage Change From 1985 To 1998	
			Food & Beverage	Overall Retail
Metropolitan (Metro)			-0.25%	-0.02%
Non-Metro	Adjacent to Metro		-9.07%	-10.05%
	Non-Adjacent to Metro	Trade Center	-0.83%	-5.25%
		Non-Trade Center	-0.47%	0.64%
Rural	Adjacent to Metro		-12.81%	-27.56%
	Non-Adjacent to Metro		-4.73%	-21.50%

Based on the pull factor estimations from 1985 to 1998, rural county types experienced the largest declines over the time period under consideration. *Rural-adjacent* counties posted the highest declines in both retail trade categories. On the other hand, *rural-non-adjacent* counties recorded a large decrease in the overall retail trade category as opposed to the food and beverage retail sector. It should be noted that declines in the overall retail trade were higher than in the food and beverage retail sector for both rural county types.

Implications

In the introduction to this paper, it was stated that the objectives of this paper were two-fold. The first objective was to determine whether counties of varying degrees of urbanization could attract or retain more shoppers in their food and

beverage retail sectors than in the other retail sectors in the county. Evidence from the estimation of pull factors for both retail categories showed that counties, irrespective of their urbanization status, were able to attract more people into their food and beverage retail sector than in the overall retail trade industry. This result typified the findings of previous studies regarding consumers' propensity to shop locally for food and beverage items based on the factors of convenience and service.

The second objective of this paper was to determine whether the declining retail sales trend of the 1980s has permeated into the 1990s. Again, estimation of pull factors from 1985 to 1998 has shown varying rates of decline in retail sales based on county type. Non-rural counties, which posted decreasing retail sales over the time period studied, experienced smaller percentage decreases in retail sales as opposed to rural counties.

Given the myriad of economic problems surrounding rural communities, the encouragement or support provided to retail establishments in these communities does not go unrewarded. While it is not a guarantee that residents will not shop outside of the county, maintaining a viable retail trade industry can help stem the outflow of dollars from the community.

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Appendix Table 1. Types Of Establishments That Comprise The Mississippi Food & Beverage and Overall Retail Trade Sectors Used in the Current Study.

Sector		Types Of Establishments
Food And Beverage		(1) Grocery Stores (General); (2) Quick Stop Grocery Stores; (3) Meat, Poultry And Fish Products; (4) Specialty Food Related Stores; (5) Liquor Stores (Package Stores And Bars); (6) Concession Stands, Quick Food Stores, And Ice Cream Parlors; And, (7) Restaurants And Cafes (Serving Alcoholic And/Or Non-Alcoholic Beverages).
Overall Retail Trade	Automotive	(1) New And Used Automobile Dealers; (2) Auto Repair (New Car Dealers); (3) Auto Parts, Tires, And Accessories; (4) Automotive Repair Shops; (6) Gasoline Service Stations; (7) Automotive Parking Lots And Garages; (8) Car Washes; (9) Motorcycle Dealers And Repair; (10) Trailer Dealers; (11) Aircraft Dealers; And, (12) Automotive Related Retail, Not Elsewhere Classified (Nec).
	Furniture & Fixtures	(1) Furniture Stores; (2) Appliance Stores; (3) Music Stores; (4) Business Furniture, Equipment, And Supplies; And, (5) Furniture Repair Stores.
	Apparel & General Merchandise	(1) Department Stores; (2) Automotive Merchandising; (3) Direct Selling; (4) Men's And Boys' Clothing Stores; (5) Ladies Ready-To-Wear Apparel Stores; (6) Children And Infants Apparel Stores; (7) Shoe Stores; (8) Apparel And Accessory Stores; And, (9) General Merchandise, Nec.
	Lumber & Building Materials	(1) Building Materials (Hardware); (2) Lumber And Other Building Materials; (3) Plumbing, Heating, And Air Conditioning; (4) Hardware Stores; (5) Fence Dealers; (6) Neon And Other Signs; (7) Monuments And Tombstones; (8) Saw Mills And Wood Preservings; (9) Electrical Work; (10) Tin, Sheet Metal, And Fabric; And, (11) Tile Setting.
	Misc. Retail	(1) Agricultural Services; (2) Drug Stores; (3) Antique And Second Hand Stores; (4) Sporting Goods And Bicycles; (5) Jewelry Stores; (6) Florists; (7) Camera And Photographic Supplies; (8) Printing And Publishing; (9) Advertising Specialists And Supplies; (10) Mining (Metal, Sand, Gravel); (11) Medical And Dental Supplies; (12) Book And Stationery Stores; (13) Farm And Garden Supplies; (14) Fuel And Ice Dealers; (15) Cigar Stores And Stands; (16) Gift, Novelty, And Souvenir Stores; (17) Sales To Electric Power Utilities; And, (18) Miscellaneous Retail, Nec.

Source: Mississippi State Tax Commission, *Annual Reports*, Various Issues.

Appendix Table 2. Modified Rural-Urban Classification of Mississippi Counties.

County Type		Description	Number Of Counties	Counties
Metro		County Within A Metropolitan Statistical Area (Msa).	7	De Soto, Hancock, Harrison, Hinds, Jackson, Madison, & Rankin
		County Population Ranges From 250,000 To 1 Million Or More.		
Non Metro	Adjacent	Non-Metropolitan County Adjacent to Msa County.	14	Attala, Copiah, George, Holmes, Leake, Marshall, Pearl River, Scott, Simpson, Stone, Tate, Tishomingo, Warren, & Yazoo
		County's Urban ¹⁸ Population Ranges From 2,500 To 250,000.		
	Not Adjacent Trade Center	Non-Metropolitan County That Is Not Adjacent to Msa County.	8	Adams, Bolivar, Forrest, Jones, Lauderdale, Lee, Lowndes, & Washington
		County's Urban Population Ranges From 2,500 To 250,000.		
		County Contains A City/Town That Serves As A Regional Trade Center ¹⁹		
	Not Adjacent Non-Trade Center	Non-Metropolitan County That Is Not Adjacent to Msa County.	29	Alcorn, Chickasaw, Clarke, Clay, Coahoma, Covington, Grenada, Humphreys, Itawamba, Lafayette, Lamar, Leflore, Lincoln, Marion, Monroe, Montgomery, Neshoba, Newton, Oktibbeha, Panola, Pike, Pontotoc, Prentiss, Sunflower, Tishomingo, Union, Wayne, Winston, & Yalobusha
		County's Urban Population Ranges From 2,500 To 250,000.		
Rural	Adjacent	Rural County Adjacent To Msa County.	5	Benton, Claiborne, Greene, Smith, & Tunica
		County's Urban Population Is Less Than 2,500.		
	Not Adjacent	Rural County That Is Not Adjacent To Msa County.	19	Amite, Calhoun, Carroll, Choctaw, Franklin, Issaquena, Jasper, Jefferson Davis, Jefferson, Kemper, Lawrence, Noxubee, Perry, Quitman, Sharkey, Tallahatchie, Walthall, Webster, & Wilkinson
		County's Urban Population Is Less Than 2,500.		

NOTE: Classification based on USDA-Economic Research Service's Rural-Urban Continuum Code.

¹⁸ Urban refers to the county's major town(s) or city(s).¹⁹ Based on classification in Rand McNally's 1996 Commercial Atlas and Marketing Guide.