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Murray D. Rice, Anthony Ostrander & Chetan Tiwari

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Decoding the Development Strategy of a Major Retailer: Wal-Mart's Expansion in the United States

Murray D. Rice, Anthony Ostrander, and Chetan Tiwari
University of North Texas

This research aims to provide insight regarding Wal-Mart's retail development strategy in its expansion across the continental United States. The study examines store location patterns and relationships between Wal-Mart's store and distribution center locations and markets. The study shows that, although radial expansion is broadly characteristic of the dense store patterns that have been well established for Wal-Mart at the national level, expansion patterns at the regional level are consistent with a selective process based on factors other than store density. These results provide a new perspective on Wal-Mart's expansion, providing insights of value to retail practitioners and local government. **Key Words:** distribution center location, location intelligence, retail chain expansion, store location, Wal-Mart.

本研究旨在对于沃玛在美国大陆扩张的零售店发展策略提供洞见。本研究检视商店区位模式，以及沃玛的商店与配送中心区位和市场之间的关系。本研究显示，儘管沃玛在全国层级完整建立的密集商店模式，以激进扩张为其显著特色，但区域层级的扩张模式，却吻合根据商店密度之外的因素之选择过程。这些研究结果，对于沃玛的扩张提供了崭新的视野，对于零售业从业者与地方政府亦提供了具有价值的洞见。 **关键词:** 配送中心区位, 区位智能, 零售店扩张, 商店区位, 沃玛。

Con esta investigación se pretende lograr una mayor compenetración con la estrategia de desarrollo del mercadeo al por menor de Wal-Mart en su proceso de expansión a través de los Estados Unidos continentales. El estudio examina los patrones de localización de las tiendas y las relaciones entre éstas y la distribución de localizaciones de centros y mercados de Wal-Mart. El estudio muestra que, aunque la expansión radial es ampliamente característica de los densos patrones de tiendas ya bien establecidos para Wal-Mart a nivel nacional, los patrones de expansión a nivel regional son consistentes con un proceso selectivo basado en factores diferentes de la sola densidad de tiendas. Estos resultados proveen una nueva perspectiva de la expansión de Wal-Mart, proporcionando valioso entendimiento a quienes manejan el comercio al menudeo y al gobierno local. **Palabras clave:** localización del centro de distribución, inteligencia locacional, expansión de la cadena de menudeo, localización de tiendas, Wal-Mart.

The retail environment has undergone many important changes over the past fifty years. Cities, shopping venues, and retail businesses have all altered in form and function in a variety of important ways. North America's major metropolitan areas have continued to spread and evolve (Millward and Bunting 2008), creating new, regional retail opportunities while seeing the decline of many older communities. Shopping infrastructure has developed along with broader urban changes, evolving from unplanned clusters through climate-controlled shopping malls (Dickinson and Rice 2010); retail power centers, mall transformations, and new urban developments (Finn and Timmermans 1996; Bartlett 2003; Lorch and Hernandez 2008); and on to the modern realities of online commerce (Hernandez, Gomez-Insauti, and Biasiotto 2001; Wrigley and Currah 2006). In terms of business change, 1962 alone saw Target, Kmart, and Wal-Mart each open their first discount stores in

Minneapolis, Detroit, and Rogers, Arkansas, respectively (Graff 2006). Other important developments in recent decades have included the failure of large retailers such as Montgomery Ward (in 2001) and Circuit City (in 2006), the growth of online retailers such as Amazon and eBay, and the revolutionary impacts of locationally enabled smartphone applications. The historical record demonstrates that the retail sector is highly competitive, making the discovery of even the smallest advantage a matter of great importance.

Wal-Mart is one business that from many perspectives has achieved a plethora of competitive advantages. Wal-Mart's ascent from obscurity in northwestern Arkansas to become the world's largest retailer is one of the greatest business achievements in U.S. history. One distinctive element of Wal-Mart's success has been its geographic strategy: By initially locating in small and relatively remote markets, Wal-Mart exploited a niche that was not well served by its larger

competitors (Graff 1998, 2006). Wal-Mart has consistently demonstrated a high degree of location intelligence through its network development.

Wal-Mart provides a compelling retail case study because of its rapid expansion and success. Its achievements and distinctive network development strategies make Wal-Mart an important study focus for researchers and practitioners looking to understand its accomplishments. Of course, it is important to acknowledge that Wal-Mart's innovations are not limited to geography (Gereffi and Christian 2009), that Wal-Mart's achievements have not gone without challenge (Basker 2005; Goetz and Swaminathan 2006; Jia 2008; Paruchuri, Baum, and Potere 2009), and that Wal-Mart's reputation has been affected by operational challenges (Loeb 2013; Rosenblum 2014). Even given a complex and contested business record, however, it remains important to ask this: Have the geographic bases of Wal-Mart's success been adequately enumerated?

Thus, this study concentrates on analysis of Wal-Mart's network development. Such an objective relating to a single business might not be warranted if the focus was a less consequential firm. Given Wal-Mart's enormous impacts, however, research into its strategy is of broad relevance to business geographers, planners, and others interested in regional economic development. Therefore, the results presented here aim to build on the retail literature by identifying underlying relationships between factors internal to Wal-Mart: store types, locations, openings, and store-to-distribution center distances. The study also contributes to the literature of geography by encompassing selected demographic factors in the analysis. In total, the study aims to enhance our understanding of Wal-Mart's development strategy. Before addressing this contribution, though, the study begins by surveying previous research.

Retail Foundations

The modern retail landscape continues to undergo pervasive and far-reaching change. The list of retailers that have gone through important transformations over the past decades is long, as North American cornerstones such as Montgomery Ward, Kmart, Eaton's, May, Circuit City, Safeway, Future Shop, and Radio Shack have all seen major transitions in the form of bankruptcies, reorganizations, mergers, and acquisitions. Although the specifics surrounding each firm are unique, one element cuts across all cases: the centrality of geography to retail (Birkin, Clarke, and Clarke 2002; Wrigley and Lowe 2002). An understanding of geography is essential to retail planning.

Retail geography has a long tradition of business research and application. The seminal contributions of Lösch (1954) and Christaller (1966) to the central place literature form a foundation that set an early precedent for retail investigation. Lösch's focus on service location optimization, versus Christaller's emphasis on

explanation for existing service location patterns, set in place a dual set of priorities that continue to characterize much research in the field. Over time, theoretical and empirical research in retail geography has changed in response to the development of retail activity and the evolving matrix of urban development that forms the context for modern retail activity. For example, through the 1980s, research in retail geography followed the spatial science tradition, emphasizing the creation of quantitative models to determine retail locations and estimate trade areas and store impacts (Schapker 1956; Pratt and Pratt 1960; Huff 1964; Applebaum 1966; Bucklin 1967; Huff and Rust 1984; Berry et al. 1988). This emphasis provided many practical insights to the retail industry, but it also limited the nature of questions addressed by geographic research to issues amenable to quantitative modeling. Thus, in response to these limitations, research in retail geography has broadened its focus in line with developments in economic geography more broadly (Bagchi-Sen and Lawton Smith 2006). Contemporary retail geography investigation continues to deal with store locations and markets but within an ever-widening context including regulation, expansion, and corporate strategy (Wrigley and Lowe 2002; Coe and Wrigley 2007; Lowe and Wrigley 2010).

Given the turbulence characterizing retail, research related to corporate strategy is important. A particularly prominent branch of investigation has focused on expansion strategies (Laulajainen 1987, 1988; Graff and Ashton 1994; Graff 1998, 2006). Expansion of multinational retailers is well represented in contemporary research (Coe and Hess 2005; Coe and Lee 2006; Coe and Wrigley 2007; Lowe and Wrigley 2010), but chain growth at the national level is also important, as domestic success is a precondition for international advancement. From this national and regional perspective, Thrall (2002) provided a detailed accounting of the analytical and judgmental process that accompanies the expansion of a retail or service chain. Although such a depiction of the expansion process is of immense value from a "best practice" vantage, case study evidence defining the expansion process for successful firms can also contribute strategic understanding. Thus, analysis of chains making the transition from regional to national status is necessary, and investigation into prosperous chains such as Wal-Mart contributes to the discovery and dissemination of the principles that lead to business success.

Indeed, Wal-Mart's location decisions have been the subject of significant scholarly attention (Stone 1997; Brunn 2006; Goetz and Swaminathan 2006; Graff 2006; Basker 2007; Dean and Sobel 2008; Hicks 2008; Jia 2008; Holmes 2011; Merriman et al. 2012). This body of research provides empirical evidence noting Wal-Mart's impacts on local markets. Additionally, much of the literature focuses on identifying and overcoming endogeneity. Because reliable data sets concerning wages, education, benefits, and

employment are difficult to obtain, results tend to be misleading or incomplete with regard to any determination of Wal-Mart's net impact on any given market area. Hicks (2008) suggested that more research on demographic characteristics and store location is needed to understand Wal-Mart's impacts and development strategy.

Laulajainen (1987, 1988), Graff and Ashton (1994), and Graff (1998, 2006) directed geographic attention to Wal-Mart's expansion strategies in particular. Graff (1998) analyzed Supercenter site selection decisions and methods through the 1990s. He found that Wal-Mart's strategy for opening its Supercenter stores followed the same expansion pattern used for the development of the company's first-generation discount store network between 1962 and 1990, beginning in Wal-Mart's Arkansas base and expanding in a radial manner from there. Both Laulajainen (1988) and Graff and Ashton (1994) characterized Wal-Mart's overall location strategy as being distinctive in comparison with other retailers, with a focus on establishing its small-town core before expanding to regional markets elsewhere. Reinforcing this point, Holmes (2011) and Joseph and Lee (2011) separately identified the wave-like patterns associated with Wal-Mart's growth strategy radiating out from its Arkansas base, with Holmes (2011) going even further in defining the efficiencies Wal-Mart gained related to its employment of a dense network of store locations. Indeed, Holmes in particular emphasized the centrality of store density to Wal-Mart's highly efficient expansion strategy, summarizing the chain's historical location practice as "Wal-Mart always placed new stores close to where it already had store density" (Holmes 2011, 253). Overall, the retail location literature makes a clear connection between Wal-Mart's dense store network and the firm's drive to reduce distribution costs.

Despite the agreement apparent in the overall body of Wal-Mart store location research, important gaps still exist. In particular, Wal-Mart's distribution network has not been the subject of sufficient academic examination. Holmes's (2011) investigation is the sole study that includes distribution centers in its analysis, providing the conclusion that density remains central to Wal-Mart's national strategies. For all retailers, however, a need remains to further integrate distribution into contemporary retail research, including analysis of how complex and integrated retail systems have evolved over time. This study explores this important logistical connection.

Case Study

This case study analyzes Wal-Mart's U.S. expansion from 1990 to 2005. The first study year, 1990, falls at the beginning of a large-scale store format conversion process. The final study year, 2005, marks the approximate time when Wal-Mart's expansion had reached across the country. By this point, the company's U.S.

location priorities had begun to substantially shift from new market entry into revisiting remaining location opportunities in regional markets already served at some level by the company. Thus, the study follows Wal-Mart's activities over the 1990 to 2005 period to track the firm's detailed geography of store and distribution center development that saw the chain expand across the country.

To understand this expansion, it is important to define the three Wal-Mart store types that form the study focus.

1. *Original discount stores* are stores designed to offer a broad spectrum of general merchandise, including offerings in the home and garden, electronics, automotive, and apparel categories, together with a limited food selection.
2. *Original Supercenter stores* are stores designed to offer everything provided by discount stores together with a large and extensive selection of grocery items.
3. *Converted to Supercenter stores* are stores originally constructed in a discount format that were expanded into a Supercenter format (the conversion process cited earlier).

In parallel with stores being classified by type, it is also important to recognize the two kinds of Wal-Mart distribution centers.

1. *Standard distribution centers* supply original discount stores, original Supercenter stores, and converted to Supercenter stores with the general merchandise defined under the discount store class.
2. *Grocery distribution centers* supply original Supercenter stores and converted to Supercenter stores with food items.

Table 1 and Figure 1 provide some background for understanding Wal-Mart's 1990 through 2005 retail expansion. Table 1 breaks down store types and conversions by region, illustrating regional differences in Wal-Mart's store format choices. Figure 1 highlights the extent to which Wal-Mart has increased its expansion and conversion activity, while also modifying its approach over time. Figure 1 makes it apparent that this change has been characterized by a shift in orientation from discount store openings to Supercenter openings and discount store to Supercenter conversions. The geography of this change is not addressed in Figure 1, however. The remainder of this analysis focuses on pursuing the geographic analysis in greater detail.

Research Questions

Wal-Mart's national operations are sufficiently complex to make it difficult to identify regional tendencies by store type. Most regions have a retail mix that is composed of a variety of Wal-Mart store types. When

Table 1 Number of stores by type in each region, 2005 (total number of stores and percentage of total stores by region)

Region	Original discount stores	Supercenter stores			All stores
		Original	Converted	Original and converted (total)	
Northeast	212 (67%)	59 (19%)	45 (14%)	104 (33%)	316 (100%)
Midwest	203 (34%)	106 (18%)	287 (48%)	393 (66%)	596 (100%)
South	128 (12%)	249 (22%)	736 (66%)	985 (88%)	1,113 (100%)
West	209 (51%)	79 (20%)	120 (29%)	199 (49%)	408 (100%)
All regions	752 (31%)	493 (20%)	1,188 (49%)	1,681 (69%)	2,433 (100%)

Note: Italicized entries indicate the largest store type in each region (out of the original discount, original Supercenter, and converted Supercenter store types).

this mix is combined with an increasingly dense national network of stores, clear observations become elusive. Furthermore, because Wal-Mart's network is large, a geographic analysis of change (e.g., which regions have seen their discount stores upgraded more or less rapidly to Supercenter status) has not been attempted. Thus, the first objective of this study is to fill these gaps by identifying the locational patterns associated with each store type. Specifically, the study investigates the geography of the three Wal-Mart store types. Given Wal-Mart's radial expansion pattern (Graff and Ashton 1994; Graff 1998), a logical expectation is that store development behavior might differ between Wal-Mart's historic Arkansas core and distant regions that Wal-Mart has more recently entered.

Building on the preceding, the second research objective is to investigate the store development patterns observed relative to Wal-Mart's distribution network. The primary focus is the relationship between store opening year and the store's nearest distribution center distance. This second question probes whether Wal-Mart opened its stores in a continuous, radial fashion outward from each distribution center at the regional level (i.e., stores being developed close to the distribution center first, then built progressively further away until the distribution center's service area is fully populated). This would follow from Wal-Mart's established emphasis on store density (Graff 1998; Holmes 2011).¹

The third and final question in this study investigates whether the site selection process for a new Wal-Mart store relates to specific demographic triggers. This final, exploratory question responds to Hicks's (2008) identification of demographic triggers as an important direction for further investigation, with the idea being that specific market characteristics might be associated with the opening of new Wal-Mart stores. Thus, the study investigates this general premise using a short series of basic population variables, namely, average household income, population density, and unemployment rate. These variables were selected based on past studies demonstrating Wal-Mart's rural and small-town initial orientation (Graff and Ashton 1994; Graff 1998). Additionally, Holmes (2011) addressed the issue of Wal-Mart store location and population density directly, suggesting that the Wal-Mart store model might not work as well in highly urban settings. Following on these precedents, the analysis aims to provide evidence indicating whether Wal-Mart's small-town orientation has continued through its expansion.

Data

The study database, consisting of facility locations and opening date information, comes from Holmes (2010). Holmes assembled a comprehensive data set of Wal-Mart stores and distribution centers opened from 1963 through January 2006. Holmes (2010) indicated that this data set is a compilation from several sources, including Wal-Mart's own store records, store directories compiled by Basker (2005), and distribution center information from Wal-Mart's required filings with the Environmental Protection Agency and from Matterna and Purinton (2004). As mentioned earlier, this study focuses only on the 1990 to 2005 data subset.

One key limitation of the Holmes (2010) database is important to note: It captures store openings and conversions (i.e., from discount store to Supercenter), but it does not include information on store closures. Given the overwhelming business success of Wal-Mart, store closures have been a secondary factor at best over the initial decades of the firm's existence.² It

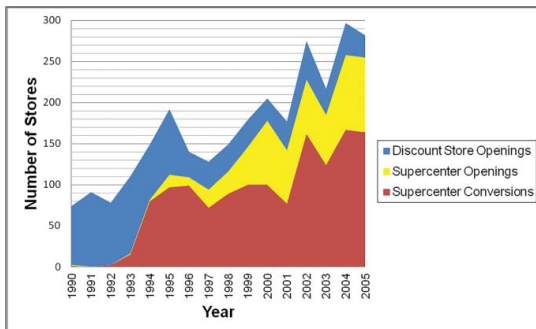


Figure 1 National Wal-Mart store openings and conversions by year, 1990–2005. (Color figure available online.)

is also important to acknowledge, however, that an absence of store closure information constitutes a database weakness that is difficult to address (e.g., Wal-Mart announces store openings through press releases published on its Web site but not store closures). Thus, for purposes of this research, this study makes the necessary assumption that stores opened by Wal-Mart at any point remain open in succeeding years. Store closures are not addressed here but remain a viable area for further research, particularly as Wal-Mart's store network continues to mature.

Each Wal-Mart store and distribution center address included in the study was geocoded using the Alteryx Street Geocoder. Because of the importance of an accurate store location determination to other components of the study analysis (the market area demographic analysis in particular), only those locations that could be encoded at a 100 percent accuracy rate were used (meaning that the address, city, state, and five-digit ZIP code of a given store record all received an exact match with the street database). Of the 2,804 stores included in the original data set, 2,433 (86.7 percent of all stores) received a 100 percent address match and were thus included in the analysis.

Store and distribution locations were also analyzed at the regional level using the U.S. Census Bureau's Census Region definition (see Figure 2). Completing this analysis gives the study the ability to discern major regional variations in store location patterns.

Demographic data for investigation of the third research question came from 1990 and 2000 Census data, provided at the block level. Block-level data were used because of their high level of geographic detail. Block-level data in this analysis were analyzed by constructing five-mile radius zones around each Wal-Mart store location. Holmes (2011) provided a precedent by using five-mile trade areas in his related study. Use of such zones provides a foundation for local trade area characteristic determination.³

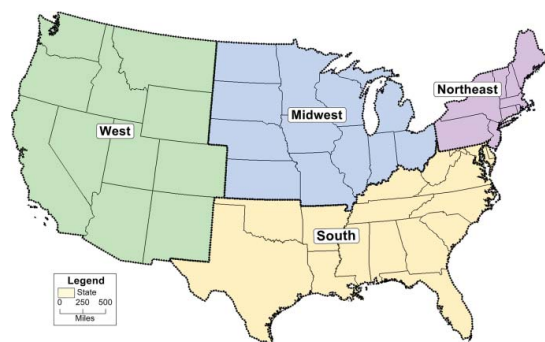


Figure 2 Continental U.S. census regions for analysis. (Color figure available online.)

Results

Question 1: Wal-Mart Store Clustering

The first question investigates all Wal-Mart stores opened between 1990 and 2005, with the goal being to investigate differences in Wal-Mart store clustering behavior nationwide. To investigate store clustering, the analysis employs the “hot spot” methodology, where the hot spot term refers to an area with an unusually high occurrence of point incidents (Lu 2000). Hot spot analysis has been used extensively in spatial epidemiology (R. C. Jones et al. 2006; Osei and Duker 2008), but the ability of this method to identify statistically significant clusters of point-based activity suggests that hot spot analysis has much potential for contribution elsewhere, including retail (Nakaya and Yano 2010). In this study, hot spots were generated using continuous scan statistics as implemented in the SaTScan statistical analysis package (Kulldorff 2010). Continuous scan statistics search for the existence of point clusters, such as store groupings, located throughout a given study area (Kulldorff 1997, 2010). As implemented here, hot spot analysis identifies store clusters that significantly differ from the random pattern that would be obtained from the operation of a homogeneous Poisson process.

Using this methodology, the analysis here identifies fifteen hot spots (for all three store types) significant at the $p = 0.01$ level. This analysis was limited to hot spots encompassing a maximum of 20 percent of all stores in each of the three store type groups. This choice focuses attention on the regional structure of Wal-Mart's store network and avoids considering even larger, superregional hot spots that could mask more detailed regional structure. Figures 3, 4, and 5 illustrate hot spot locations for the three store types. These maps collectively reflect the unique geographies characterizing each of the three store types. Even with the 20 percent store limitation, major regional hot spots still emerge. Discount stores (Figure 3) are associated with large hot spots in the Northeast and Upper

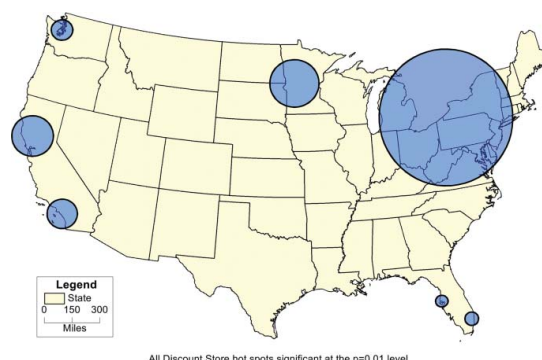


Figure 3 Original discount store hot spots, 2005. (Color figure available online.)

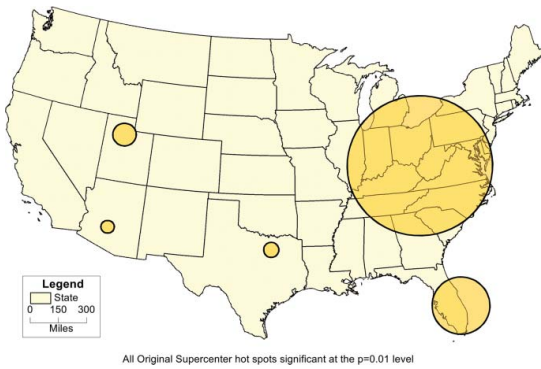


Figure 4 Original Supercenter store hot spots, 2005. (Color figure available online.)

Great Plains, as well as other smaller hot spots located on the Pacific coast and Florida. These hot spots coincide with many of the largest metropolitan areas in the country. Original Supercenters (Figure 4) have a large hot spot encompassing the Mid-Atlantic and Midwest regions, with smaller hot spots located across the Sunbelt. The three large hot spots associated with converted Supercenters (Figure 5) are focused in the eastern half of the country, with the largest encompassing Wal-Mart's Arkansas base and neighboring states. Overall, the hot spot patterns observed here might be linked with three key factors:

1. The development of Wal-Mart's store formats (beginning with its original discount format, proceeding to new Supercenter development, and finally progressing to discount-to-Supercenter conversion).
2. The spatial evolution of Wal-Mart's store network (radiating outward from Arkansas).
3. The characteristics of the national urban system (with the largest metropolitan areas and most expensive real estate in the country being located along the East and West Coasts, with young and fast-growing urban areas being located in the South).

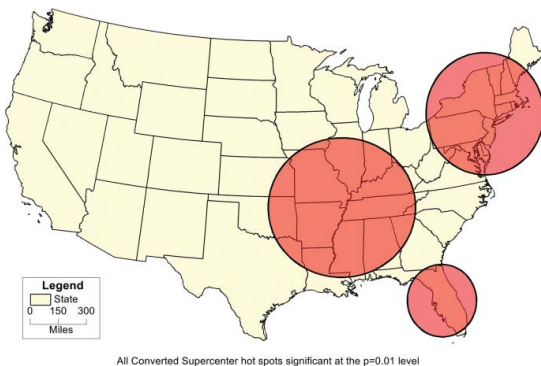


Figure 5 Converted Supercenter store hot spots, 2005. (Color figure available online.)

The study returns to further discuss these results in the conclusion.

Question 2: Store and Distribution Center Locations

This second question relates Wal-Mart's distribution centers to Wal-Mart's store opening decisions. This analysis focuses on all Wal-Mart stores opened during the 1990 to 2005 study period. A simple correlation analysis involving distribution centers and store locations nationwide indicates that distance to distribution center and store opening year are negatively and significantly related ($r = -0.371$, $p = 0.01$). This demonstrates that overall store-to-distribution-center distances actually decreased over time, indicating that store location in close proximity to a distribution center is not the primary characteristic of Wal-Mart's development strategy. Table 2 details this finding by segregating the correlation results by census region and store type.

In every region-store type combination represented in Table 2, a negative and significant relationship ($p = 0.01$) exists between distance to distribution center and year of store opening. This means that for each region and store type, stores tend to not be developed in a dense pattern around distribution centers. Rather, the evidence shows that Wal-Mart tends to locate its stores in the opposite manner, with stores removed from distribution centers opening first. These results provide a new perspective, because store locations far removed from distribution centers are linked with increased transportation costs, and cost minimization has been a Wal-Mart hallmark.

To further illustrate the negative relationship between store construction and distribution center distances, Figure 6 depicts average store-to-distribution center distances for all new discount stores and Supercenters opened in the Northeast region between 1991 (the year Wal-Mart first entered the Northeast) and 2005, and Table 3 provides a complementary perspective by summarizing the number of new Wal-Mart stores opened in each year. Figure 6 thus illustrates the overall decline in store-to-distribution-center distances characterizing Wal-Mart's expansion in the region. Distances were calculated for each store opened by taking the distance between each newly opened store and its closest distribution center at the

Table 2 Correlations of store opening year versus distance to distribution center by store type and major region

Store type	Northeast	Midwest	South	West
Discount	-0.611**	-0.414**	-0.234**	-0.503**
Supercenter	-0.793**	-0.482**	-0.483**	-0.549**
Converted to Supercenter	-0.546**	-0.424**	-0.426**	-0.448**

**Significant at the $p = 0.01$ level.

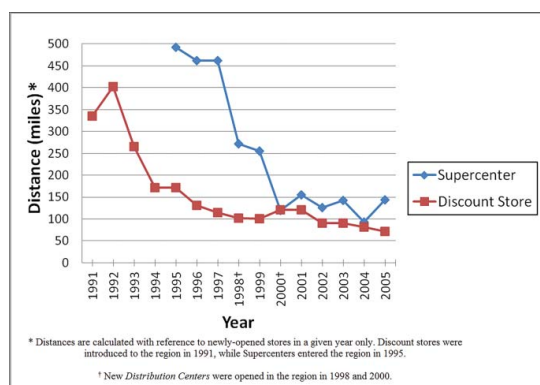


Figure 6 Average store-to-distribution-center distances for new Wal-Mart discount stores and Supercenters in the Northeast region, 1991–2005. (Color figure available online.)

time of the store's opening. The introduction of two additional distribution centers during the 1995 to 2005 period is one factor to consider in interpreting Table 3, but distribution center openings should not divert attention from the overall trend represented in Figure 6. Figure 6 demonstrates Wal-Mart's willingness to initially locate selected stores over an extended distribution territory and to wait to open other stores located in closer proximity to a distribution center. It should be noted that this is a new finding, not recognized in previous Wal-Mart store location research.

This behavior could be termed a *reaching effect*, where Wal-Mart could be hypothesized to have selected certain high-priority locations for stores, with the chain being willing to transport goods over long distances to these distant locations. The delayed development of stores closer to distribution centers further emphasizes this point (Wal-Mart should certainly not be viewed as intentionally incurring high initial transportation costs in the

absence of some compelling reason). The results indicate that Wal-Mart's development strategy does not focus on distribution center proximity and store density.

Question 3: Wal-Mart Store Locations and Market Demographics

The third research question follows up on the results of the second question by investigating whether there is evidence to suggest Wal-Mart's targeting of communities with specific demographic characteristics. As with the second question, this third question brings into the analysis all Wal-Mart stores opened and converted between the years 1990 and 2005. The question focuses on three key variables from the five-mile store zones discussed earlier: 1990 and 2000 average household incomes, population density, and unemployment rate. The study analyzes these variables in conjunction with store opening year to investigate the possibility of a temporal correlation (and thus an indication of Wal-Mart's development priorities).

Correlation analysis eliminates the unemployment variables (for 1990 and 2000) immediately, as these variables showed no significant correlations with store opening year. Table 4 displays correlation results for the remaining variables (household incomes and population density) relative to store opening year for all three store types. Positive correlations with store opening year (especially for original discount stores) indicate that Wal-Mart targeted lower income and lower population density markets first and then opened stores in higher income and more densely populated markets later. These outcomes suggest a partial basis for the reaching effect hypothesized earlier.

Table 4 Correlation results of Wal-Mart market incomes and population densities with store opening year

Region	1990 household income	2000 household income	1990 population density	2000 population density
Original Discount stores				
Northeast	0.428**	0.407**	0.362**	0.365**
Midwest	0.179*	0.158*	0.345**	0.339**
South	0.326**	0.292**	0.187*	0.157*
West	0.172*	0.131	0.348**	0.320**
Original Supercenter stores				
Northeast	0.166	0.169	0.105	0.113
Midwest	0.024	0.045	0.026	0.032
South	0.209**	0.237**	0.109	0.144
West	0.121	0.156	0.080	0.089
Converted to Supercenter stores				
Northeast	0.254	0.261	0.361*	0.356*
Midwest	0.135*	0.140*	0.057	0.059
South	0.019	0.019	0.112**	0.113**
West	0.287**	0.226*	0.223*	0.238**

*Significant at the $p = 0.05$ level.

**Significant at the $p = 0.01$ level.

Table 3 Number of new Wal-Mart stores opened in the Northeast region, 1991–2005

Year	New discount stores opened	New Supercenters opened
1991	9	—
1992	10	—
1993	30	—
1994	18	—
1995	26	8
1996	8	3
1997	15	6
1998	14	6
1999	6	14
2000	12	8
2001	18	9
2002	17	18
2003	13	8
2004	8	12
2005	6	13

Summary and Conclusion

Wal-Mart is a dominant force in contemporary U.S. retail. This status makes analysis of Wal-Mart's development strategy important and needed. This study focused on contributing to the retail location literature by analyzing the concurrent development of Wal-Mart's store and distribution center networks. To do this, the study focused on three key questions.

The first research question addressed was this: What is the geography of Wal-Mart stores by type? A series of hot spot analyses demonstrated the geographies associated with each of the three store types considered. Some interesting distinctions emerged from the analysis: Original discount stores have significant hot spots in major metropolitan areas on the Atlantic and Pacific coasts (including New York and Los Angeles); original Supercenters are clustered in the Mid-Atlantic and Midwest (including Pennsylvania, Virginia, North Carolina, Ohio, and Indiana), with a number of small hot spots in major Sunbelt metropolitan regions; and Supercenter store conversions are characterized by large hot spots in the South and Northeast (including Wal-Mart's Arkansas base).

The second research question focused on relating store development to distribution center development. Previous research has established Wal-Mart's cost-minimization strategy of locating stores in dense clusters (Graff 1998; Holmes 2011), so the expectation was for the analysis to uncover further evidence of high levels of store density with relation to Wal-Mart's distribution network. The study demonstrated, however, that close proximity to distribution centers is not a first priority in Wal-Mart's store expansion, as the analysis shows that store opening year and store-to-distribution-center distances are significantly and negatively correlated for all four census regions. This indicates that Wal-Mart actually tended to build its stores across its broad distribution center service regions first (a reaching effect) and then developed stores near its distribution centers later.

A third, exploratory research question investigated the existence of demographic triggers as they relate to Wal-Mart store development at the local level (Hicks 2008). This question focused on analysis of a small number of demographic variables in five-mile radius zones surrounding each Wal-Mart store. Although this analysis does not attempt to definitively identify Wal-Mart's detailed strategy, it does provide additional evidence to support previous suggestions of Wal-Mart's prioritization of lower income and lower population density markets for store entry, especially with its discount store format.

We conclude by addressing two key implications emerging from these results. First, the hot spot analysis should be seen as providing some insight into Wal-Mart's development as a business and the characteristics of the interaction of its overall store concept with the U.S. urban system. Two developments of importance occurred concurrently for Wal-Mart from 1990

to 2005: (1) the development of its store format from discount to original Supercenter and on to discount to Supercenter conversions (Graff 1998) and (2) the expansion of its geographic footprint (Graff and Ashton 1994; Holmes 2011).

The hot spot analysis provides some general indication of the complexity of the interaction between these two distinctive but related developments. Discount stores were Wal-Mart's original store format, but expansion caused the company to deal with further expansion based on this format in two distinctive ways. For discount stores spatially proximate to Wal-Mart's Arkansas base and in selected suburban markets in Florida and the Northeast, the analysis demonstrates that development of the Supercenter format led to large-scale upgrades of discount stores to Supercenters. For other markets in the Northeast, along the Pacific Coast, and in Florida, Wal-Mart continued with its discount format without Supercenter conversion. These findings lead us to hypothesize that Supercenter conversions did not take place in these markets because of limited land availability and high real estate costs, whereas lower real estate costs made Supercenter conversions economically viable in interior markets across the U.S. heartland.

Second, although previous studies emphasized the centrality of density considerations in Wal-Mart's location strategies, the store-to-distribution-center findings here should be seen as complementary and not contradictory with respect to this existing literature. Indeed, it remains indisputable that Wal-Mart has engaged in a process of national radial expansion that has been characterized by a dense store network throughout the firm's development (Graff 1998; Holmes 2011). This store development process has been accompanied by the construction of a linked network of distribution centers that follow this same, dense configuration and radial expansion (Holmes 2011). When viewed from the perspective of the store-distribution center relationship at the regional level (i.e., considering the zones serviced by each distribution center), however, the situation changes. The results here suggest that Wal-Mart has not prioritized store density as a primary location factor with respect to its distribution centers. Thus, although Wal-Mart has maintained a dense store pattern nationally, the results lead us to hypothesize that the firm has chosen to consider entry into communities that fit a specific profile within the geographic coverage envelope provided by its distribution centers. Thus, it could be conceptualized that local market entries have been guided by each distribution center's extended service area: Stores have been developed across these broad zones. Within these distribution center service areas, the study findings indicate that distribution center proximity (store-to-distribution-center distance) is only a secondary consideration relative to store development. Wal-Mart's store location process is thus more complex in scope than previously indicated, with our findings indicating that Wal-Mart has considered market

targeting a high priority alongside store density and cost minimization in its store development strategy.

In conclusion, this study has attempted to provide insight into the system-wide store location selection process employed by Wal-Mart through its concurrent store format development and national geographic expansion. This study is only one step in the extension of the retail literature, though. More needs to be done to better examine the linkages among firm and store development, location decisions, and market characteristics for Wal-Mart and other retailers. Incorporation of a wider range of market data relative to store location choice, more analysis of distribution networks, research into store closings as well as openings, and investigation of store format evolution for more retailers are only a few examples of the research needed to provide better insight into retail location strategy. Businesses, governments, and communities can all benefit as the principles leading to better development strategy become more widely known within the evolving retail environment. ■

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Notes

¹For purposes of this analysis, store-to-distribution-center distances were calculated according to store type. Distances for discount stores were calculated relative to standard distribution centers, whereas distances for Supercenters (original and converted) were calculated relative to grocery distribution centers.

²Indeed, store closures were not even mentioned in connection with Wal-Mart by Graff (2006) or Holmes (2011), even though Graff (2006) specifically addressed store closures elsewhere in his analysis with respect to Kmart's network evolution.

³It should be noted that some stores in large urban areas are relatively close to each other. For the purposes of this analysis, store area overlap has been eliminated in cases where the five-mile zones intersect using the Thiessen polygon approach (K. Jones and Simmons 1993).

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- MURRAY D. RICE is an Associate Professor in the Department of Geography at the University of North Texas, Denton, TX 76203. E-mail: rice@unt.edu. His research interests include the spatial analysis of business activity and regional urban and economic development.
- ANTHONY OSTRANDER is a former graduate student in retail geography in the Department of Geography at the University of North Texas, Denton, TX 76203. E-mail: anthonyostrander@gmail.com. His research interests include the geographic expansion and dispersion patterns of retailers in the United States.
- CHETAN TIWARI is an Associate Professor in the Department of Geography at the University of North Texas, Denton, TX 76203. E-mail: chetan.tiwari@unt.edu. His research interests include health and medical geography, location modeling, computational geography, and geographic information science.