Business District Development and Competition: An Exploration of Structural Evolution in the Retail Districts of Denton, Texas

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ABSTRACT A substantial literature has established the competitive impacts of retail chain development on single location retail businesses. This study explores the characteristics of these impacts at the local level through analysis of the structure of five distinctive retail districts in Denton, Texas. The analysis focuses on Denton's central business district (CBD), a traditional retail strip, a special retail district, an enclosed shopping mall, and a power retail center. The empirical foundation for the investigation is a business database covering the years 1997 to 2010. This database captures location, industry, and firm status (single versus chain location) for each business operating in the city. Through the study period, the single versus chain location relationship did not substantially change within any of the districts. However, all five retail districts experienced decreasing retail diversity, indicating a greater focus on specific business types. Denton's power retail center focused on chain restaurants and big box stores, while the CBD shifted from low-end retail to local food and drinking establishments. Both of these leading districts appear to have developed unique competitive advantages. In the CBD's case this is especially instructive given the many other cities where chains have outcompeted local retailers and associated business clusters.

Key words: retail, development, business structure, diversity.

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1. INTRODUCTION

One crucial area of ongoing advancement in the regional development literature is analysis of the roles played by small and large businesses in building local economies. While there is evidence of overall sales and employment growth in the U.S. small business sector (US Chamber of Commerce Foundation, 2016), it is also true that small, single location retail businesses have been losing market share to large retail chains for several decades (Jarmin et al., 2009). The retail industry indeed shifted to emphasize large chains from 1952-1992 (Boyd, 1997), a process that continued through the 2000s (Miller et. al, 1999; Han, 2000; Joseph, 2009; Kem, 2017). One point of contrast: the number of large retail firms more than doubled from 1963-2000, while single location retailers declined 2009). Further, same period (Jarmin et. al., during the as of 2014.PricewaterhouseCoopers found that 95% of all retail businesses operate a single location (National Retail Federation, 2014). What makes this interesting is the remaining 5% of all retail businesses (chains) account for more than 60% of consumer spending (Basker et al., 2012). Overall, large retail chains appear to be outcompeting small, single location retailers.

Despite these overwhelming numbers, there is a case to be made that small, single location retail businesses provide substantial local benefits. Small retailers typically locate in "humanly-scaled, pedestrian friendly shopping districts, as opposed to the sprawling, isolated experience of a chain store parking lot" (Mitchell, 2000). In contrast with large retail chains, a vibrant local retail fabric is a primary generator of a sense of place. Kip Bergstrom, an economic developer from Connecticut, addressed this idea by suggesting, "Retail is the thing that makes a place interesting. Without retail you don't have a place," (Robare, 2016). With the preceding in mind, the question is no longer, *if* small, single location retail businesses matter (they clearly do), or if they are impacted by large retail chains (they absolutely are), but instead *how* these effects are occurring over space and time. Thus, the goal of this investigation is to explore the relationship between small, single location retail businesses and large, multi-locational retail chains in terms of concurrent changes in location and business type diversity. The study investigates this general issue in the local context provided by five unique retail districts in Denton, Texas in the late 1990s and early 2000s, focused on three distinctive areas of inquiry:

- 1. How did the overall structure of Denton's retail districts change through the study period?
- 2. In each retail district in Denton, was there a shift toward more specialization (lower diversity) or greater variety (higher diversity) among the district's retail and service businesses?
- 3. In each retail district in Denton, to what degree did a single retail subclass dominate the local business community, and which retail subclass was the largest in each retail district?

2. RELEVANT LITERATURE

The following surveys the background for this investigation from the broad field of retail geography, and provides focused context from the targeted study of retail activity in a variety of business district contexts.

2.1 RETAIL GEOGRAPHY

Retail geographers began integrating spatial analytics into retail studies in the mid-20th century. Early investigation in the field focused on consumer behavior (Green, 1936; Applebaum, 1951) and large-scale retail trade (Converse & Mitchell, 1937; Doherty, 1941). By the end of the 1970s, the quantitative revolution brought retail location to the forefront (Wilson, 1967; Forbes, 1972). For instance, Applebaum (1966) and Ghosh & Craig (1983) developed location models aiding retailers to plan for changes in varying retail environments. However, retail environments have changed markedly over the past fifty years, beginning with central business districts (CBDs), retail strip centers, and traditional shopping malls (Goss, 1993; Bloch et al., 1994), and culminating with contemporary power retail formats (Murray & Hernandez, 2016). Prior to the 1990s, due to its focus on basic store location and mapping, retail geography was considered an inferior sub-discipline within geography (Crewe, 2000; Lowe & Wrigley, 2000). However, by the 1990s a research stream emerged that stressed the importance of retail activity in the consumption and location of spaces and places, garnering attention that resulted in retail geography gaining broader acceptance (Crewe, 2000). While consumption remains crucial, an overarching issue emerging in today's hyper-competitive economy is the development of different types of business districts, and what if any impact the emergence of new retail districts is having on pre-existing counterparts.

Although the literature investigating the impacts of new retail developments on existing retailers is not extensive, three studies stand out:

- 1. Schapker (1956) examined how the opening of a new, planned shopping complex including several large retail chains affected the range of store categories operating in an established retail center in the same market area. He found that certain types of retailers, such as clothing and jewelry retailers that were part of the older retail center were adversely affected more than others in terms of generating sales revenue. Schapker did not account for the impacts of large retail chains on local retail.
- 2. Pratt and Pratt (1960) studied the impacts of suburban shopping center development on a central city. They found that new suburban retail developments caused a "reshuffling" of market shoppers. This realignment refers to retail shoppers changing their shopping patterns in response to the establishment of the two regional suburban shopping centers. This reshuffling resulted in central city retailers seeing a decrease in sales and shoppers. This study concentrated on consumer behavior patterns induced by new suburban retail development.

3. Most recently, Dickinson and Rice (2010) studied local business shifts in Port Huron, Michigan, after the city's only mall opened in 1980. They found that the mall had an impact on location shifts between the city's CBD and the shopping mall district on the city's northern edge. The opening of the shopping mall development did not directly affect the overall retail business density evident from the pre-mall era, but it did impact the location patterns associated with specific business types, such as eating establishments. While this study addresses important questions about retail district development, its mall and CBD focus leaves unaddressed the question of impacts of newer retail format development, including power centers and lifestyle centers.

Beyond the retail development impact theme, a separate research stream has addressed the retail format evolution that has brought power retail formats to dominate new retail developments. As with much of the preceding, the power retail literature focuses on changes in the evolution of the format (Hernandez & Simmons, 2006), customer behavior and purchasing patterns (Bodkin & Lord, 1997), and large format retailer competition (Graff, 2006). Only recently has attention been directed to the relationship between single location retailers and chain stores. However, even here the focus has been on employment issues (Haltiwanger et. al., 2010) and small business perceptions of chains (Cotton & Cachon, 2007), leaving the "single versus chain location" dynamic unexplored in a geographic context.

Many studies at the national level deal with chain competition (Graff, 2006; Joseph, 2009), location strategies (Ceh & Hernandez, 2010; Rice et al. 2016), consumer behavior (Singh et al., 2006), and chain growth (Jarmin et. al., 2009; Basker et. al., 2012). However, even these diverse studies leave the effects of chain stores on single location retailers under-investigated. Three geographic studies address issues close to the single versus chain location debate, but ultimately focus on related issues. Hernandez et al. (2004) analyze power retail and its impacts on surrounding retail developments in two large metropolitan regions, but only considers retail chains. Buliung & Hernandez (2009) study power retail growth strategies related to consumer travel patterns, but do not examine interactions with single location retailers or other non-power center business districts. Finally, Dickinson & Rice (2010) investigate CBD retail change occurring concurrently with new mall development, but do not break out single-location and chain firms.

To complement the above, it is also important to understand the various retail district types present in North American cities. Buliung & Hernandez (2013) introduce retail district evolution, stating that "traditionally, chain stores have tended to dominate the planned shopping centers while the independents have normally been restricted to unplanned central city or retail strip locations." However, more detail yet is necessary. To

build on this, the following addresses key issues associated with North American retail district types as of the early 2000s.

2.2 CENTRAL BUSINESS DISTRICTS

CBDs have been centers of urban activity since ancient times. Ancient CBDs were central markets where locals would trade. Modern day CBDs are the complex product of rapid urban growth and waves of economic and technological change (Murphy, 2007; Gibbs, 2012). As of the early 1900s, cities were characterized by low overall mobility and a pedestrian oriented environment in which most retail, financial, and restaurant activity located in the CBD (Harris & Ullman, 1945). Today, cities are characterized by a high-density core that encompasses retail, office, and entertainment space that exists in competition with suburban alternatives linked via sprawling road and transit networks (Gibbs, 2012).

2.3 RETAIL STRIP CENTERS

Beginning in the 1920s, American cities saw rapid suburbanization (Burayidi, 2001). "[D]uring the post-World War II era, populations shifted to the suburbs, automotive transportation became widely available, and the first suburban shopping centers were developed...Thus, there was a strong economic incentive for retailers offering diverse goods to abandon their downtown locations..." (Padilla & Eastlick, 2009). As suburbanization continued through the 1970's, downtowns stagnated as residents moved out and relocated their shopping from traditional CBDs to business strips in the urban outskirts (Gibbs, 2012).

2.4 SHOPPING MALLS

Through the last half of the 20th century, enclosed shopping malls became the new "Main Streets" of America (Matchar, 2017). Suburban shopping malls are characterized by their structure consisting of large anchor department stores connected by a climate-controlled walkway, with parking around the perimeter (ICSC, 2017). Malls were designed as a community center where people could shop and socialize (Gruen & Smith, 1967; Gibbs, 2012). Presciently, Sternlieb and Hughes (1981) suggested that by the early 1980s shopping malls reached peak market share and sales, giving way to newer retail formats.

2.5 POWER RETAIL CENTERS

The International Council of Shopping Centers (ICSC) defines power retail centers as large, open air centers between 250,000-600,000 square feet having three or more category killer stores (ICSC, 2017). Hahn (2000) provides a related definition of power retail centers as being an "agglomeration of big-box stores." "Big box" retailers are large, warehouse-like structures that often offer value-oriented pricing, including dominant, national giants such as Target, Wal-Mart, and Kohl's (Hahn, 2000). "Category killers" are specialized big box stores that offer products in a single retail category (Hahn, 2000), such as Lowes, Home Depot, and Best Buy. In a study comparing U.S. and Canadian retail, Hernandez and Simmons (2006) further classify power retail centers into two categories.

- 1. *Power strips* are "three or more free standing big boxes located contiguously along arterial routes within 800 meters of each other, not all sharing the same parking facilities or part of the same development and may include other ancillary smaller commercial services" (Hernandez and Simmons, 2006).
- 2. *Power clusters* are "three or more free standing big boxes large warehouse like structures offering value-oriented pricing (Hahn, 2000) located typically around a major intersection, not all sharing the same parking facilities, and may include other ancillary smaller commercial services" (Hernandez and Simmons, 2006).

In sum, since the late 1990s, shopping malls have declined while power retail centers have expanded (Sanburn, 2017). Power retail formats are anchored by large retail chains which have led recent retail growth in terms of overall sales generation (Foster et al., 2015), product offerings (Holmes, 2011), and new distribution technology implementation (Holmes, 2001). However, these changes are accompanied by another development: a reemergence of CBDs and their single-location retailer communities (Robertson, 1997 & 2004). Given this conjunction of trends, it is interesting to note that there has been little examination of the concurrent development of different retail district types and their distinctive businesses. Specifically, there is a need to identify how chain versus single-location and downtown versus power center dynamics have played out, not just in national figures, but in tangible terms at the local level. The following focuses on how the present study addresses this goal.

3. RESEARCH DESIGN

3.1 CASE STUDY VENUE AND PERIOD

The City of Denton is located at the northern end of the dynamic Dallas-Fort Worth metropolitan area (Figure 1). The city was incorporated in 1866, with a local economy based primarily on agriculture. Population growth was spurred on by the establishment of the Texas Normal College (now known as the University of North Texas) in 1890 and Texas Woman's University in 1901 (Odom, 2010). Denton has experienced much population expansion since 1900, with most growth occurring in the early 2000s when the city's population grew by 73% (US Census, 2015). As of 2018, Denton had over 130,000 residents (US Census, 2018) and an economy based on services and manufacturing (City of Denton Economic Development Department, 2018). It is the regional service center function of Denton that forms the focus here.

Within Denton, this research examines change in the city's five dominant retail districts as of 2010: Denton's Central Business District (CBD), the Fry Street District,

Golden Triangle Mall, University Drive, and Denton Crossing (Figure 2). Using year-built GIS land parcel data acquired from the City of Denton Open GIS data portal, it is possible to identify the primary eras of development associated with each of these districts:

- *CBD:* from the late 1800s to the 1930s
- *University Drive:* between the 1950s and 1970s
- *Golden Triangle Mall:* from the 1980s to 1990s, and
- *Denton Crossing:* the early 2000s.

The fifth and smallest business district, the *Fry Street* area adjacent to the University of North Texas, represents a more complex situation, in that many businesses currently serving the district were developed between 1990 and 2010 (similar to Denton Crossing), but predecessor businesses located along Fry Street began to serve the nearby University of North Texas campus beginning in the 1960s and 1970s.



Figure 1: Denton's Location at the North End of the Dallas-Fort Worth Metroplex

The present investigation examines the period from 1997 to 2010. These years coincide with a period of major change in Denton's retail history, keyed by the development of the Denton Crossing power retail complex between 1996 and 2008. It is

important to note the 1980 opening of Golden Triangle Mall (adjacent to Denton Crossing) in this context. However, in terms of current economic change, mall-based development is no longer a source of innovation or growth in America. Also, focusing on the local level, Denton's retail community had arguably adjusted to the mall's presence by the early 1990s, making the 1996 initiation of Denton Crossing's development the true driver of retail change in the city from the late 1990s through the 2000s. Thus, the development of Denton Crossing marks a distinctive transition in Denton's development, providing a strategic opportunity for research to track the local retail and service business community's response to a major local retail change.¹

Denton Crossing's launch was marked by the establishment of Lowes (Denton County Appraisal District, 2017) and Wal-Mart (Holmes, 2011) as the district's first two large retail chains in 1996. The year 1997 was the first year of data availability from the data source used (see the following section for data source discussion). Given Denton Crossing's development initiation in 1996, 1997 is a suitable date to mark the beginning of the power center's impacts. Substantial completion of Denton Crossing occurred in 2008 with the addition of Target and Home Depot. This means that the year 2010 represents a strategic point that falls after Denton Crossing's 2008 completion that also coincides with the beginning of large-scale development at Denton's newest retail complex, Rayzor Ranch (Dallas News, 2013). Analysis of Denton's retail businesses and locations through the 1997 to 2010 period thus allows the study to capture the adjustment of retail districts across the city happening concurrently with the progressive development of Denton Crossing, while avoiding the complication of accounting for the newer, incomplete, and still-evolving development at Rayzor Ranch.

3.2 DATA

This investigation uses Infogroup's Reference USA historical business dataset. This rich and reliable database consists of all business records in the Reference USA historical

¹ One additional retail development, the Rayzor Ranch complex, was announced for development on West University Drive in 2006. However, the 2008 recession delayed construction and the first store openings until 2010 (Dallas News, 2013). As of late 2019, Rayzor Ranch continues to evolve as new retail and entertainment anchors are recruited and the plan for the complex remains subject to major modification (Heinkel-Wolfe, 2019). Because of these plan changes and the ongoing nature of the Rayzor Ranch project, the ultimate impact of the project on the Denton retail environment is yet to be fully realized. It is clear that continuation of the present study past 2010 would bring in retail development effects related to Rayzor Ranch's incomplete emergence. Thus, for these reasons, the present study ends with 2010 and does not attempt to include Rayzor Ranch as a sixth retail district or address any retail developments in Denton after 2010 that would require incorporation of Rayzor Ranch in the analysis.

database from 1997 to 2010 located in the Denton zip codes that cover the five retail districts studied here. The study extracted from this database all retail business and food and beverage establishments, defined as the North American Industry Classification System (NAICS) 2-digit-level 44-45 "Retail Trade" and 72 "Accommodation and Food Services" categories, excluding all others. To provide an indication of the spectrum of business classes included in the study, Table 1 lists the detailed NAICS 4-digit business categories included within the NAICS 44-45 and 72 classes that from the research focus. The study completed all business structure analysis at this 4-digit level.



Figure 2: Map of the City of Denton Identifying the Study's Five Retail Districts

To verify and enhance the database quality, the study used a comprehensive location verification process to check and correct the Reference USA latitude and longitude data for each business against parcel data for each business. Extensive processing was also completed to detect and remove duplicate business entries and ensure the overall integrity of the final study database. The study applied this complete process of NAICS filtering, location verification, and duplicate processing to the original, raw database of 12,653 business records, which resulted in a final roster of 5,307 distinctive and authenticated business records for further analysis as defined by the study's research questions.

Table 1: The 33 NAICS 2012 4-Digit Business Classes Analyzed in this Study

NAICS Code	Business Class Description
4411	Automobile Dealers
4412	Other Motor Vehicle Dealers
4413	Automotive Parts, Accessories, and Tire Stores
4421	Furniture Stores
4422	Home Furnishings Stores
4431	Electronics and Appliance Stores
4441	Building Material and Supplies Dealers
4442	Lawn and Garden Equipment and Supplies Stores
4451	Grocery Stores
4452	Specialty Food Stores
4453	Beer, Wine, and Liquor Stores
4461	Health and Personal Care Stores
4471	Gasoline Stations
4481	Clothing Stores
4482	Shoe Stores
4483	Jewelry, Luggage, and Leather Goods Stores
4511	Sporting Goods, Hobby, and Musical Instrument Stores
4512	Book Stores and News Dealers
4521	Department Stores
4529	Other General Merchandise Stores
4531	Florists
4532	Office Supplies, Stationery, and Gift Stores
4533	Used Merchandise Stores
4539	Other Miscellaneous Store Retailers
4541	Electronic Shopping and Mail-Order Houses
4542	Vending Machine Operators
4543	Direct Selling Establishments
7211	Traveler Accommodation
7212	RV (Recreational Vehicle) Parks and Recreational Camps
7213	Rooming and Boarding Houses
7223	Special Food Services
7224	Drinking Places (Alcoholic Beverages)
7225	Restaurants and Other Eating Places

3.3 RESEARCH QUESTIONS

Question 1: Structural Change. How did the structure of each of the five retail districts change over the 1997-2010 period in terms of types and numbers of retail businesses and employment totals?

This broad question investigates basic elements of structural change by district, aiming to define the evolving composition of the business community in each of Denton's five retail districts with consideration of the range of retail and service business types present in the city (e.g. grocery, clothing, shoes, etc.). One foundational chain versus single location business expectation is that the developing Denton Crossing power center and Golden Triangle Mall complexes would grow in attraction for chain businesses through the study period, while the CBD and the other, older retail districts would become increasingly attractive to single location retailers. This follows from Dickinson and Rice's (2010) study of mall development and CBD impacts in Port Huron, where larger chain apparel and automotive retailers relocated to the shopping mall area after its development, while another business subset including local food and beverage venues shifted toward the CBD. Related to this, the study's employment expectation is that the geography of retail jobs follows the overall business location expectations defined above. Employment increases in the Denton Crossing power center and Golden Triangle Mall complexes are thus expected to be driven by chain business growth, while the study expectation for the CBD and the city's other, pre-1980 retail districts is that job change in these older business zones has focused on employment expansion from single-location businesses. These expectations parallel the Toronto-based retail employment findings of Hernandez, Helik, & Moore (2007), who found that chains accounted for most employment in the emerging retail districts they examined.

Question 2: Retail Diversity. How did retail diversity change within Denton's five retail districts from 1997 to 2010?

The goal of this second level of analysis is to determine how each of Denton's retail districts changed in retail diversity as Denton Crossing developed, and to identify which of Denton's retail districts saw the greatest amount of change over that period. Drawing from research in ecology, diversity as used here refers to a situation where a single variable (such as a wildlife population) can be divided into two or more distinctive subclasses (Kim et al. 2017; Matos et al. 2017). In the present study, diversity relates to the sectoral structure present within a business community. In this sense, diversity might be conceptualized at a basic level as the number of economic subsectors that are part of a given business community. However, to limit the definition of diversity to a simple count of business categories represented neglects a foundational issue that also links to diversity: the abundance of businesses in each category (Magurran, 2004). Thus, to fully consider diversity, diversity needs to be conceptualized as the conjunction of two related

concepts: *richness* (a reflection of the total number of business categories present in a given district), and *evenness* (a measure of relative similarity in business counts present across all business categories in the district). By drawing on both richness and evenness we can develop a comprehensive business structure profile (Magurran 2004).

The research here thus focuses on analysis based on business counts by retail subsector within the overall retail business total for each district. This second area of analysis seeks to determine the degree to which there has been a shift toward more specialization (lower diversity) or greater variety (higher diversity) in each of Denton's five retail districts through the study period. Drawing upon studies by Dickinson and Rice (2010) and Yarbrough and Rice (2013), the study expectation is that the analysis will demonstrate increasing specialization across the study districts, as each district develops a distinctive identity to gain an improved competitive position within the city. Such a shift to lower diversity through the 1997-2010 study period is a logical outcome of the introduction of the hyper-competitive Denton Crossing power center in the local market in 1996.

Question 3: Retail Evenness. How did retail evenness within the five retail districts change from 1997 to 2010?

The goal of this third analysis is to investigate the extent to which retail districts saw change in evenness concurrent with the introduction of chain stores in Denton Crossing. Drawing again on ecological research methods, this evenness question focuses on the overall similarity of business subclass counts within each district (Smith and Wilson 1996; Zhang et al. 2012). High evenness would follow from a situation where all subclass counts are close to the same (such as 5 subclasses with 20 counts in each), while low evenness would result from a small number of subcategories accounting for most counts in the variable (such as one subclass with 80 counts and four additional subclasses with 5 counts in each). This investigation centers on quantifying the change in retail structure by retail district in Denton, as reflected by the evenness measure.

The study expectation is that retail business evenness declined in Denton, meaning that only a few types of retail subclasses account for most of the retail businesses present. This expectation is supported by recent studies substantiating the recent shift in the retail landscape, driven primarily by big box and chain store introduction in local communities across the United States (Armstrong, 2012; Litz & Pollack, 2015; Vandegrift & Loyer, 2015; Goodman & Remaud, 2015). A key related element to be investigated here is the business type context that accompanies the district evenness analysis: more specifically, which specific retail or service subclass is most numerous in each district. The expectation here is that there is a notable variation in leading business category present in each district, as competitive pressures can be hypothesized to lead each district to develop a distinctive business profile to differentiate itself from its local district competitors (see,

for example, Hayter's (2010) treatment of differentiation and competition at the regional level).

4. RESULTS

4.1 QUESTION 1: RETAIL STRUCTURAL CHANGE

This first area of investigation focuses on identifying and understanding change in the business structure present in Denton's five retail districts, considering the types and numbers of retail businesses and their employment totals. To begin this inquiry at a broad level, the study computed retail business counts by retail district using Reference USA business status codes that allowed the analysis to identify locations associated with chain versus single-location retail firms. The study also computed aggregated retail employment totals for each of the five districts and their chain and single location business components.

Table 2 shows retail business counts for single and chain locations, respectively, by year and retail district. Growth in both single and chain location retail businesses in Denton Crossing is highlighted by the percentage change column of the two tables, focused on business totals in the 1997 and 2010 study end point years. For *single location businesses*, the only retail district that experienced decline from 1997-2010 is the Fry Street District (-21%). Single location business growth in the other districts varied from 0% (CBD) to +800% (Denton Crossing). For *chain locations*, Denton Crossing's emergence is highlighted by its 1,867% change in chain retail businesses from 1997-2010. Golden Triangle Mall was the only other retail district with chain business growth (+12%). Both University Drive and the CBD experienced a decline in chain businesses (-27% and -11%, respectively). Fry Street had no change in chains from 1997-2010.

				SIII	gie Loc	ation I	ketali i	busines	ss cour	us					
	199 7	199 8	199 9	200 0	200 1	200 2	200 3	200 4	200 5	200 6	200 7	200 8	200 9	201 0	% Change (1997- 2010)
Fry Street	19	17	17	17	15	17	23	21	21	22	19	17	17	15	-21%
University Drive	60	58	57	56	62	66	60	61	63	68	63	65	59	66	10%
CBD	101	90	85	86	99	103	102	90	109	94	92	103	102	101	0%
Denton Crossing	2	1	1	2	3	4	3	9	10	9	10	14	18	18	800%
Golden Triangle Mall	32	40	41	41	45	42	48	45	50	37	47	32	48	45	41%

Chain Location Retail Business Counts

Table 2: Single and Chain Location Retail Business Counts by District and Year

	199 7	199 8	199 9	200 0	200 1	200 2	200 3	200 4	200 5	200 6	200 7	200 8	200 9	201 0	% Change (1997- 2010)
Fry Street	4	4	5	4	4	5	4	5	6	6	6	5	5	4	0%
University Drive	48	40	38	36	34	36	35	38	34	338	37	39	41	35	-27%
CBD	9	6	7	5	6	5	9	7	7	9	11	10	10	8	-11%
Denton Crossing	3	3	4	3	6	8	11	32	38	47	52	53	58	59	1867%
Golden Triangle Mall	66	71	81	80	76	86	74	69	69	72	69	82	79	74	12%

Single Location Retail Business Counts

Although tracking absolute business numbers by district (as above) provides some basic perspective on 1997 to 2010 retail development, these figures alone do not give a complete indication of what, if any, structural shifts occurred in each retail district. Therefore, the study also calculates single to chain location business ratios using the expression:

$$R = \frac{S}{S+C} \tag{1}$$

Here, *R* is the single to chain location business ratio, *S* is the number of single location retail businesses in a given retail district and year, and *C* is the number of chain retail businesses in the same retail district and year.

Figure 3 summarizes the relative positioning of the five districts in terms of (1) single to chain location structure, and (2) how these relationships changed from 1997 to 2010. This graph emphasizes these overall tendencies with trend lines generated by simple linear regression. Each trend line is represented in the standard form y = mx + b, where *x* is the time (horizontal) axis, *y* is the R ratio (vertical) axis, *m* is the slope of the regression line, and *b* is the R ratio axis intercept.

The *m* (slope) values, characterizing the overall direction of the structural trend in each district, indicate direction of change. Positive slopes indicate a shift towards single location businesses, while a negative slope indicates a shift towards a chain orientation. These slope results indicate little change for any of the five districts, with the largest slope indicator coming from Denton Crossing. This power center's pronounced, negative slope (m = -0.0113) indicates a district that increased in chain dominance, a finding that makes sense given the study period's coverage of the initial year of development for the chain-oriented district.

The *b* (intercept) component of the regression results reveal a clear ordering of the five districts, from most single location oriented to most chain oriented. The districts in order by *b*-value are: CBD (b = 0.9394, single location orientation), Fry Street (0.8137, single location orientation), University Drive (0.5849, mixed orientation), Golden Triangle Mall (0.5424, mixed orientation), and Denton Crossing (0.3389, chain orientation). Overall, Figure 3 depicts a range of structural orientations among Denton's business districts, accompanied by much stability in terms of single versus chain location business mix.



R=o indicates chain dominance in a district, while R=1 indicates single-location firm dominance. A positive slope indicates a trend toward a single-location firm orientation in a business district, while a negative slope indicates a trend toward a chain orientation.

FIGURE 3: R RATIO (SINGLE LOCATION TO CHAIN LOCATION) CHANGES BY RETAIL DISTRICT IN DENTON, 1997 TO 2010

Additionally, the analysis broke out employment totals for each district and business status code from 1997-2010 to further identify and understand change in retail structure from yet another perspective. Employment totals were aggregated and summed by retail district for each study year. Table 3 shows single and chain location employment totals by year and retail district. Most notably:

• *The CBD* showed large, divergent trends in employment totals, with a change of +55% in single location and -53% in chain location employment from 1997-2010. This, along with the above mentioned single and chain location ratio changes in the CBD, indicates that the CBD's business behavior was consistent with study expectations of having an increasing proportion of single location retail and employment from 1997 to 2010.

- *Denton Crossing*'s (+1,224%) massive percent increase in chain location employment coincides with study expectations, but the district's large single location employment increase (+2,200%) does not. This exceptional expansion performance in both employer types can be attributed to the district's new and emerging status, although it should be noted that chains are much more important than single location businesses as an employment driver: there were 2,277 chain jobs versus 161 single location business jobs in the power center in 2010.
- *Golden Triangle Mall* (+29%) saw an increase in chain location employment totals, but a decrease (-14%) in single location employment. Both changes were consistent with study expectations.
- *The Fry Street district* decreased in single location employment (-8%) but increased in chain employment (+26%). This is the polar opposite of the study expectation.
- University Drive was the only retail district to experience a decrease in employment in both single location businesses (-16%) and chain locations (-12%) from 1997-2010. This is interesting because it indicates that, at least in terms of employment, University Drive has experienced more negative impacts from the development of Denton Crossing than Denton's CBD.

The extensive district-level detail in the results set for the first research question lends itself well to further discussion, but first the study turns to explanation of the results for the other two areas of inquiry.

4.2 QUESTION 2: RETAIL DIVERSITY

This second area of investigation focuses on identifying change in business diversity within Denton's five retail districts. To address this issue, the study uses Simpson's Diversity Index (SDI) to measure retail diversity in each retail district (Smith and Wilson, 1996; Magurran, 2004). SDI is of great utility because it combines consideration of both the richness and evenness dimensions of diversity in a single index (David, 2017). SDI can be represented as:

$$D = \frac{\sum n(n-1)}{N(N-1)}$$
(2)

In this expression, D = Simpson's Diversity Index, n = the number of businesses in a given business class, and N = the total number of business classes considered. D-values range between 0 and 1, with 0 representing the highest possible diversity, and 1 representing no diversity.

Table 3: Single and Chain Location Retail Employment Counts by District and Year

Year	Fry Street	University Drive	CBD	Denton Crossing	Golden Triangle Mall
1997	174	476	466	7	272
1998	159	396	394	0	306
1999	137	261	416	0	341
2000	137	275	372	4	344
2001	141	310	721	40	337
2002	141	286	746	21	282
2003	190	385	550	16	363
2004	177	343	483	49	290
2005	180	324	617	67	342
2006	195	323	584	55	251
2007	187	234	633	75	184
2008	195	400	712	81	216
2009	188	353	739	172	200
2010	160	402	721	161	234
% Change (1997- 2010)	-8%	-16%	+55%	+2,200%	-14%

Single Location Employment Totals

Chain Location Employment Totals

Year	Fry Street	University Drive	CBD	Denton Crossing	Golden Triangle Mall
1997	43	886	158	172	1,421
1998	38	816	130	<u>2</u> 54	1,660
1999	72	776	132	286	1,892
2000	61	759	117	264	1,765
2001	57	717	41	305	1,580
2002	69	743	35	345	2,010
2003	51	752	65	381	1,503
2004	65	781	72	912	1,458
2005	76	705	121	873	1,621
2006	86	817	128	1,010	1,603
2007	95	809	141	1,948	1,646
2008	80	807	136	2,255	2,405
2009	69	829	110	2,240	2,100
2010	54	781	75	2,277	1,831
% Change (1997- 2010)	+26%	-12%	-53%	+1,224%	+29%

Table 4 displays the *D*-values calculated for each year and retail district in this study. All five retail districts are closer to 0 (complete diversity) than to 1 (no diversity), but all experienced a decrease in diversity through the study period, with *D*-values moving closer to 1. In terms of findings for specific business districts,

- All of Denton's retail districts shifted toward less diversity from 1997 to 2010.
- The most diverse retail district across all study years was the CBD (D = 0.06 in 1997, and D = 0.07 in 2010), compared with Denton's least diverse retail district, Fry Street (D = 0.17 in 1997, and D = 0.30 in 2010).

Table 4: Simpson's Diversity Index by Year and Retail District

	Frinary NAICS 4 Digit											
Year	CBD	Fry Street	Denton Crossing	University Drive	Golden Triangle Mall							
1997	0.06	0.17	0.00	0.12	0.09							
1998	0.06	0.19	0.00	0.14	0.09							
1999	0.07	0.14	0.00	0.14	0.10							
2000	0.07	0.12	0.00	0.16	0.10							
2001	0.06	0.15	0.00	0.11	0.10							
2002	0.07	0.18	0.00	0.11	0.10							
2003	0.07	0.19	0.00	0.13	0.12							
2004	0.06	0.20	0.09	0.15	0.11							
2005	0.06	0.20	0.12	0.15	0.11							
2006	0.06	0.26	0.09	0.15	0.11							
2007	0.06	0.29	0.10	0.15	0.13							
2008	0.06	0.21	0.11	0.15	0.11							
2009	0.07	0.21	0.13	0.17	0.11							
2010	0.07	0.30	0.14	0.16	0.11							

Simpson's Diversity Index (D) Primary NAICS 4 Digit

D=0 indicates complete diversity, while D=1 indicates no diversity

While the CBD has evolved into a high-level food and entertainment center for the region, its diversity relative to the other districts is a good reflection of its continuing function as a central service hub for the city. At the other end of the diversity spectrum, Fry Street's location next to the University of North Texas makes it a vibrant cluster of food and drinking establishments providing a specialize service to a rich, localized market. While these straightforward results aid in providing detail on Denton's overall retail landscape, before turning to overall discussion the study turns to survey the results for the final research area.

4.3 QUESTION 3: RETAIL EVENNESS

The study's third area of investigation focuses on change in retail business evenness, or the relative distribution of business counts by category, within Denton's five retail districts. This specific distribution focus provides an opportunity to identify and examine in more detail the presence of specific business categories that have gained a particularly influential position within a district. For this purpose, the study uses Simpson's Measure of Evenness index (Smith and Wilson, 1996; Magurran, 2004):

$$E_D = \frac{D}{D_{Max}} \tag{3}$$

Here, E_D is Simpson's Measure of Evenness for a given retail district, D is Simpson's Diversity Index for the retail district, and D_{Max} is total number of NAICS categories in the retail district during the given year. E_D takes on values between 0 and 1, with 0 indicating complete unevenness.

The evenness findings in Table 5 suggest that important changes occurred over the study period. All five retail districts experienced a decrease in retail evenness, meaning that a small number of NAICS 4-digit categories became more prominent in each retail

district. Against study expectations, in all five districts and across all years, "Restaurants and Other Eating Places" (NAICS 4-digit code 7225) was the leading category, with two exceptions (see Table 6).

- In 1997 the CBD was dominated by used merchandise sales (NAICS 4533) and electronic and appliance stores (NAICS 4431), however by 2010 the CBD was dominated by restaurants and eating places (NAICS 7225). The 1997 numbers could be interpreted as an indication of an under-performing business cluster that went on to see a complete transformation by 2010.
- Also in 1997, Denton Crossing had fewer than 5 total businesses, and the dominant category was NAICS 4521 (Department Stores). However, by 2010 there were close to 25 retail businesses in NAICS 7225 alone. The 1997 numbers reflect an embryonic business cluster.

In all five retail districts, an overall decrease in retail evenness was accompanied by the growth of restaurant services as a driver for a broad spectrum of other retail service development. With these findings in place, the study shifts to discussion and conclusion aimed at synthesis and interpretation of the overall results set.

5. DISCUSSION AND CONCLUSION

The purpose of this study was to identify key elements of the changing retail structure and diversity pattern within Denton's retail environment, with the goal of providing greater understanding of the concurrent development of different retail districts in the same city. Specifically, this research aimed to understand the evolving retail structure of Denton's retail districts from 1997-2010 in terms of district-level analysis of single versus chain location businesses, employment, and retail diversity and evenness measures of business mix. The following summarizes the major results for all three research questions before concluding with a discussion of implications and applications for the overall study findings.

Table 5: Simpson's Measure of Evenness (ED) by Year and Retail District

	i innary NAICS 4 Digit										
Year	CBD	Ν	Fry Street	Ν	Denton Crossing	Ν	University Drive	Ν	Golden Triangle Mall	Ν	
1997	0.71	23	0.65	9	*	4	0.36	23	0.52	21	
1998	0.74	21	0.53	10	*	4	0.30	23	0.57	20	
1999	0.61	23	0.64	11	*	5	0.30	23	0.51	20	
2000	0.67	22	0.73	11	*	5	0.28	23	0.50	20	
2001	0.71	24	0.68	10	*	9	0.39	23	0.43	23	
2002	0.61	25	0.56	10	*	9	0.41	23	0.47	21	
2003	0.56	26	0.53	10	*	11	0.29	27	0.37	23	
2004	0.67	23	0.51	10	0.74	15	0.26	26	0.39	23	

Simpson's Diversity Index (D) Primary NAICS 4 Digit

2005	0.60	27	0.56	9	0.61	14	0.26	25	0.40	23
2006	0.68	25	0.38	10	0.57	19	0.28	24	0.42	21
2007	0.66	26	0.43	8	0.54	19	0.29	24	0.40	20
2008	0.63	26	0.67	7	0.46	19	0.26	26	0.45	21
2009	0.58	24	0.67	7	0.38	20	0.22	27	0.42	21
2010	0.59	24	0.56	6	0.37	20	0.25	25	0.43	21

* Simpson's Measure of Evenness does not return a meaningful value when D=0 (i.e. when there is complete diversity in a district – see Table 4)

ED=0 indicates complete unevenness (all firms in one category, none in any other), while ED=1 indicates complete evenness (every category has an equal number of firms)

Table 6: Dominant 4-Digit NAICS Business Category by Retail District and Year

	19	97	2010			
Retail District	Dominant 4- Digit NAICS Category*	Total Retail/Service Firms in District**	Dominant 4- Digit NAICS Category*	Total Retail/Service Firms in District**		
CBD	4533	23	7225	24		
Fry Street	7225	9	7225	6		
Denton Crossing	4521	4	7225	20		
University Drive	7225	23	7225	25		
Golden Triangle Mall	7225	21	7225	21		

* NAICS 4521 = Department Stores; NAICS 4533 = Used Merchandise;

NAICS 7225 = Restaurants and Other Eating Establishments.

** The total number of business falling within the NAICS categories highlighted here.

5.1 SUMMARY

The first research question focused on an overview of how overall business numbers and structures of each of the five retail districts changed over time, considering the business types and employment totals hosted in each district. The cumulative analyses of absolute numbers of single and chain location businesses, as well as single to chain location ratios, reveal minimal change in the three oldest retail districts (Fry Street, University Drive, and the CBD), while the two newest retail districts in the city (Golden Triangle Mall and Denton Crossing, completely developed post-1980) experienced more substantial changes (mostly gains) in single and chain location businesses experienced the most changed the most of any of the five districts, with a notable trend evident toward even greater chain dominance.

Employment totals provide a final perspective on structural change in the five retail districts. Of note here is the reinforcement of single location business as the dominant employment driver in the CBD, as single location employment expanded in the district while chain employment fell. By contrast, although Denton Crossing experienced robust expansion in both single location and chain employment, chain businesses were by far the key employment factor in the power center. Of the other districts, Golden Triangle Mall and Fry Street as a pair displayed similar employment trends (moderate decline in single location employment, and moderate growth in chains), while University Drive lost jobs in both business types.

The second research question focused attention on the specific issue of change in retail diversity within and among the five retail districts. The analysis used Simpson's Diversity Index to depict change in retail district diversity by measuring the number NAICS 4-digit classifications present in each year. The key finding here is that all five retail districts experienced decreasing retail diversity, indicated by moderately increasing *D*-values, which coincides with the study expectations for this part of the investigation. Looking at individual districts, the CBD was the most diverse of the five districts, while Denton Crossing and Fry Street stand out in experiencing the largest diversity decreases of all districts. Although Fry Street's history dating to the 1960s might appear dissimilar to Denton Crossing's much more recent development, the fact that Fry Street experienced a redevelopment wave in the 1990s and early 2000s (cited earlier) is a key point of comparison with Denton Crossing's recent development. The occurrence of comparable business diversity change in the two districts is arguably the result of recent, parallel business growth trends in the two districts.

The third and final research area examined change in another specific measure of retail structure: the degree of evenness within the five retail districts. The study employed Simpson's Measure of Evenness in this analysis. Findings here suggest that substantial changes in evenness occurred from 1997 to 2010. All five retail districts experienced a decrease in retail evenness, indicating that a small number of NAICS 4-digit categories became more prominent in terms of total business numbers in each retail district. In all five districts and across all years, "Restaurants and Other Eating Places" (NAICS 4-digit code 7225) was the leading category, with two exceptions: the CBD and Denton Crossing, both in 1997. The decrease in retail evenness meets the study expectations stated earlier, but the overall agreement in the leading business category among all five districts does not. Rather than districts adapting to competition by focusing on distinctive leading business categories (the hypothesized competitive strategy of differentiation), the evidence here indicates that all five district business communities have come to pursue the same strategy of prominent inclusion of food and beverage services in their district business mix.

5.2 MAJOR CONCLUSIONS

Together, this complex set of findings suggests three major conclusions. First, while there are structural differences that distinguish the retail districts examined here, it is important to note that when considered individually most districts retained similar characteristics across the overall results set through the study period. This can be seen in terms of a high level of consistency in locations, employment totals, and single versus

chain location ratios for each business district individually. With measures such as diversity and evenness, where some change was notable across the district roster, it is important to note that in most districts very little change occurred, or if change was evident that change was in the same direction or all districts. Relative structural changes among the districts were thus few.

The single most notable district exception to this trend was Denton Crossing, the newest retail area studied, whose ongoing emergence through the study period made it a dynamic expansion zone for chain-based businesses. However, even this district is likely to support the overall consistency contention in a longer timeframe. Following its initial growth period, Denton Crossing's power center complex appears configured for extended competitive success based on the large scale and compelling value-for-money offered by the major retail players it hosts.

One qualification that deserves mention is to emphasize all study results emerge from analysis of the 1997-2010 period. Thus, the district characteristics observed should be noted as stable with consideration for that period only. Thus, we also need to recognize that longer-term retail trends, extending over multiple decades, can generate change that has the long-term potential to alter the distinctive characteristics of individual retail districts and developments. For example, the emerging, omni-channel retail landscape that combines information technologies with a vast array of logistical options is fundamentally changing how consumers navigate their path to purchase (Murray and Hernandez, 2016). This means that every store and retail district today, even the most successful and apparently stable, will need to evolve if they are to play a relevant role in the retail landscape that will exist in the next decades. However, in terms of solid evidence we can currently consider, the results at hand form the single best perspective available on the Denton retail district changes we can define with any certainty.

A second major conclusion is that, putting aside the issue of future developments, the study districts provide a compelling record of Denton's recent retail evolution. Denton Crossing, for example, provides a case of a larger principle that appears to operate at some level in each of Denton's districts: the age of the district relates to the structure of the district, and the newer the district, the more dominant the role of chain stores. In districts where chain stores dominate, these large-scale operations account for more employment but fewer total retail businesses. These findings are in line with those of Jones and Doucet (2000) and Jarmin et. al. (2009) who also find chain stores capturing market share and accounting for growing retail employment, while small, local retailers have declining employment levels. The growth of chain-store-dominant retail districts, and the concentration of retail offerings in a smaller number of large stores, is a defining feature of Denton's retail evolution.

However, for all the value offered by chain stores to consumers, a closer look indicates there is more to the Denton retail development story. A third major conclusion

is that Denton offers both a *cautionary case* and an *encouraging example* for business development in the face of a new power center opening.

- 1. University Drive is a cautionary case for businesses based in established retail strips. Even though this district has the advantage of being automobile-oriented in an automobile-dominated city, the fact that University Drive was the one district to experience both single-location and chain business employment losses is instructive.² While increased operational efficiency might account for some of this employment change, a more likely interpretation is an overall loss of competitive positioning among the established businesses in the district, particularly compared with Denton Crossing.
- 2. Denton's historic CBD offers an encouraging example of an established business district that, unlike University Drive, is succeeding in the presence of Denton Crossing's growing competition. What are the hallmarks of this success? It is helpful to contrast the key findings for both the CBD and Denton Crossing.
 - The CBD was characterized by an increase in single-location business employment, a decrease in chain employment, the highest level of business diversity among the retail districts, and a transition from used goods and electronics to a diverse cluster of consumer services, led by food and beverages.
 - Denton Crossing saw a boom in both single location and (especially) chain employment, and a transition to a low level of business diversity as the district emerged as the city's chain business value leader.

Based on these findings, the CBD has followed a distinctive trajectory compared with Denton Crossing in one key dimension, staking its competitive positioning on overwhelming strength in single location service businesses, and staying away from businesses that compete directly with Denton Crossing's large chain operations.

Despite the above distinctions, the one strategic element shared by the two deserves to be noted once again: each district saw substantial increases in number of food service establishments. While this common growth does not serve to differentiate the two, this expansion is consistent with Bodkin and Lord (1997), who interpreted this type of change as an outcome of convenience shopping. Overall, both districts appear to have developed unique and important competitive advantages, which in the CBD's case is instructive given the many other cases where power retail has out-competed single location businesses.

² A compelling argument can be made that an automobile orientation formed the basis for University Drive's decline with Denton Crossing's emergence. The mobility that gave birth to the University Drive strip in the 1950s thus might be seen as facilitating the migration of its customers to the growing cross-city competitor in the 2000s.

5.3 BROADER IMPLICATIONS

Although large retail chains continue to negatively impact local business districts by displacing small businesses, and single location businesses continue to find their survival challenged by forces outside their control, there remains a solid rationale for both chain and single location businesses to survive and thrive (Foster et. al., 2015). Large chains have an ability to organize marketing and logistical resources of unprecedented scale and complexity to serve markets that themselves are dynamic and multi-dimensional (Joseph, 2009; Kem, 2017). Concurrently, small and single location businesses provide local opportunities and create and preserve a sense of place that large chains cannot (Robare, 2016). Finding the competitive conditions that encourage a vibrant, competitive balance between these business types is thus important.

This study has addressed this goal by analyzing Denton's business community using ecological terms and tools with the goal of providing fresh insight into retail districts across the city. Yet, the case study addressed here represents only an initial application for this research approach, as it explores the retail districts of only one city. The study venue of Denton exists in a specific regional context that must be recognized for its location in a suburban county that is part of one of the most rapidly-expanding metropolitan areas in the United States (Hethcock 2019). What the present research has demonstrated as happening in Denton and its local business districts is linked to the social and economic circumstances that characterize the dynamic metropolitan economy that Denton is located within. Thus, to construct a thorough understanding of business district evolution, parallel research is needed for urban contexts that are markedly different from Denton. Clearly, complementary analyses are necessary to track the business district developmental paths in urban contexts that differ from Denton in one or more clear dimensions.

Examples of high-priority venues for such complementary investigation would include retail districts in the inner suburbs of large cities, retail zones situated within inner city (but not necessarily central business district) communities, and suburban business districts within moderate- or low-growth metropolitan areas. In each of these cases Ultimately, such research can address the needs of a wide range of retailers and service firms that are looking to identify new and innovative profit opportunities, and support the interests of local governments that wish to attract new business types to underserved communities. Investigation in this area offers benefits to a wide and interested business and public sector audience.

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