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## Dollar Stores in Illinois: Trading Areas, Consumer Behavior, and Impacts on Commercial Structure and Incumbent Retailers

### 1.0 Introduction

The structure of the US retail sector is changing, the exit or closing rate of US malls has tripled in the last few years and the 25% of the remaining malls are expected to close in the next seven years (Zomok, 2018). In contrast, the brick and mortar, small format, retail stores are growing eight to nine percent annually (Mergent, 2019). The growth in small format stores can be attributed to at least two factors: demographic shifts and changing consumer demand.

According to the US Census Bureau around 82% of the U.S. population lives in urban areas, up from 64% in 1950. For retailers this demographic shift translates to a business model focused on small stores, urban areas present limited real estate. Furthermore, present day consumers tend to spend less time in stores, online purchases replace more of the routine and stock-up shopping trips (Ogle, 2017). For the quick trips, in which a small amount of money is spent on immediate consumption, customers visit small format stores which support customers' on-the-go lifestyle (Ogle, 2017).

The 2008 recession has also altered the behavior of US customers, a growing number have switched to cheaper products (Bohlen et al 2009; Martinez et al 2014). This customer behavior has resulted in the growth of small-format dollar stores that are less than 10,000 square feet. The label 'dollar stores' applies to general merchandise, or multi-category discount stores mostly operated by chains such as the Dollar General, Dollar Tree and its subsidiary Family Dollar.

Table 1 shows the growth of dollar chains during 2000-2017, nationally, both Dollar General and Dollar Tree posted more than 5% annual growths. In contrast some brick-and-mortar chains are closing stores and reducing their workforce. For example, Gap is shutting down 230 outlets and liquidation sales are underway at Payless Shoes which is closing all 2,100 of its stores nationwide (Gray, 2019).

**Table 1: Growth of Dollar General, Dollar Tree, and Family Dollar: US and IL**

Chain	No. of Stores in 2000		No. of Stores in 2017		ACGR 2000-2017	
	US	IL	US	IL	US	IL
Dollar General	4294	203	14609	481	7%	5%
Dollar Tree	1383	403 <sup>1</sup>	6360	445 <sup>2</sup>	9%	1%
Family Dollar	3371	224 <sup>3</sup>	7974	224	5%	0%

**Note:** 1 refers to the Midwest states, the company’s Annual Report, 2000 doesn’t define Midwest;

2 includes IL, IN, and IA;

3 first author’s estimates; source: Dollar General’s, Dollar Tree’s and Family Dollar’s SEC filings.

The dollar chains benefit the customers with everyday low prices on multi-category of products such as packaged food, health and beauty, small electronics, automotive, and home office supplies. Economic benefits for the region in which the stores are located include employment, and tax revenue; Siegel (2019) posits that a Dollar General store creates nine new jobs and \$1.7mil in yearly sales. However, not all communities welcome the chain stores. Tulsa, Oklahoma, prevents the location of a new dollar store within a mile of an existing store; residents fear the stores deter other business especially in neighborhoods without options for healthy food (Bassinger, 2019). The Institute for Local Self-Reliance (2019) claims that dollar stores cut sales of nearby grocery stores by about 30%. Morris (2017) argues that dollar stores extract wealth from vulnerable, low-income communities leaving them to fall further behind.

Who are the target markets for the general merchandise discount chains: Dollar General, Dollar Tree and Family Dollar? Who frequently shops there? Do the chains locate their stores in places with few commercial structures? Do their entry into a community affect incumbent retailers’ sales? This paper addresses these and other related questions using Illinois as the geographical unit of analysis.

## 2.0 Trading Areas

A key decision for business is the determination of the most profitable ways to reach the market, the company faces a market-selection decision to locate the outlets (Athiyaman, 2019). Market selection is based on providing customer value, product and service benefits and payment terms are packaged to appeal to target markets. The company concentrates its financial and marketing resources on markets that represent the best profit potential.

In its latest SEC filings, Dollar General claims that the majority of its customers are value-conscious, many have low and/or fixed incomes, and are often among the first to be affected by negative or uncertain economic conditions and among the last to feel the effects of improving economic conditions particularly when trends are inconsistent and of an uncertain duration (Dollar General’s SEC filings, August 2019). The other two brands also target value-conscious customers: Dollar Tree offers merchandise at the fixed price of \$1.00, and Family Dollar provides consumers with a selection of “competitively-priced merchandise in convenient neighborhood stores” (Dollar Tree’s SEC filings, August 2019).

**Figure 1: Store Locations**

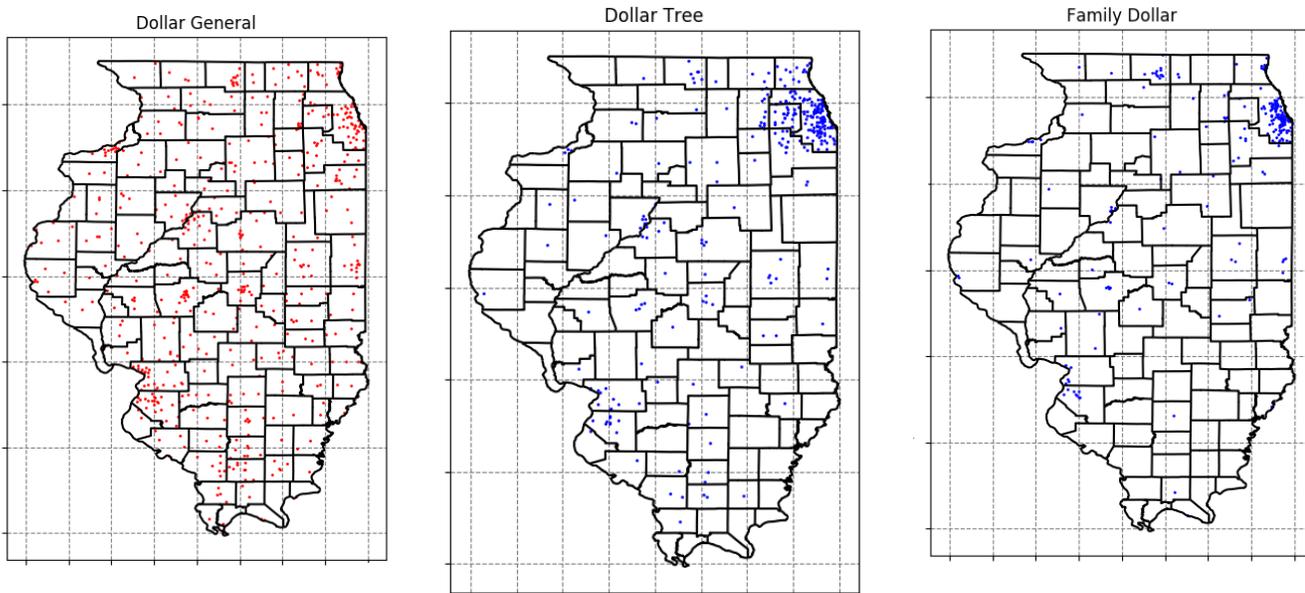


Figure 1 shows the locations of Dollar General, Dollar Tree, and Family Dollar outlets in Illinois. Dollar General's stores are spread across Illinois with 42% of the outlets in rural counties; Dollar Tree and Family Dollar are mostly concentrated in the metros; they operate around nine-out-of-10 stores in the metro counties. Since 90% of all expenditures in discount stores are made within a mile or so from the family residence (Blut et al 2018), we use census 'place' as the unit of analysis to highlight the demographics of the trading areas (Table 2). Illinois has 1367 census places: 300 cities, 16 towns, 983 villages, and 68 census designated places (US Census, Guide to State and Local Census Geography). We group these places as rural or urban and provide summary statistics of the dollar stores trade regions' socioeconomic conditions (Table 2).

Table 2 shows that of all the three discount chains, Dollar General is most active in sparsely populated rural areas where majority of households earn 45% less than the state median income of \$79,168. In contrast, Dollar Tree targets urban households where the income disparity, compared to the state average income, is around 20%. Family Dollar trades in urban regions with a higher concentration of African-Americans.

In summary, there is a higher likelihood of Dollar General entering and serving rural communities, a 62% chance for Dollar General compared to a 19% chance for the other two brands.

**Table 2: Socioeconomic Profile of Discount Chains' Trading Areas in Illinois**

Measure	Dollar General		Dollar Tree		Family Dollar	
	Rural (42%)	Urban (58%)	Rural (13%)	Urban (87%)	Rural (13%)	Urban (87%)
Avg. Population	6,596	171,239	21,270	472,160	13,180	579,072
Female	51%	51%	51%	51%	52%	51%
Male	49%	49%	49%	49%	48%	49%
Proportion African Americans	3%	13%	5%	17%	7%	30%
Age LT 50	62%	66%	63%	67%	61%	67%
Proportion with Bachelor Degree	11%	16%	17%	20%	11%	16%
Mean No. of Housing Units	4,361	23,210	8,513	180,918	5,550	222,102
Owner Occupied	70%	67%	66%	64%	63%	46%
Mean No. Employed, 16+	2,862	81,972	10,016	227,735	5,788	278,155
Labor Force Participation	58%	64%	61%	65%	59%	64%
Mgt. Occupations	26%	32%	33%	36%	28%	39%
Service Occupations	21%	20%	20%	18%	21%	19%
Median Income	\$43,703	\$54,172	\$52,523	\$60,543	\$42,310	\$51,312
HHs Earning less than \$50,000	56%	46%	45%	40%	58%	50%

Source = ACS, 2017 Five-year estimates.

## 3.0 Consumer Behavior

In a business, the owner's equity is assessed by subtracting business liabilities from total assets. This methodology applied at the brand level is called brand equity, brand assets such as "brand loyalty" and brand liabilities such as "customer dissatisfaction" are used in brand equity computations. Published brand equity scores for discount stores place Dollar Tree at the top of the metric; Dollar General is ranked below Dollar Tree (see [www.theharrispoll.com](http://www.theharrispoll.com)). Brands ranked below the discount-store category average in alphabetical order include: 99Cents Only, Big Lots, Family Dollar, and Five Below.

Who contributes to the brand equity of the discount chains? Answering this question should help us understand the segment of the population that benefits the most from

the discount stores, people who make 10-14 visits to the stores in a 30-day time period.

The loyal discount-store customer tends to be a minority female (African-American or Hispanic), high school graduate, 25-34 years of age with a household income of less than \$30,000 (Table 3). At the store, she is 68% more likely to buy canned meat than the general population (MRI, 2018). Note that the discount chains market-selection decisions or target markets correlate with their served markets: economically disadvantaged, value-conscious customers.

In summary, the chance of an African-American shopping at the Family Dollar store is 214% more than the general population; for Hispanics the likelihood of shopping at a Dollar Tree is 98% more than the general population.

**Table 3: Profile of Shoppers: 10-14 trips in 30 Days**

Indicator	Dollar Tree	Dollar General	Family Dollar
Women	66% (127) ↓	53% (102)	58% (111)
High School Graduate	38% (133)	45% (156)	40% (139)
Age 25-34	24% (135)	22% (124)	31% (173)
Occupation: Employed, other	25% (143)	20% (114)	28% (160)
HH Income \$20,000-\$29,999	16% (196)	16% (196)	NA
HH Income LT \$20, 000	18% (156)	18% (154)	24% (204)
Race: African-American	26% (215)	14% (111)	38% (314)
Race: Spanish or Hispanic	31% (198)	19% (117)	22% (137)
Spanish spoken in home	34% (203)	18% (107)	21% (122)
E-Commerce: eBay	22% (118)	NA	NA
Social Media: Snapchat	27% (124)	NA	30% (138)
Social Media: Facebook	NA	71% (110)	NA

Source: MRI, 2018

**Note: i** The figures in parentheses are likelihoods. For example, women are 27% more likely than the general population to visit Dollar Tree 10-14 times during a span of 30 days; NA: Data not available.

## 4.0. Impacts on Commercial Structure

A large body of theory and empirical evidence demonstrates that regional population has predictable requirements for consumer goods and services (Athiyaman, 2019). Our focus here is on the capacity of the commercial structure of the places that contain the chain stores to service the needs of the residents, commercial structure is defined as brick-and-mortar establishments in the retail sector. We evaluate the commercial structure of a place using three equations adapted from Athiyaman (2019). In the first equation, the total expenditures for current consumption in a place is determined:

$$E = C \times I \times a \times b, \text{ where}$$

E = Expenditures for current consumption;  
 C = Consumer units, number of households;  
 I = Median household income, before taxes;  
 a = Tax ratio, and  
 b = Expenditures ratio

The second equation estimates annual expenditures in retail establishments in the places where the discount stores are located:

$$T = d \times E \times e \times f, \text{ where}$$

T = Expenditures in retail line of trade in the market area;  
 d = Percentage of expenditures for current consumption on retail trade;  
 e = Shopping pattern ratio, and  
 f = Trade flow ratio.

The third equation estimates the recommended number of establishments for each line of retail trade:

$$S = \frac{T}{g}, \text{ where,}$$

S = Recommended number of establish-

ments for each line of retail trade; and  
 g = Average dollar sales for each line of trade.

To illustrate, the total annual expenditures for current consumption by the residents of McDonough County works out to \$516.75mil:

$$E = C \times I \times a \times b$$

$$E = 11,481 \times \$42,911 \times 0.9607 \times 1.0918$$

$$E = \$516,748,510$$

The percentage allocation for expenditures for current consumption in variety or discount stores is 15.123%. Calibrating equation 2 also requires data on shopping pattern, we assume that 90% of expenditures in discount store will be spent locally in the county (Blut et al, 2018; Kahn, and Schmitlein, 1989). To adjust for trade flow, that is the import expenditures of nonresidents and residents' expenditures outside the market area, we use location quotients (LQS; Athiyaman, 2019). To avoid overestimating the number of variety stores needed for the county we cap the LQs greater than 1 at 1.0, but use the actual number if the LQ is less than 1. For McDonough, LQ for general merchandise (NAICS 452) is 2.85 so we cap it at 1.0. Thus the total annual expenditures in variety stores located in McDonough County are estimated to be \$73.06mil:

$$T = d \times E \times e \times f$$

$$T = .157097 \times \$516.75 \text{mil} \times .9 \times 1.0$$

$$T = \$73,061,677$$

Finally, to determine the recommended number of variety stores for McDonough, we calibrate equation 3 with the average sales figure for variety or discount stores in the region:

$$S = \frac{T}{g}$$

$$S = \frac{\$73.06 \text{mil}}{\$9.86 \text{mil}} = \sim 7$$

Table 4 provides variable definitions and data sources for the equations. Table 5 shows the results of model calibration for rural Illinois, fitting the equations with data.

**Table 4: Definitions of Variables and Data Sources**

Variable	Definition	Data Source
E	Household expenditure on current consumption.	Product of the variables: $C I a b$
C	Number of households (HH) in the county	2017 ACS five-year estimates
I	Median HH income in the county	
a	Tax ratio: $1 - \text{tax rate for median HH income}$	Calculated by the first author using Federal and State tax laws.
b	Expenditure ratio: $\frac{\text{Mean Expenses for the Income Group}}{\text{Median HH Income}}$	Consumer Expenditure data, BLS
T	Expenditures in retail trade in the county	Product of the variables: $d E e f$
d	Proportion of current consumption expenditure spent on general merchandise	Consumer Expenditure data, BLS
e	Proportion of the resident population shopping for general merchandise within the county	Based on empirical generalizations in marketing.
f	Indicator to account for retail leakage and imports, LQ coefficient	Location Quotients for counties extracted from BLS
S	Recommended commercial structure for retail in the county	Computed using the ratio: $\frac{T}{\bar{g}}$
g	Average dollar sales for general merchandise industry in the county	Illinois Department of Revenue

Seven variety stores are recommended for McDonough County, the actual number as at 2018 was also seven. This recommendation is based on the average sales revenue of the seven stores. It is possible that one or more variety stores such as Walmart could account for most of the sales revenues that are used to compute the average sales. Hence, caution needs to be exercised in basing economic development decisions about number of variety stores that the county can support on this one model

alone (see Athiyaman (2019) for examples of combining different decision models to enhance predictions).

Table 5 lists the 29 rural counties with over and under-capacity in commercial retail structure; data limitations prevent us from calibrating commercial structure equations

**Table 5: Commercial Structure of Rural Illinois Counties**

<b>Counties</b>	<b>Number of General Merchandise Stores including Dollar Stores as at 2018</b>	<b>Number of Dollar Stores</b>	<b>Recommended Commercial Structure</b>	<b>Commercial Structure: Over or Under Capacity?</b>
Adams County	22	9	41	Under
Christian County	10	6	11	Under
Clay County	6	2	3	Over
Coles County	15	8	10	Over
Effingham County	13	8	5	Over
Fayette County	7	5	3	Over
Franklin County	13	10	48	Under
Iroquois County	6	4	8	Under
Jefferson County	17	9	44	Under
Jo Daviess County	11	3	10	Over
Knox County	15	6	9	Under
LaSalle County	28	15	27	Over
Lee County	8	4	4	Over
Livingston County	9	7	7	Over
Logan County	7	5	4	Over
Marion County	9	7	8	Over
McDonough County	7	5	7	At Capacity
Montgomery County	8	6	8	At Capacity
Morgan County	15	8	10	Under
Ogle County	9	8	14	Under
Randolph County	10	10	14	Under
Richland County	5	3	2	Over
Saline County	8	6	4	Over
Stephenson County	10	5	17	Under
Tazewell County	33	20	45	Under
Union County	8	5	4	Over
Wabash County	3	2	7	Under
Warren County	6	4	62	Under
Whiteside County	16	9	14	Over

for all of the 63 rural counties. Dollar stores are majority of the general merchandise establishments in these 29 counties, dollar stores constitute around 60% of the variety stores.

In terms of competition, on average there are 1.5 dollar stores for every other general merchandise store in the region. In eight counties, there are more dollar stores than

what the counties need in terms of general merchandise stores; for example, Fayette County needs three general merchandise stores, but they have a total of seven including five dollar stores (Table 5).

## 5.0. Impact on Incumbents' Retail Sales

In retail sector, there is an enduring market share advantage for order of entry (see Athiyaman, 2011). Thus, for example, if Dollar General is the first variety store to enter McDonough County then it will enjoy an enduring market share leadership. If another variety store, say Big Lots, enters the market next, it will command a 42% market share; Dollar General will still be the market leader with a 58% share. The general size-of-share ratio is 0.71, in our example the ratio of Big Lots market share is 0.71 of Dollar General's market share (42 divided by 58 is approximately 0.71).

How could we use the size-of-share ratio to assess the impact of dollar store entry into a region? Take for example, Christian County;

Table 5 shows that the region has 10 variety stores but it could accommodate one more. If we apply the general size-of-share ratio to the 10 existing stores, then the pioneer store will have 30% market share, the second entry 21%, etc. (Table 6). These are at-par market share, it is assumed that the market is stable with little or no growth in customer numbers and the stores are similar in structure (for example, size of the outlet) and conduct (for example, marketing).

Thus, given the 0.71 size-of-share ratio, the 11th entry into the general merchandise category in Christian County will take in 1% share of the market or approximately \$790,000 in revenue<sup>1</sup>. On average, the existing variety stores in Christian County will lose \$79,000 in revenue.

**Table 6: Expected Market Shares for Variety Stores Based on Order of Entry, Unit is in %**

Order of Entry	1	2	3	4	5	6	7	8	9	10
1	100									
2	58.5	41.5								
3	45.2	32.1	22.8							
4	38.9	27.6	19.6	13.9						
5	35.4	25.1	17.8	12.7	9.0					
6	33.3	23.6	16.8	11.9	8.5	6.0				
7	31.9	22.7	16.1	11.4	8.1	5.8	4.1			
8	31.0	22.0	15.6	11.1	7.9	5.6	4.0	2.8		
9	30.4	21.6	15.3	10.9	7.7	5.5	3.9	2.8	2.0	
10	30.0	21.3	15.1	10.7	7.6	5.4	3.8	2.7	1.9	1.4

<sup>1</sup>The sales revenue for the retail industry in the county is estimated to be around \$81.71mil, estimated by the first author using county tax rates.

## 6.0. Summary and Conclusions

Dollar stores target value-conscious customers; the stores' loyal customers are mostly minority, African-American and Hispanic female in the 25-34 age group. A common belief among community development practitioners is that the dollar stores cluster in regions with little or no grocery stores. Our research shows that dollar stores operate both in regions with dense and sparse commercial structures. Similarly, the argument that a dollar store entry takes away 30% of business from incumbent retailers is fallacious<sup>2</sup>, market share changes are governed by empirical laws; any entry into a marketplace is bound to change the existing structure of the marketplace.

Here is our prescription for community developers wanting to assess the impact of new variety store entry into their region:

- √ Examine the commercial structure of the county using the method prescribed in this paper. If there is room for a new store, then assess the market share implications of the new entry.

In at-par situations, employment numbers and tax revenues will not change for the region because of the new entry; the new entry will take share away from the existing stores and the community may see a redistribution of retail revenue and employment, employees from incumbent retailers may switch to the new store. The benefits of the new store would be mostly for the consuming public, ease of shopping, for example.

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<sup>2</sup> See the research reported by the Institute for Local Self-Reliance, 2019.

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