The importance of variety to retail centers: evidence in Ohio

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Abstract. The economic performance of a retail market center or shopping district depends on many factors. There has been debate in the literature about the importance of retail concentration and retail variety to a center's performance. A concentration of similar types of retail stores allows customers to comparison shop. A diverse retail center, however, provides customers the ability to complete multipurpose shopping trips.

We present supporting evidence on the importance of variety to retail centers as well as evidence that some types of stores benefit from the agglomeration of complementary stores. Our findings confirm the importance of variety to retail centers. The evidence is derived from two sources of data: surveys of consumers and retail businesses and retail sales and establishment data by Ohio zip code area. The surveys of consumers and retail businesses find that both consumers and business managers rank the variety of merchandise available and the variety of stores in a center as important.

Additional empirical evidence is available from a correlation of total retail sales in Ohio by zip code areas to a measure of retail store variety, a modified Herfindahl index. We find that retail variety is significantly correlated with total retail sales (0.493). Finally, studying the sales of nine retail merchandise categories using seemingly unrelated regression analysis we find that increased variety is significant in explaining increased sales in all merchandise categories. Our analysis also provides evidence of the complementary nature of various categories of retail store types.

1. The importance of variety in shopping decisions

Consumer shopping decisions lie at the heart of retail center development. The shopping center manager or economic development practitioner whose job relies on maintaining a vibrant retail downtown or retail center has much to gain from a better

understanding of what attracts a consumer to a retail center. The atomistic consumer wishes to minimize the costs associated with shopping for a good while maximizing the opportunity to attain the greatest value while on the shopping venture. Likewise, retail businesses find it advantageous to locate within a vibrant retail center. Mulligan (1984) recognizes that the interplay of consumer shopping costs and opportunities and the interrelationships among retail businesses are agglomeration economies in retail shopping.

Central place theory (Christaller 1966) provides a foundation for modeling and explaining community retail markets. Firms find it advantageous to locate in a central city to supply the consumer demand around the periphery. The agglomeration of firms builds on itself, and a regional system of places based on the range of goods available at each center develops. There are, of course, various modifications necessary to make central place theory a more complete model of the retail markets in the 1990s.[1] The nature of retail stores locating together, however, is the focus of central place theory (Vandenbroucke 1995).

The agglomeration of retail stores reduces indecision and uncertainty for the consumer (McLafferty and Ghosh 1987; Lippman and McCall 1979 and 1981; Brown 1989). Brown (1989) points out two important characteristics of agglomeration in retailing. First, there is the clustering of similar types of stores that have variable demand, such as antique dealers or automotive dealers. These types of stores, sometimes called *nonconvenience stores*, benefit from clustering because of the ability of consumers to comparison shop. Stores with less variable demand or those that sell convenience goods tend to be more spatially distributed (e.g., grocery stores). Personal experiences and other evidence (including the importance of multipurpose shopping trips), however, suggests that a variety of convenience and nonconvenience stores at a shopping center offers advantages to both types of stores (Brown 1979; Eaton and Lipsey 1982, Thill 1992; Vandenbroucke 1995).

Consumers may be more attracted to retail centers with higher variety if their shopping trip is intended for nonconvenience items (Holden, 1991; Leistritz, 1989; Linder, 1995) such as apparel, furniture, and durable goods. A center with a greater variety of stores, therefore, may be more attractive to the consumer who wishes to minimize the cost of travel between different types of stores.[2] Shoppers, however, are more likely to shop at the closest center for convenience items (Holden, 1991; Leistritz, 1989; Linder, 1995).

Consumers make choices on their shopping destination by weighing several factors associated with the purpose of the shopping trip. For instance, if a family needs a loaf of bread, the most important factor in their shopping decision is the distance to the nearest grocery or convenience store, holding price and quality constant. If the family is shopping for a new outfit for the daughter and perhaps considering the purchase of a new sofa, however, the opportunity to comparison shop while at one loca-

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[1] Suggested modifications include adding urban complexity, multitrip shopping, and intervening opportunity models, to name only a few.

[2] We recognize the cost of distance in consumer shopping decisions. Our data, however, do not permit the inclusion of this effect.

tion becomes an important factor in choosing a destination for the shopping trip. The decision of where to shop and what to purchase has been the focus of economic and consumer marketing research for years (Faison 1977; Rogers 1979; Walzer and Stablein 1981).[3]

Marketing and economic research has verified many families' intuitive consumer shopping destination decisions. Huff (1963) sets the stage for much of this work in his consumer spatial modeling. His probabilistic modeling approach to measure consumer demand for a proposed shopping center takes into account the center's variety. He proposes that consumers are attracted to the center that offers the greatest "number of different types of goods." Martin (1990) emphasizes that a greater variety of goods supports more successful retail centers. In a survey of rural residents in Georgia, Brooks and Searcy (1996) also find that consumers prefer downtown shopping areas with a wide variety of stores. Growing numbers of retail superstores (e.g., Walmart, Meijer, etc.) that offer a wide variety of merchandise lines (many even offering grocery items) take advantage of the importance of one-stop, high variety shopping to attract customers.

Our review to this point, although not complete, outlines that the importance of variety has been theorized and well documented. The retail mix of stores defining variety, however, has not been the focus of much empirical research. Shonkwiler and Harris (1996) may be breaking ground in this area in their analysis of rural retail interdependencies. If variety is important, then understanding the mix of retail stores that is most effective in attracting consumers is the next logical step in this line of inquiry.

Our research focuses on the variety of stores available at a shopping center.[4] Our intent, using data from Ohio, is to provide additional evidence of the importance of variety to retail centers. The importance of variety should not be confined to traditional shopping centers or regional malls. Rural downtowns or shopping centers should be concerned with attracting and maintaining a diverse shopping base. Because the cost of distance is more important to rural residents, shopping center variety may be more important to rural retail downtowns and centers.

Our analysis also permits an initial discussion on the most effective retail mix of stores in a shopping center. After showing the importance of variety, we are interested in learning more about complementary types of retail establishments in shopping centers.

We recognize and warn the developer, however, to keep in mind the *place* or *order* of each retail center in the larger hierarchy of central places. Within the order of central places, each retail center has its own market limit. This is used as the basis

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[3] Marketing researchers have paid considerable attention to consumer shopping decision making. The breadth of this research is beyond our scope.

[4] It is clear, intuitively and theoretically, that consumer shopping decisions include other factors such as product prices, customer service, and other demographic and socioeconomic factors. For clarity, we exclude the importance of these other factors in our analysis and focus on the variety of stores at shopping destinations and suggest that in the absence of more precise data the variety of stores acts as a proxy for the variety of products.

for estimating necessary market sizes (populations) for different classes of retail stores. We employ a measure of the shopping center's retail share of the state's sales as a proxy for the order of the center. Regardless of the market size, the variety of retail opportunities at a center is an important factor in the success of the center.

2. Evidence on the importance of variety

We present three empirical cases that provide evidence demonstrating the importance of retail variety on the overall performance of retail centers. First, a consumer survey in Northwest Licking County, a rural community in Ohio, provides evidence of the importance consumers place on variety. Second, retail business surveys in the counties of Crawford, Fayette, and Lucas and the city of Upper Arlington show that retail businesses recognize the importance of retail variety. Finally, an empirical analysis using retail sales and the number of establishments by Ohio zip code areas provides additional evidence on the importance of variety to retail center performance.

2.1 Northwest Licking County consumer survey

The importance of retail variety on consumer shopping decisions is evident in a recent consumer survey in Northwest Licking County, Ohio. Northwest Licking County still retains much of its old community village appearance although it is located between the larger cities of Columbus and Newark, Ohio. This survey was a random mail sampling of three small communities.[5] Respondents were asked to rank five changes that would increase their local shopping decisions. Improved merchandise selection and an increased variety of stores rank second and third behind more competitive prices (Table 1). Sixty-three percent of the survey sample identify an improved selection of merchandise and 55 percent select an increased variety of stores as a necessary change.

Table 1. Consumer survey, selected results

Change to attract customer	Percent of times ranked[a]
More competitive pricing	64
Better election of merchandise	63
More variety of stores	55
More places to eat	41
Better quality merchandise	39

[a] Number of times change ranked as 1, 2, 3, 4, 5 divided by total sample, 180
Source: Northwest Licking County R&E report (Hushak, Pai, and Holden 1995)

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[5] The Northwest Licking County consumer survey was compiled as part of the Northwest Licking County business retention and expansion program (Hushak, Pai, and Holden 1995).

2.2 Retail business surveys

Recent retail and service business surveys provide additional evidence supporting the importance of retail variety for shopping centers. The survey results are from two urban and two rural business community surveys.[6] The two urban communities, however, account for approximately 67 percent of the sample. Aggregated, these business surveys include responses from 266 retail and service establishments.[7]

When asked to rank merchandising improvements for their immediate business area, the variety of merchandise ranks first more often than other items (Table 2). Variety ranks higher than improvements to advertising, prices, and operating hours. Nearly 18 percent of the retail establishments rank the variety of merchandise as the most important needed improvement for their retail center, and 11 percent rank it as the second most important needed improvement.

Table 2. Retail business surveys, selected results

Improvement	Percent of times ranked 1st	Percent of times ranked 2nd
Price	9.02	5.26
Variety of merchandise	17.67	10.53
Management skills	4.89	1.50
Store displays	0.75	5.26
Store hours	5.64	4.89
Special promotions	5.26	12.78
Advertising	9.40	8.65

Source: Selected business surveys completed by the Ohio business retention and expansion program (See text.)

2.3 Analysis of retail sales in Ohio by zip code areas

The evidence from the consumer and business surveys motivated us to look more closely at the relationship between shopping center variety and retail performance. We use data collected by Market Statistics for this analysis.[8] Retail sales and establishment data for 1,225 zip codes in Ohio are available to estimate the relationship

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[6] These surveys include the urban communities of Upper Arlington and Toledo. Upper Arlington, located in Franklin County, is a self-organized community within the Columbus metropolitan market. Home to a relatively affluent, upper-middle class population, it boasts two large retail shopping centers and other subregional centers. The Toledo R&E survey focuses primarily on tourist-related retail establishments. The rural community surveys took place is various communities in Crawford and Fayette counties.

[7] The surveys were completed as part of the Upper Arlington business retention and expansion program (Holden and Kraybill 1996), Lucas County business retention and expansion program (Hushak and Black 1995), Crawford County business retention and expansion program (Black and Kraybill 1996), and the Fayette County business retention and expansion program (Holden and Kraybill 1996).

[8] Market Statistics is a division of Bill Communications (Market Statistics Primary Data Base #3 1994).

between total retail performance and the variety of stores in each zip code area in Ohio. To complete this analysis a Herfindahl index (HI) is constructed.[9]

We construct a Herfindahl index to measure the diversity of retail sales for each zip code area (equation (1)). An area with no diversity will have a Herfindahl index equal to one, and a zip code area with a more diverse population of retail establishments will have a larger value.[10] Sales and number of stores data are available for nine merchandise categories (automobiles, apparel, building and materials, eating and drinking places, general merchandise, food stores, gasoline service stations, furniture and home appliances, and drug stores).

(1) $HI_z = [\sum_m SN_{mz}^2]^{-1}$

where:

(2) $SN_{mz} = \dfrac{N_{mz}}{\sum_m N_{mz}}$;

N_{mz} = The number of stores in merchandise category m in zip code z;

SN_{mz} = The share of stores in merchandise category m in zip code z.

The correlation between total retail sales (TRS) and HI is calculated to see if a relationship between the retail performance of an area and the diversity of stores in the zip code area exists. The correlation (Table 3) shows that there is a positive and significant relationship between total retail sales and the Herfindahl index, as expected.

The correlation results alone, however, do not capture other important market characteristics. In particular, we are interested in controlling for the effects of income, market share, and the sales per store of other complementary products to determine variety's influence on retail sales.

First, we construct a system of equations with one equation for each merchandise category (equation (3)). The dependent variable for each equation is the sales per store. The independent variables in the system are the sales per store for the other merchandise categories, the effective buying income for the county in which the zip code area is primarily located,[11] the merchandise category's total market share, and the Herfindahl index. The HI measures the overall variety of products sold within the zip

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[9] The HI was initially developed to measure the diversity of industrial sales in communities. Holden and Deller (1993) apply it to retail market performance.

[10] Our HI is the inverse of the traditional HI in which the value of HI equals one for markets with no diversity and approaches zero for more diverse markets (Holden 1991).

[11] *Effective buying income* is defined as after tax or disposable income. We use county income figures reported in *Sales and Marketing Management* (August 30, 1994) for all Ohio counties.

Table 3. Correlation between total retail sales and retail variety index

Pearson correlation coefficient	HI (Herfindahl index)
TRS (total retail sales)	0.49346
N = 1038	Probability = 0.0001

code area and is expected to be positively related to sales per store. Market share, a measure of volume, is expected to be positively related to sales per store, and effective buying income also is expected to be positively related to sales per store.

(3) $SS_{mz} = f(HI_z, EBI_z, SS_{iz}, MS_{mz})$ for $i \neq m$

where:

SS_{mz} = The sales per store for the mth merchandise category in zip code z;

EBI_z = The disposable income for the county in which the zip code z resides;

SS_{iz} = The sales per store of the ith merchandise category in zip code z for $i \neq m$; and

MS_{mz} = The market share of merchandise category m in zip code $z = (RS_{mz} / \sum_z RS_{mz})$ where RS_{mz} is the retail sales of merchandise category m in zip code z.

After finding contemporaneous correlation among the equations in the system, the system of equations is estimated using seemingly unrelated regressions (SUR).[12] Coefficient estimates are presented in Table 4. The means, variance, and standard deviations of the variables used in the analysis are presented in Table 5.

3. Discussion

Evidence supports the importance of variety to retail center performance. First, consumer surveys indicate shoppers' desires for variety (Table 1). Business surveys support the literature on agglomeration economies that suggests that retailers benefit from a greater variety of stores (Table 2). Finally, we have empirical evidence on the correlation between shopping center variety and the center's sales performance (Table 3). There are many factors that influence a consumer's attraction to a retail center. In this analysis we focus on the variety of stores in a retail center. In our system of equations we find supporting evidence on the importance of variety to center performance and indications of complementary types of retail stores.

We use two control variables, income and market share, in our empirical analysis. Income is a positive and significant influence for eating and drinking places, gen-

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[12] The system of equations is tested for contemporaneous correlation using the test described in Judge *et al.* (1988), p. 456.

Table 4. Coefficient estimates[a]

Dependent variable	Independent variables											
	Income	EDP	Food	GM	App	FHA	Auto	Gas	BM	Drug	HI	MS
Eating, drinking places	.000006		-0.009	0.0009	-0.022	0.0167	0.0021	0.028	-0.0057	-0.031	33.57	76829
	(3.57)*		(1.24)	(0.05)	(0.66)	(1.06)	(0.65)	(2.61)*	(0.65)	(2.89)*	(7.49)*	(8.77)*
Food	-.0000181	-0.204		-0.0103	-0.2727	-0.0359	-0.0081	0.0712	0.095	0.152	138.03	502647
	(2.92)*	(1.99)*		(1.64)	(2.21)*	(0.63)	(0.69)	(1.79)**	(2.99)*	(3.81)*	(8.51)*	(14.27)*
General merchandise	.000108	0.4808	0.3861		2.7896	-0.4456	0.1895	-0.1631	-0.1305	-0.9971	178.97	1626438
	(4.57)*	(1.22)	(3.74)*		(6.06)*	(2.01)*	(4.24)*	(1.07)	(1.06)	(6.56)*	(2.81)*	(26.58)*
Apparel	.0000102	0.0111	0.0047	0.0086		0.0391	-0.0037	-0.0047	0.0071	0.0599	14.37	28725
	(7.33)*	(0.47)	(0.76)	(5.91)*		(2.96)*	(1.39)	(0.51)	(0.96)	(6.67)*	(3.77)*	(8.60)*
Furniture, appliances	-.0000013	0.0550	0.0175	-0.009	0.1146		0.0013	0.0635	0.0072	0.0009	57.22	158804
	(0.47)	(1.17)	(1.43)	(3.28)*	(2.07)*		(0.23)	(3.49)*	(0.49)	(0.51)	(7.67)*	(18.08)*
Automobile	.000066	0.2331	0.0655	0.0176	-0.7943	-0.0213		0.2418	-0.1549	-0.0124	182.22	1261319
	(5.19)*	(1.11)	(1.18)	(1.37)	(3.18)*	(0.18)		(2.96)*	(2.36)*	(0.15)	(5.36)*	(25.68)*
Gasoline & service	.0000090	0.1282	0.0175	-0.0189	-0.2607	0.0323	0.0107		-0.0041	-0.0771	46.63	436738
	(2.24)*	(1.94)**	(1.01)	(4.71)*	(3.32)*	(0.86)	(1.42)		(0.20)	(2.97)*	(4.37)*	(19.73)*
Building materials	.0000048	-0.0888	0.0865	-0.0198	-0.0114	-0.0077	-0.0111	0.0341		-0.1424	75.49	535352
	(1.02)	(1.14)	(4.27)*	(4.17)*	(0.12)	(0.17)	(1.26)	(1.13)		(4.73)*	(6.05)*	(25.87)*
Drugs	.0000183	-0.0917	0.1199	-0.0308	0.2977	0.0665	0.0091	0.0338	-0.0230		50.69	460765
	(5.41)*	(1.62)	(8.21)*	(9.04)*	(4.47)*	(2.11)*	(1.41)	(1.54)	(1.31)		(5.56)*	(33.26)*

[a] t-values are in parentheses

* Indicates significance at 5 percent level

** Indicates significance at 10 percent level

Table 5. Variable means, variances, and standard deviations

Variables	Sum	Mean	Variance	Std deviation
FOOD	1,748,591	1,427.421	2,241,447	1,497.146
EDP	416,920	340.343	129,192	359.433
GM	2,935,771	2,396.548	40,122,609	6,334.241
App	243,906	199.107	121,621	348.742
FHA	564,899	461.142	483,709	695.492
Auto	2,809,178	2,293.207	12,112,260	3,480.267
Gas	973,573	794.754	857,098	925.796
BM	1,012,879	826.840	1,441,719	1,200.716
Drug	974,652	795.635	1,339,000	1,157.152
Income	5,509,173,137	4,497,284	3.91E+13	6.25E+06
HI	5,977	4.880	7.58	2.754
MS-Food	1	0.000816	1.88E-06	0.001
MS-EDP	1	0.000816	2.32E-06	0.002
MS-GM	1	0.000816	5.93E-06	0.002
MS-App	1	0.000816	7.48E-06	0.003
MS-FHA	1	0.000816	4.67E-06	0.002
MS-Auto	1	0.000816	3.12E-06	0.002
MS-Gas	1	0.000816	1.71E-06	0.001
MS-BM	1	0.000816	2.45E-06	0.002
MS-Drug	1	0.000816	2.84E-06	0.002

Abbreviations: FOOD for food stores, EDP for eating and drinking places, GM for general merchandise, App for apparel, FHA for furniture and home appliances, AUTO for automobile dealers, Gas for gasoline service stations, BM for building merchandise stores, Drug for drug stores, Income for effective buying income, HI for Herfindahl index, MS-category for the market share of each merchandise category

eral merchandise stores, apparel stores, automobile stores, gasoline stations, and drug stores. Income is negative and significant, however, for food stores. We generally would expect income to be positively related to retail sales. In rural areas, however, income has been shown to be positively correlated with community out-shopping (Herrman and Beik 1969; Papadopoulos 1980). Food sales, in particular, may have an inverse relationship with income. Lower income families generally spend a higher proportion of their income on food purchases than higher income families. Likewise, as income rises families may be more likely to spend a higher proportion of their income at restaurants, thereby spending a smaller proportion at food stores. This may be particularly true of two wage earner families.[13]

The income measure we use has limitations that may affect the analysis. Our measure of disposable income is taken from county level data. Our sales and store data, however, are based on subcounty zip code areas. A better, more consistent, measure of income would be zip code area income—a measure not available to us.

We use the market share of the dependent variable as a proxy for the place of the shopping center in the order of central places. Market share is positive and significant in all estimated equations. These results are reassuring, confirming what central place theory tells us about the importance of a center's market position.

Further examination of the empirical data provides additional insight into the role of variety in retail center performance (Table 4). After controlling for the market

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[13] The authors would like to credit the comments of an anonymous reviewer for this interpretation.

share, income, and sales per store of other products, we find that variety, as measured by a Herfindahl index, is significant in explaining sales per store for all nine merchandise categories in our analysis. Furthermore, retail center variety is positively correlated with sales per store in each merchandise category.

Current research by Shonkwiler and Harris (1996) provides "substantial evidence for interdependencies among retail sectors selling complementary goods." There are several significant relationships in our system of equations supporting their research. For example, the sales per store for food, apparel stores, and automobile dealerships are positive and significant in explaining the sales per store for general merchandise stores. Additionally, furniture and home appliance, and drug stores are negative and significant in explaining the sales per store for general merchandise stores.

Though the relationships should not be considered causal, they do tell us something about which merchandise categories are complementary or noncomplementary to one another. In this case, food, apparel stores, and automobile dealerships in a shopping center complement the sales of general merchandise stores. On the other hand, our estimation suggests that furniture and home appliance and drug stores are noncomplementary store types for general merchandise stores in a shopping center.

The complements for the other categories of stores are:

- For eating and drinking places—gasoline service stations and drug stores;
- For food stores—gasoline stations, building material, and drug stores;
- For general merchandise stores—food, apparel, furniture and home appliance, and drug stores
- For apparel stores—general merchandise, furniture and home appliance, and drug stores;
- For furniture and home appliance stores—apparel stores and gasoline stations;
- For automobile dealerships—gasoline service stations;
- For gasoline stations—eating and drinking places
- For drug stores—food, apparel, furniture and home appliance stores.

We leave it to the reader and future research to examine the complementary relationships between particular types of retail stores.

4. Summary

Three cases provide evidence supporting the importance of retail variety at shopping centers. Centers may be urban shopping centers, regional malls, or small rural downtowns. A consumer survey and surveys with retail business owners and managers provide direct evidence from the field. Additionally, a positive and significant relationship between variety and total retail sales exists, based on data from over 1,000 places in Ohio.

Taking the analysis one step further, we find that the variety of a center is directly related to the retail success all merchandise categories. We also show the complementary nature of various store types within retail centers. The limitations of our data prohibit a more specific and detailed analysis of these and other relationships.

The evidence tends to show that within the particular market niche of a given center, however, consumers will gravitate toward the center that provides them with a variety of store and merchandise opportunities.

Our analysis shows the need for further research on at least two issues. Both consumer and retail business surveys indicate the importance of variety to a successful retail center. We find that the variety of store types is important. Furthermore, we estimate complementary types of retail stores for retail centers. Further research on which merchandise categories complement each other would be valuable. A retail center manager or development practitioner, seeking to fill a vacant store, would benefit from knowing what type of stores complement one another.

Shopping center managers or economic development practitioners working with retail center development need to assess the market for a given center and strive to attract or retain businesses that increase the variety of the center. There are many challenges to discovering the niche of a given center. The evidence suggests, however, that within all market orders consumers prefer, and businesses benefit from, a diverse shopping center.

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