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AN EMPIRICAL ANALYSIS OF RETAIL CHAINS AND SHOPPING CENTER SIMILARITY IN CALGARY AND EDMONTON*

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I. INTRODUCTION

Economists and economic geographers have explored the size distribution and internal compositions of shopping centers both theoretically and empirically. Yet little has been done to explain the distribution of store ownership within shopping centers, among shopping centers in the same city, and among shopping centers in different cities. The purpose of this paper is to present and test with shopping center data from Calgary and Edmonton some hypotheses about store similarity in shopping centers.

Data on the internal compositions of planned community and regional centers in Edmonton and Calgary were collected in the summer and fall of 1987, respectively. Size was the main criterion in assigning a center to either the community or regional category, with the result that community centers contained from 20 to 65 stores, while regional centers had 82 to 511 stores. Table 1 contains descriptive statistics on the store compositions of malls and community centers in Edmonton and Calgary. There were nine malls in both

Table 2. C and M Stores in Edmonton and Calgary Malls and Community Centers

	Total	# of Independent Stores in Malls	% of Total	# of Independent Stores in Comm. Cetrs.	% of Total	# of Chain Stores in Malls	% of Total	# of Chain Stores in Comm. Ctrs	% of Total	# of Multichain Stores in Malls	% of Total	# of Multichain Stores in Comm Ctrs.	% of Total
C Stores													
Department Stores	48	0	(0)	3	(6)	37	(77)	8	(17)	25	(52)	9	(19)
Candy and Nut Stores	45	6	(13)	3	(7)	31	(69)	5	(11)	0	(0)	0	(0)
Men's & Boys' Clothing	119	27	(23)	5	(4)	79	(66)	8	(7)	73	(61)	4	(3)
Women's Clothing	589	62	(11)	50	(8)	439	(75)	38	(6)	390	(66)	24	(4)
Family Clothing	162	27	(17)	11	(7)	113	(70)	11	(7)	59	(36)	3	(2)
Shoe Stores	197	27	(14)	10	(5)	143	(73)	17	(9)	126	(64)	15	(8)
Women's Accessories	40	13	(33)	14	(35)	11	(28)	2	(5)	1	(3)	0	(0)
Children's Wear	34	5	(15)	7	(21)	18	(53)	4	(12)	8	(24)	3	(9)
Misc.Apparel / Accessory	69	15	(22)	11	(16)	32	(46)	11	(16)	15	(22)	0	(0)
China, Glass & Kitchenware	43	9	(21)	6	(14)	27	(63)	1	(2)	9	(21)	0	(0)
Radio and TV	58	4	(7)	3	(5)	38	(66)	13	(22)	0	(0)	0	(0)
Music Stores	64	9	(14)	9	(14)	40	(63)	6	(9)	8	(13)	4	(6)
Book Stores	54	1	(2)	8	(15)	35	(65)	10	(19)	22	(41)	2	(4)
Stationery and Card	57	8	(14)	5	(9)	30	(53)	14	(25)	6	(11)	2	(4)
Jewelry Stores	139	19	(14)	19	(14)	91	(65)	10	(7)	63	(45)	5	(4)
Hobby, Toy & Game	56	13	(23)	13	(23)	24	(43)	6	(11)	1	(2)	2	(4)
Gift, Novelty & Souvenir	124	35	(28)	20	(16)	57	(46)	12	(10)	12	(10)	0	(0)
M Stores													
Supermarkets	38	1	(3)	0	(0)	18	(47)	19	(50)	17	(45)	14	(37)
Coffee & Tea Stores	28	4	(14)	5	(18)	15	(54)	4	(14)	0	(0)	0	(0)
Meat, Fish & Deli	41	15	(37)	14	(34)	8	(20)	4	(10)	0	(0)	0	(0)
Retail Bakeries	50	9	(18)	8	(16)	26	(52)	7	(14)	15	(30)	2	(4)
Misc. Home Furnishings	29	7	(24)	8	(28)	12	(41)	2	(7)	0	(0)	0	(0)
Drug Stores	47	1	(2)	5	(11)	31	(66)	10	(21)	0	(0)	0	(0)
Sporting Goods	26	1	(4)	2	(8)	20	(77)	3	(12)	5	(19)	0	(0)
Camera Stores	30	1	(3)	1	(3)	19	(63)	9	(30)	10	(33)	3	(10)
Luggage and Leather	34	9	(26)	5	(15)	19	(56)	1	(3)	3	(9)	0	(0)
Sewing & Piece Goods	35	5	(14)	6	(17)	16	(46)	8	(23)	8	(23)	0	(0)
Florists	45	11	(24)	19	(42)	9	(20)	6	(13)	5	(11)	2	(4)
Cigar Stores	33	2	(6)	7	(21)	19	(58)	5	(15)	10	(30)	3	(9)
Art Dealers & Framers	35	12	(34)	15	(43)	8	(23)	0	(0)	0	(0)	0	(0)
Office Supply	22	1	(5)	1	(5)	19	(86)	1	(5)	0	(0)	0	(0)
Cosmetics	41	4	(10)	8	(20)	26	(63)	3	(7)	0	(0)	0	(0)
Dry Cleaning	54	4	(7)	16	(30)	19	(35)	15	(28)	0	(0)	0	(0)
Beauty Shops	73	27	(37)	32	(44)	9	(12)	5	(7)	2	(3)	0	(0)
Barber Shops	42	15	(36)	15	(36)	5	(12)	7	(17)	1	(2)	1	(2)
Photofinishing	47	4	(9)	12	(26)	24	(51)	7	(15)	2	(4)	0	(0)
Travel Agencies	56	8	(14)	14	(25)	18	(32)	16	(29)	0	(0)	0	(0)
Eye Glass Stores	53	16	(30)	13	(25)	17	(32)	7	(13)	4	(8)	1	(2)

IV. RESULTS

In order to test Hypotheses 1 to 3, a measure of similarity of store names located in different shopping centers is required. The following measure is used:

$$Sij = \frac{\text{number of store names in center i that are present in center j}}{\text{average number of stores in i and j}}$$

Clearly, Sij is bounded between 0 and 1.

Hypotheses 1 to 3 require comparison of the Sij computed for one set of centers with the Sij for a second set of centers. All three hypotheses are tested for malls in Edmonton and Calgary. Hypothesis 1 held that malls in different cities will tend to be more similar in terms of brands of C stores than in brands of M stores. For C stores, the average Sij is almost the same regardless of whether one looks at similarity of malls in the same city or between cities. This is not true of M stores, since the average Sij for malls in the same city is almost 20% higher than the Sij for malls in different cities. A formal statistical test shows that the data are consistent with Hypothesis 1.

Hypothesis 2 held that malls owned by the same firm will be more similar than malls owned by different firms. It was also anticipated that the hypothesis would hold particularly for C stores to the extent that firms own malls in different cities. There are 4 firms that own more than one mall in Edmonton and Calgary, and this results in 20 Sij computed for malls owned by the same firm. The average Sij computed over C stores is approximately 20% greater for malls owned by the same firm than for malls owned by different firms, but the average Sij computed over M stores is only about 12% greater for malls owned by the same firm than for malls owned by different firms. Results of a statistical test support Hypothesis 2.

Hypothesis 3 is that neighboring malls will have greater similarity in terms of firm ownership of M stores than non-neighboring malls. The test results of Hypothesis 3 do not reveal any strong evidence of preemption of neighboring centers by M stores taken as a group or by C stores taken as a group. There might still be evidence of preemption within a center by multichain firms, particularly those that operate C stores. Thus, Hypothesis 4 tests whether in malls the proportions of multichain M stores will be less than the proportions of multichain C stores. Whether the greater presence of C stores in malls results in a stronger multichain presence in malls than in community centers is also examined. There are 17 store types classified as C stores and 21 store types classifed M. Given that, on average, 35.6% of C stores in malls are multichain, while only 13.7% of M stores in malls are multichain, Hypothesis 4 finds support as expected. Test results also show that there is a stronger multichain presence for C stores in malls than in community centers.

Finally, Hypothesis 5 held that malls will be more similar in C store content for C store types mainly represented by multichain firms. To test this hypothesis, C store types are divided into two groups: those that have an average (over malls) proportion of multichain stores greater than .5 and those that do not. The former group includes department stores, men's clothing stores, women's clothing stores, family clothing stores, shoe stores, book stores, and jewelry stores. Next, the Sij are calculated over each group of C stores for Edmonton and Calgary malls separately. Test results show that Hypothesis 5 is supported by the data.

V. CONCLUSION

This report formulated some hypotheses about store similarity in shopping centers. They are tested using shopping center data from Calgary and Edmonton. Empirical support is obtained for the efficiency-based hypotheses, suggesting that further theoretical and empirical investigation into efficiency explanations for shopping center similarity would be fruitful. In particular, explanations that assume distribution and transactional economies need to be formalized. Tests using a larger, more geographically dispersed set of shopping centers should also be carried out.

The results for the preemption-based hypotheses are mixed. Strong evidence for broadly-based spatial preemption of store sites in neighboring shopping centers was not found. The implication is that tests for spatial preemption should be done one store type at a time and look at the timing of entry and exit of given stores of a type over a long period. Tests for preemption of a given store type within a center by multichain firms produced more positive results. There are firms that pursue brand proliferation strategies in malls, particularly in those store types replicated in malls due to comparison shopping behavior by consumers. Of interest is the fact that preemption of a replicated store type by a single firm is far from perfect. Future theoretical work might try to explain whether the conflicting interests of shopping center owners and chain-store firms are responsible for the imperfect preemption results.

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