IMPORTS AND RETAILERS IN CANADA: DOES SIZE MATTER?

by

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Abstract

This project investigates empirically whether retailer size influences their direct importing

activities. Twenty three Canadian retail sectors are analyzed, classified by types of

commodities for the year 2002. Two aspects of retailer size are considered, average

(employment) size and (employment) size dispersion of retail establishments in a retail sector.

Other explanatory factors include: the share of purchases of imports by wholesalers selling

the same product category of each retailer type; Canadian production of the commodities

sold in each retail sector, as a fraction of total Canadian production of the year; and three

importing sources (the US and Mexico, EU and Japan and Low Cost Asian countries). Due to

the high correlation between average employment size and employment size dispersion and

high correlation between wholesaling import and Canadian production, only non-highly

correlated independent variables are included in each estimation. The best estimation

suggests that there is significant negative correlation between average size of retail

establishments and their direct import activities; and there is negative link between size

dispersion of retail establishments and their direct import activities.

Acknowledgements

Chapter 1

Introduction

The growth of the retail sector in most countries along with simultaneous growth in the number of retailers who are involved in direct importing over the past fifty years has drawn attention to the implications of trade liberalization on retail market structure. For example, Raff and Schmitt (2008) investigate the effect of trade liberalization on the link between retailer's size and direct import activities. Two of their findings are that the retailers involved in direct import activities are larger and that trade liberalization will increase both their average size and levels of imports as well as the number of retailers that import. The reason they believe there is a link between retailers' direct import activities and retail market structure is that only big retailers are able to engage in direct importing. Unlike small retailers, they are able to cover the fixed cost associated with direct importing. Small retailers who are unable to cover these fixed costs sell domestic products only. In such an environment trade liberalization helps the large retailers import more and penalizes the small retailers that are unable to take advantage of trade liberalization. This leads to a retail sector that is not only more competitive but also one in which large retailers have a greater share of the overall market.

In this project, we investigate empirically the link between retailers' direct import activities and retail market structure by examining twenty three retail sectors in Canada for 2002. Specifically we look into whether direct import activities are greater in a retail segment where retailers are typically bigger; and whether there is a link between the size dispersion of retail establishments and their direct importing. Size dispersion is interesting because it tells us something about the degree of heterogeneity among retailers. Our investigation is similar to the one analyzed empirically by Campbell and Hopenhayn (2005) who investigate whether retailers are larger in larger metropolitan markets in the US. They find that they are but that the effect of market size on size dispersion of retailers is ambiguous. More details about their work and how we set up our model based on their model is provided in Section III.

Our investigation is important for at least two reasons. If it is true that there is positive link between retailers' size and their direct imports, then the growth of large retailers through direct import can cause an increase in competition in retailer markets and tend to force small retailers to exit the market. Consumers may then have a smaller choice among retailers where to shop. In some countries this is considered sufficiently harmful so as to place restrictions on the expansion of large retailers. Our investigation is also important to understand the role or retailers in the response of domestic price with respect to foreign price shocks (pass-through rate). Retailers play a key role, especially of course when they import. This imples that the structure of the retailing industry has an impact on this process (Raff and Schmitt, 2008).

The remainder of the project is organized as follows. The next section presents some facts about the link between direct importing activities of retailers and the size distribution of retail

establishments in Canada. Section III gives a short review of why retailers' import activities

might be linked to their size. Section IV provides an empirical analysis concerning the

Canadian case, and section V concludes.

Chapter 2

The Facts

The purpose of this section is to examine whether the plots of our data of twenty three

Canadian retail segments exhibit a link between direct importing activities of retailers and

their size distribution. Because data of average size and size dispersion of retailers is not

available, in Section 2.1 we develop measures of them first from our data to obtain that

information. In Section 2.2, we present data of direct imports of retailers. In Section 2.3 we

plot retailers' direct imports against their average size and their size dispersion. In Section

2.3 we also present the share of purchases of imports by wholesalers selling the same product

category of each retailer type.

2.1 Size Distribution

Table 1 provides establishment counts per employment size of all retail sectors as provided

by Statistics Canada (Canadian Business Patterns, December 2002). It is the data from which

we are going to develop ways of measuring retailers' size distribution. The first column lists

twenty three Canadian retail sectors classified by type of commodity base on the North

America Industrial Classification System at the four digit level. The second column provides the count of establishments in each sector. It can be seen that Grocery Stores, Clothing Stores and Health and Personal Care Stores are the top three sectors in terms of total establishment count; and that Vending Machine Operators, Electronic Shopping and Mail-Order Houses and Department Stores have the lowest total establishment count. Columns 3 to 10 provide the count of establishments whose employment belongs to the employment class shown in the top cell. The smallest employment as provided in column 3 is less than 5 employees. The largest employment class as provided in column 10 is no less than 500 employers. Department Stores, which have fewer establishments than most of the other segments, have the highest count of very large retailers who hire more than 200 workers. In the Automobile Dealers, Automotive Parts, Accessories and Tire Stores and Florists sectors there are barely any establishment that hires more than 200 workers.

There are many ways to measure the size of a retail establishment, such as sales and area. In this project, we consider employment size as the way of measuring size in the sense that a retail establishment who hires more workers is bigger. We develop ways of measuring average employment size and employment size dispersion to measure average size and size dispersion of a retail segment.

We develop the measure of average size in the following way. Since the data in Table 1 does not tell us anything about the amount of employment of each retail establishment within an employment class, we use the median employment size of each employment class to describe the average employment size of all the establishments that belong to the class. However, we cannot get the average size of establishment of a retail sector by simply adding up every

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Table 1 Counts of Retail Establishment for 2002

Retail Sector	Total	1 to 4	5 to 9	10 to 19	20 to 49	50 to 99	100 to 199	200 to 499	500+
4411 - Automobile Dealers	6750	2508	817	1060	1349	711	260	42	3
4412 - Other Motor Vehicle Dealers	2143	984	503	397	206	44	9	0	0
4413 - Automotive Parts, Accessories and Tire Stores	3472	1345	1054	716	309	41	7	0	0
4421 - Furniture Stores	2912	1208	651	548	354	99	35	15	2
4422 - Home Furnishings Stores	3959	2124	900	610	250	48	20	7	0
4431 - Electronics and Appliance Stores	7866	4238	2001	1000	498	88	24	14	3
4441 - Building Material and Supplies Dealers	6030	2343	1425	1114	782	179	61	125	1
4442 - Lawn and Garden Equipment and Supplies Stores	1188	563	223	217	141	35	7	0	2
4451 - Grocery Stores	16341	7581	3044	1976	1533	1246	787	154	20
4452 - Specialty Food Stores	5696	2801	1374	894	488	104	31	2	2
4461 - Health and Personal Care Stores	10998	3226	3157	2175	1834	504	91	9	2
4471 - Gasoline Stations	10817	4122	3348	2506	751	64	19	6	1
4481 - Clothing Stores	13661	4742	4403	3074	1046	265	79	39	13
4482 - Shoe Stores	2019	591	889	350	114	33	23	16	3
4483 - Jewellery, Luggage and Leather Goods Stores	3180	1632	995	351	163	24	10	5	0
4511 - Sporting Goods, Hobby and Musical Instrument Stores	6108	3035	1374	1119	449	83	26	15	7
4512 - Book, Periodical and Music Stores	2116	1006	616	327	134	19	6	6	2
4521 - Department Stores	766	2	10	2	50	178	267	230	27
4529 - Other General Merchandise Stores	5349	2651	1118	679	373	270	191	60	7
4531 - Florists	2643	1861	473	223	74	11	0	1	0
4532 - Office Supplies, Stationery and Gift Stores	5223	3187	1007	513	429	56	24	5	2
4533 - Used Merchandise Stores	1911	1351	282	164	82	19	6	5	2
4539 - Other Miscellaneous Store Retailers	5525	3409	1054	626	349	56	25	5	1
4541 - Electronic Shopping and Mail-Order Houses	697	365	118	83	64	29	25	9	4
4542 - Vending Machine Operators	649	362	111	76	76	15	7	0	2

Table 1 provides the total number of establishments per retail sector as well as the breakdown according to eight classes of employment size of establishment (1-4 employees, etc...) it shows that most establishments in retail are small.

median because the establishment count varies with employment class. The median of an employment class which has a lot of establishments should contribute more to the overall average size than does the median of one in which there are only a few establishments. Thus we weight each median by the proportion of the establishments that belong to the class and then add the weighted medians together to measure the overall average size.

To measure employment size dispersion, we use the Gini coefficient which is commonly used as a measure of income inequalities. When the Gini index is used to measure income inequalities, it can be calculated as

$$G = 1 - \sum_{k=1}^{n}(x_k - x_{k-1})(y_k + y_{k-1}),$$

where x_k is the cumulated proportion of the population variable, for $k = 0,...,n$, with $x_0 = 0$ and $x_n = 1$; and y_k is the cumulated proportion of the income variable, for $k = 0,...,n$, with $y_0 = 0$ and $y_n = 1$. In our case, we treat establishment counts as population and employment size as income. The establishments in each retail segment are classified into eight groups according to their employment sizes. For any retail sector with the total establishment count and the count of establishment in each employment class, we are able to get the cumulative frequencies of establishment. To get the other set of cumulative frequencies which are for employment sizes, we need to know the total amount of employment in the retail segment. It can be approximated by multiplying the average employment size of the retail sector with the total establishment count. The amount of employment in each group can be obtained by multiplying the median employment size with the establishment count. Then we are able to get the cumulative proportions of employment size. A more detailed calculation is provided in Appendix 2.

Table 2 Distribution of Size of Retail Establishments

Retail Sector	Average employment size	Gini-index
4411 - Automobile Dealers	27.00	0.639504
4412 - Other Motor Vehicle Dealers	10.95	0.55831
4413 - Automotive Parts, Accessories and Tire Stores	10.34	0.50417
4421 - Furniture Stores	16.07	0.64140
4422 - Home Furnishings Stores	9.62	0.58029
4431 - Electronics and Appliance Stores	9.30	0.57841
4441 - Building Material and Supplies Dealers	20.85	0.69926
4442 - Lawn and Garden Equipment and Supplies Stores	13.33	0.61361
4451 - Grocery Stores	24.36	0.72209
4452 - Specialty Food Stores	10.66	0.58089
4461 - Health and Personal Care Stores	16.41	0.56243
4471 - Gasoline Stations	9.83	0.48444
4481 - Clothing Stores	12.91	0.57354
4482 - Shoe Stores	14.86	0.62532
4483 - Jewellery, Luggage and Leather Goods Stores	8.42	0.53917
4511 - Sporting Goods, Hobby and Musical Instrument Stores	11.20	0.60500
4512 - Book, Periodical and Music Stores	10.30	0.58383
4521 - Department Stores	197.90	0.36819
4529 - Other General Merchandise Stores	20.75	0.73677
4531 - Florists	5.64	0.46525
4532 - Office Supplies, Stationery and Gift Stores	9.18	0.59880
4533 - Used Merchandise Stores	8.28	0.62139
4539 - Other Miscellaneous Store Retailers	8.56	0.58228
4541 - Electronic Shopping and Mail-Order Houses	23.81	0.76457
4542 - Vending Machine Operators	13.51	0.66848
4543 - Direct Selling Establishments	11.20	0.64877

Table 2 shows average size and size dispersion for all the retail sectors. It can be seen that

Department stores has the lowest dispersion. As shown in Table 1, Department Stores have a

small total number of establishments and many large establishments. Average size exhibits a

of lot variation among retail sectors. The average size of Department Stores is the highest,

more than 600% higher than the second highest average size. The correlation between dispersion and average size is -0.44. This negative correlation suggests that in a retail sector in which average size is high, establishments are more concentrated toward being large in size, and thus featured with low size dispersion.

2.2 Direct Imports of Retailers

Table 3 provides direct imports of retailers in each retail segment. Column 2 is the count of retail establishments involved in direct import as a proportion of the total amount of establishments. A retail establishment is counted into the proportion as long as it has direct imports, no matter how many direct imports it has. Columns 3 to 5 report the proportion of retail establishments that have direct imports from the US and Mexico, EU and Japan and Low Cost Asian countries respectively[1]. Due to confidentiality issues, Health and Personal Care Stores, Department Stores and Other General Merchandise Stores in Table 1 are not available in Table 3. We rank the proportion of establishments that import from all countries as well as from different sources in Table 4. Ranking is very similar between importing from all foreign countries and from the US and Mexico except for Shoe Stores and Automotive Parts, Accessories and Tire Stores. This is of course mainly due to the fact that the US and Mexico are the largest source of imports. When it comes to Shoe Stores, retailers import most frequently from EU and Japan, while the US and Mexico are much less important sources. Other Motor Vehicle Dealers, Furniture Stores and Sporting Goods, Hobby and Musical Instrument Stores are ranked the top three for the highest proportion of importing

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[1] The Low Cost Asian countries include: China, India, Indonesia, Malaysia, Thailand and Philippines.

retailers. These are also the biggest three importers from the US and Mexico. Florist, Grocery Stores and Gasoline Stations are the smallest importers both with respect to total sources and the US and Mexico. Rankings of small importers are fairly consistent across sources. The five smallest importers with respect to total sources, which are Direct Selling Establishments, Specialty Food Stores, Florists, Grocery Stores and Gasoline Stations, are also the five smallest retail importers from the separate sources.

Table 3 Proportion of Establishments that Import

Retail Sector	Total countries (%)	The US and Mexico (%)	Low Cost Asian Countries (%)	EU and Japan (%)
4411 - Automobile Dealers	11.20	-	-	-
4412 - Other Motor Vehicle Dealers	31.00	29.60	6.20	6.00
4413 - Automotive Parts, Accessories and Tire Stores	12.70	11.00	2.90	4.30
4421 - Furniture Stores	23.60	19.70	14.40	8.60
4422 - Home Furnishings Stores	16.30	12.00	6.90	5.80
4431 - Electronics and Appliance Stores	12.10	10.00	3.30	3.50
4441 - Building Material and Supplies Dealers	9.60	8.30	2.30	2.90
4442 - Lawn and Garden Equipment and Supplies Stores	16.60	14.80	4.30	5.60
4451 - Grocery Stores	1.80	1.20	0.60	0.40
4452 - Specialty Food Stores	5.70	3.60	1.50	1.80
4471 - Gasoline Stations	1.60	1.30	0.30	0.30
4481 - Clothing Stores	13.20	7.80	5.70	4.80
4482 - Shoe Stores	14.40	8.10	5.60	8.80
4483 - Jewellery, Luggage and Leather Goods Stores	16.10	10.00	7.10	6.10
4511 - Sporting Goods, Hobby and Musical Instrument Stores	21.80	18.40	9.10	8.10
4512 - Book, Periodical and Music Stores	13.20	10.60	2.60	4.30
4531 - Florists	3.70	2.60	1.10	1.20
4532 - Office Supplies, Stationery and Gift Stores	13.40	9.10	7.10	4.40
4533 - Used Merchandise Stores	11.70	8.00	3.40	4.50
4539 - Other Miscellaneous Store Retailers	12.50	10.00	4.10	3.80
4541 - Electronic Shopping and Mail-Order Houses	17.40	13.10	6.30	6.90
4543 - Direct Selling Establishments	5.90	4.50	1.70	1.60
4542 - Vending Machine Operators	5.80	-	-	-

Sources: Statistics Canada, Importer Register, 2002

Table 4 Ranking of Proportion of the Establishments That Import

Retail Sector	Total countries	The US and Mexico	Low Cost Asian Countries	EU and Japan
4412 - Other Motor Vehicle Dealers	1	1	7	6
4421 - Furniture Stores	2	2	1	2
4511 - Sporting Goods, Hobby and Musical Instrument Stores	3	3	2	3
4541 - Electronic Shopping and Mail-Order Houses	4	5	6	4
4442 - Lawn and Garden Equipment and Supplies Stores	5	4	10	8
4422 - Home Furnishings Stores	6	6	5	7
4483 - Jewellery, Luggage and Leather Goods Stores	7	9	3	5
4482 - Shoe Stores	8	14	9	1
4532 - Office Supplies, Stationery and Gift Stores	9	12	4	11
4512 - Book, Periodical and Music Stores	10	8	15	13
4481 - Clothing Stores	11	16	8	9
4413 - Automotive Parts, Accessories and Tire Stores	12	7	14	12
4539 - Other Miscellaneous Store Retailers	13	10	11	14
4431 - Electronics and Appliance Stores	14	11	13	15
4533 - Used Merchandise Stores	15	15	12	10
4411 - Automobile Dealers	16	-	-	-
4441 - Building Material and Supplies Dealers	17	13	16	16
4543 - Direct Selling Establishments	18	17	17	18
4542 - Vending Machine Operators	19	-	-	-
4452 - Specialty Food Stores	20	18	18	17
4531 - Florists	21	19	19	19
4451 - Grocery Stores	22	21	20	20
4471 - Gasoline Stations	23	20	21	21

2.3 Correlation between Retail Import and Retailer Size Distribution

In this section, we plot retailers' direct import against their average size and size dispersion. We draw two sets of graphs. One set has the share of retail establishments that import on the vertical axis and average employment size on the horizontal axis. The other set has the share of establishments that import on the vertical axis and size dispersion on the horizontal axis.

Observations of some retail sectors may not reflect the true levels of direct imports because some retailers do not typically import goods directly from foreign manufactures but from domestic wholesalers who sell them imported goods. However, there is not a prior direction of link between the behaviour of wholesalers and retailers concerning imports. On one hand, imports of wholesalers provide a domestic source to retailers to buy foreign goods. From this perspective, wholesalers' imports are expected to have a negative effect on retailers' direct import activities. On the other hand, it may reflect the fact that heavily imported goods by wholesalers concern goods whose production in Canada is small or nonexistent. These goods are also those which retailers may want to import directly. From this perspective, wholesalers' imports may be positively related with retailers' direct import activities.

Because of these possibilities, we first simplify the issue by eliminating some of the retail sectors to draw the graphs. One important retail sector of this type is Automobile Dealers. Most motor vehicles sold in Canada are imported. According to Hays (2005), only five of the major automobile manufacturers have plants in Canada, and only for certain makes and models. In 2003, only 29 models out of the approximately 266 different models of passenger and light trucks sold in Canada were manufactured in Canada. On average, almost six out of every ten cars sold in Canada are produced from foreign manufacturers and imported into

Canada. These imports would mostly go to the wholesalers before going to the retailers. Wholesalers have a close affiliation with these foreign manufacturers. Nearly two-thirds of wholesalers of motor vehicles, parts and accessories are controlled by a manufacturing parent. The close connection between manufacturers and wholesalers could be the reason why retailers mostly buy motor vehicles from wholesalers rather than manufacturers. Therefore, the data we have of imports by motor vehicles retailers is likely to be a small proportion of the total imports they sell. Another sector falling into this category is Grocery. Three out of 10 wholesalers in this sector are controlled by a retail parent. In many cases this is by a major national grocery chain in which the wholesaler supplies the corporate or franchise stores. As a result, about 57% of wholesale sales for food, beverage and tobacco were directed to retailers. Wholesale sales to retailers alone rose 31% between 1998 and 2003 (Hays 2005).

In addition, we also drop Electronic Shopping and Mail-Order Houses, Vending Machine Operators and Direct Selling Establishments which are non-store retailers as opposed to all the other store retailers.

Figures 1 to 4 plot the fraction of retailers with direct imports against average size. In Figure 1, the proportion of retail establishments that directly import from any country is plotted against average size. The correlation between the two variables is 0.3383. Figures 2 to 4 are the plots of the proportion of retail establishments that import for different sources (the US and Mexico, EU and Japan and Low Cost Asian countries) against average size. The correlation coefficients are 0.3373, 0.3959 and 0.2540 respectively. They suggest there is positive correlation between average retail establishment size and the proportion of retail establishments that import from any source and from separate sources. Figures 5 to 8 are the

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plots the proportion of establishments that import against employment size dispersion. The correlation coefficients are 0.5221, 0.4986, 0.5221 and 0.3980. These results suggest that there is a positive link between direct import by retailers and size dispersion. However, this result is contradictory to the result section 2.1 where average size and size dispersion are negatively correlated. The contradiction may be caused by the small sample in which there are less than twenty observations.

Figure 1 Average Retail Size and Share of Importing Retail Establishment
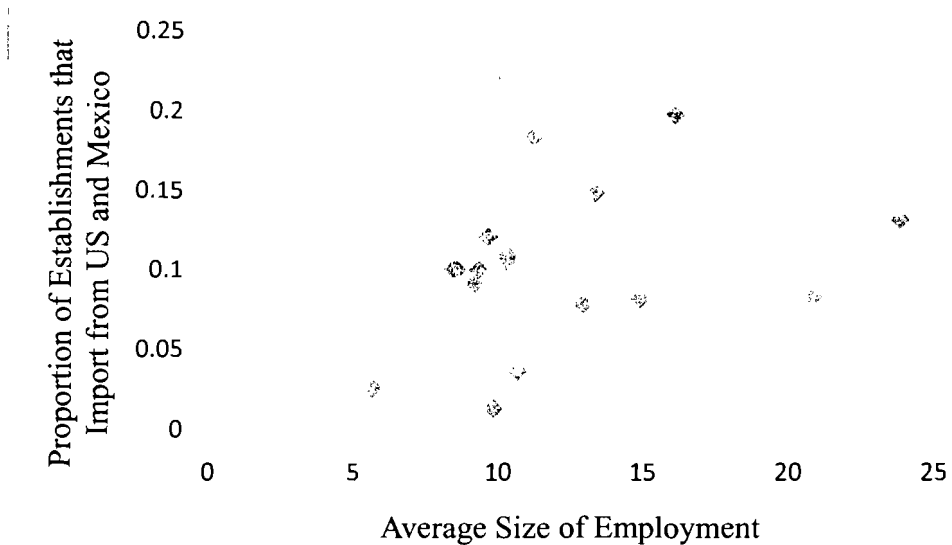
Figure 2 Average Retail Size and Share of Retail Establishment that Import from the US and Mexico
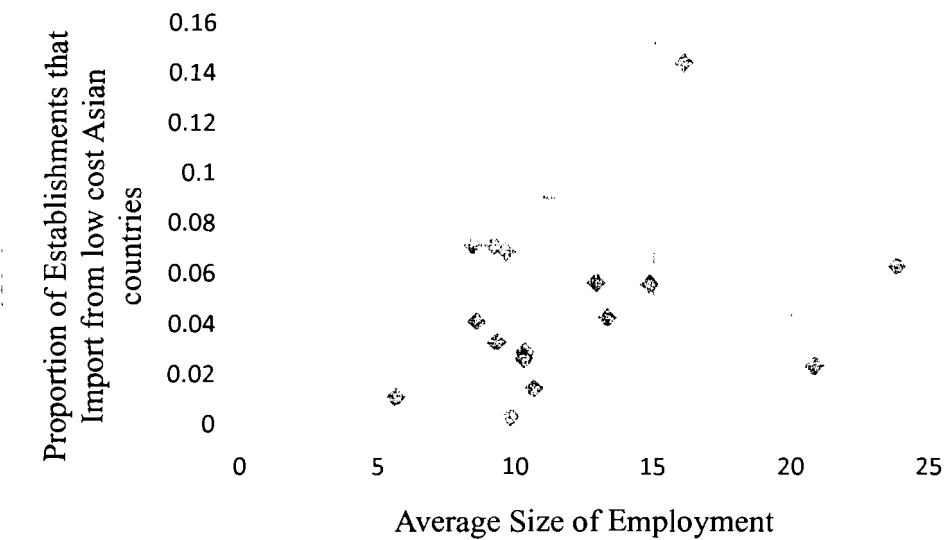
Figure 3 Average Retail Size and Share of Retail Establishments that Import from Low Cost Asian Countries

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Figure 4 Average Retail Size and Share of Establishment that Import from EU25 and Japan
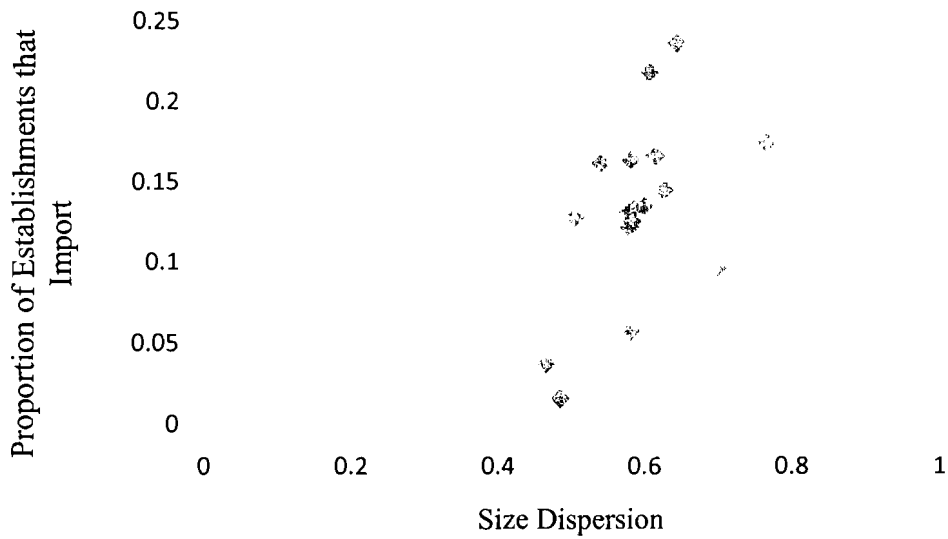
Figure 5 Dispersion of Retail Size and Share of Importing Establishment

Figure 6 Dispersion of Retail Size and Share of Establishment that Import from the US and Mexico
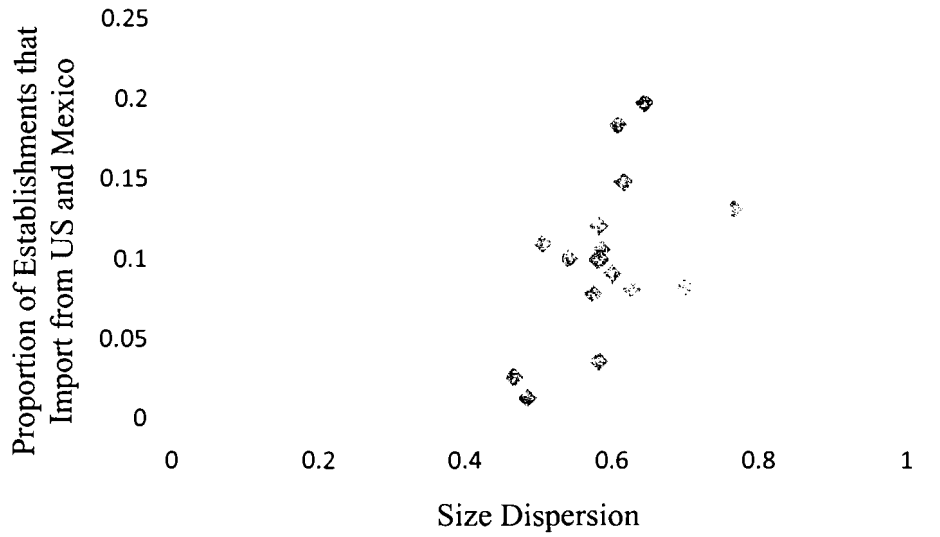

Figure 7 Dispersion of Retail Size and Share of Establishment that Import from Low Cost Asian countries
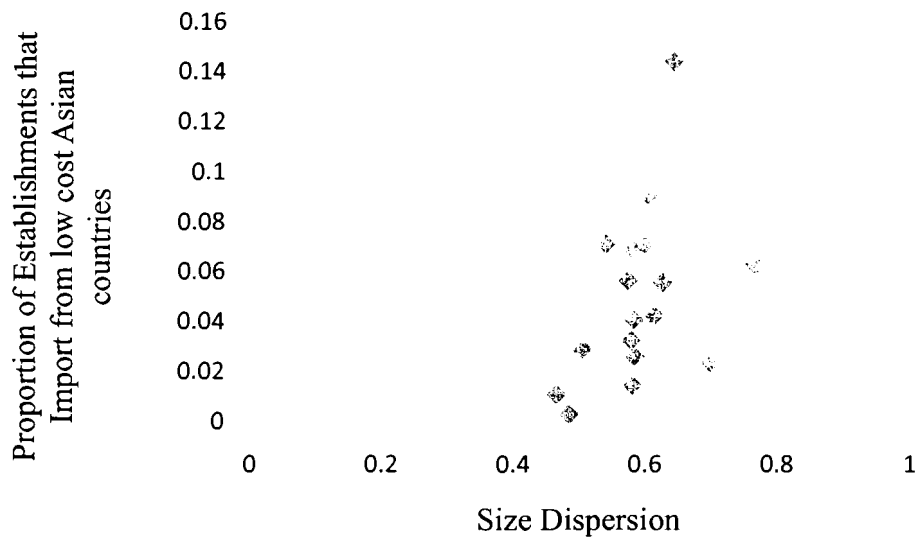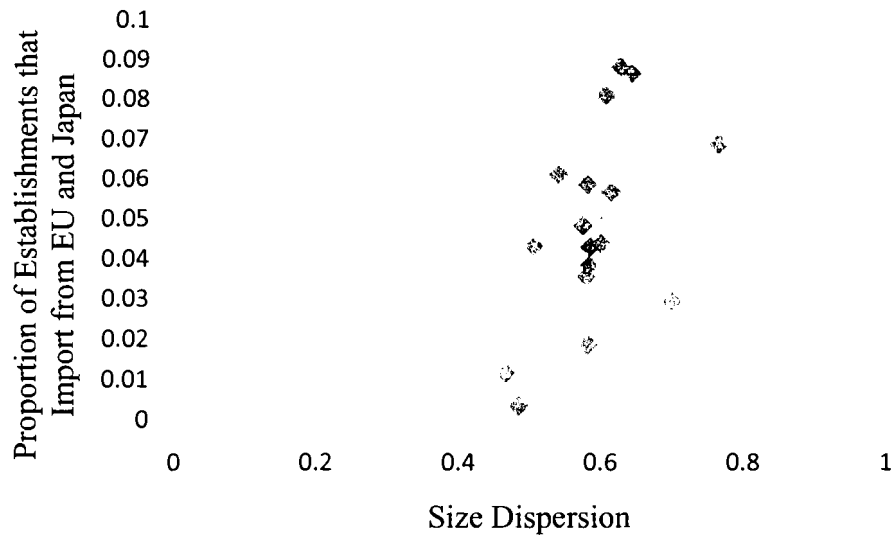
Figure 8 Dispersion of Retail Size and Share of Establishment that Import from EU25 and Japan

In the empirical section, we take into account all the sectors by taking into account the role of imports by wholesalers. Data of share of purchases from imports by the wholesalers corresponding to each retail sector is presented in Table 5. We average the data from 1998 to 2001, and use this as the information of wholesaling import for 2002. It can be seen that among the 19 sectors, 13 wholesaling sectors have high import purchases ratio (more than 50%). Apparel wholesalers, corresponding to Clothing Stores, are the biggest importers with 68.4% of total purchases coming from selling imported goods. Motor Vehicle wholesalers corresponding to Automobile Dealers and Other Motor Vehicle Dealers are the second biggest imports. Low importing wholesalers with import purchases ratio less than 20% include Food Products wholesalers which correspond to Grocery Stores and Food Speciality Stores and Farm Products wholesalers which correspond to Florist Dealers. Imports by the latter only account for 5.8% of total purchases. The correlation between retail import and wholesaling imports is 0.69, which suggests a positive link between imports by wholesalers and by retailers.

Table 5 Wholesale Imports, 1998-2001 Average

Retail Sector	Wholesaling Sector	Share of Purchases from Imports
4411 - Automobile Dealers	Motor vehicles	58.4%
4412 - Other Motor Vehicle Dealers	Motor vehicles	58.4%
4413 - Automotive Parts, Accessories and Tire Stores	Motor vehicle parts and accessories	44.3%
4421 - Furniture Stores	Home and personal products	56.5%
4422 - Home Furnishings Stores	Home and personal products	56.5%
4431 - Electronics and Appliance Stores	Home and personal products/Machinery, Equipment and Supplies [417]	55.7%
4441 - Building Material and Supplies Dealers	Building Materials and Supplies [416]	26.1%
4442 - Lawn and Garden Equipment and Supplies Stores	Machinery, Equipment and Supplies [417]	54.9%
4451 - Grocery Stores	Food products	19.4%
4452 - Specialty Food Stores	Food products	19.4%
4471 - Gasoline Stations	-	-
4481 - Clothing Stores	Apparel	68.4%
4482 - Shoe Stores	Home and personal products	56.5%
4483 - Jewellery, Luggage and Leather Goods Stores	Home and personal products	56.5%
4511 - Sporting Goods, Hobby and Musical Instrument Stores	Home and personal products	56.5%
4512 - Book, Periodical and Music Stores	Home and personal products	56.5%
4531 – Florists	Farm Products (minus grain) [411]	5.8%
4532 - Office Supplies, Stationery and Gift Stores	Machinery, Equipment and Supplies [417]	54.9%
4533 - Used Merchandise Stores	-	-
4539 - Other Miscellaneous Store Retailers	Miscellaneous [418]	29.4%
4541 - Electronic Shopping and Mail-Order Houses	-	-
4543 - Direct Selling Establishments	-	-
4542 - Vending Machine Operators	-	-

Source: Statistics Canada, special tabulation, Wholesale Trade Commodity Survey by Origin and Destination, 1998 and 2001.

Chapter 3

Theory

In this section, we set up our model based on the empirical investigation done by Campbell and Hopenhayn (2005). These authors base their analysis of the effects of market size on retailers' size on oligopoly theory which predicts that larger markets are more competitive and have lower markups. Because producers in more competitive markets must recover their fixed cost by selling more at a lower markup, they predict that retailers are larger in larger retail markets if oligopoly theory applies to large-group competitors. They show that this is indeed the case for the US metropolitan retail markets. They also look at the link between market size and size dispersion of retail establishments and find ambiguous results.

The same analysis can be extended to the buying side of retailers. If it is true that importing involves fixed cost, then one could expect that large retailers import more than smaller ones to recover their fixed cost. The case of dispersion in this case is less clear cut. Thus we ask two questions with respect to the buying side of retailers: First, do larger retailers import more? Second, do sectors with dispersed retail establishments import more or do they import less?

The model is set up as follows,

$$IMP = f(C, X, D),$$

where the dependent variable, IMP, is the proportion of retail establishments that import directly per sector, C is a constant, X is a vector of independent variables, and D is a vector of dummy variables.

We assume that the vector X is composed of three variables: the average size of retailers per sector, AVE, the import share of the wholesalers per sector, IMPW, and the fraction of the Canadian production concerning the goods sold by each sector out of total Canadian production, M. M and IMPW may provide the same information. If M is low, Canada does not have a comparative advantage in this sector. Hence imports by wholesalers are likely to be high. We also set three dummy variables capturing different origins of imports: the NAFTA dummy (NAFTA=1 if the imports are from the US or Mexico, NAFTA = 0 otherwise); the Asia dummy (ASIA = 1 if the imports are from Low Cost Asian countries, Asia = 0 otherwise) and the EU dummy (EU = 1 if the imports are from the EU or Japan; EU = 0 otherwise). For the observations with all the three dummies equal to zero, the dependent variable IMP is the proportion of establishment that has direct import regardless of importing sources.

We expect a positive sign of AVE, a positive or a negative sign of IMPW depending if wholesale imports are complements or substitutes with respect to retailers' imports, a negative sign of M since domestic production and imports should be substitute. The expected signs of the dummy variables are not entirely clear. Free trade between Canada and the US/Mexico may imply that the size of Canadian retailers might not matter much with respect

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to direct import from NAFTA countries. We might expect that retailers' size matters more concerning imports from Low Cost Asian countries and expect a positive sign be associated with the Asia dummy. The same may be true concerning the EU dummy. However, products might be more specialized and differentiated too and thus not necessarily associated with retailers' average size.

Chapter 4

Estimations

In this section estimation results are reported. Table 6 shows a statistics summary of all the variables. Data for estimation includes information of 15 retail sectors while the number of our observations is 60. This is because each retail segment is used as an observation for four times: one has IMP as the share of establishment that import; and each of the other three has IMP as the share of establishment that import from one specific region (the US and Mexico, EU/Japan or Low Cost Asian countries). Mean proportion of establishments that have direct import, whether from any country in the world or from a certain region (the US and Mexico, EU and Japan or low coast Asian countries), of all the retail sectors is 9.18%. The highest proportion is 31% of Other Motor Vehicle Dealers who have direct imports. The lowest proportion is 0.4% which is the proportion of Grocery Stores that import from EU and Japan. The average amount of employment per establishment of all the retail sectors is around 13. The smallest average employment size per establishment is around 8 employees. These establishments are Luggage and Leather Goods Stores. The highest average employment size per establishment is around 24 employees. These establishments are Grocery Stores. The average GINI- coefficient of all the retail segments is 0.6. The average import purchases

ratio of the wholesaling segments is almost 50% and that the average ratio of Canadian

production of the products sold in a retail segment is around 4%.

Table 6 Summary Statistics of the Variables

Variable	Observation	Mean	Standard Deviation	Min	Max
IMP	60	0.0918	0.06707	0.004	0.31
AVE	60	12.8233	4.4430	8.42	24.36
GINI	60	0.6003	0.0547	0.5042	0.7221
IMPW	60	0.4937	0.1476	0.194	0.684
M	60	0.0404	0.0400	0.001	0.1318
NAFTA	60	0.25	0.4367	0	1
ASIA	60	0.25	0.4367	0	1
EU	60	0.25	0.4367	0	1

Table 7 Correlation Matrix of the Variables

	IMP	AVE	GINI	IMPW	M	NAFTA	ASIA	EU
IMP	1.0000							
AVE	-0.2249	1.0000						
GINI	-0.1973	0.8920	1.0000					
IMPW	0.4456	-0.5760	-0.5069	1.0000				
M	-0.2813	0.4824	0.3123	-0.8074	1.0000			
NAFTA	0.2114	-0.0000	0.0000	0.0000	-0.0000	1.0000		
ASIA	-0.3361	-0.0000	0.0000	0.0000	-0.0000	-0.3333	1.0000	
EU	-0.3604	-0.0000	0.0000	-0.0000	-0.0000	-0.3333	-0.3333	1.0000

The correlation matrix in Table 7 suggests that import sales ratio of wholesalers (IMPW) and

Canadian production (M) are indeed highly negatively correlated. The correlation between

them is -0.8028. This result implies that wholesalers make import decisions heavily based on

condition of Canadian production. Average size (AVE) and size dispersion (GINI) are also

highly correlated at a coefficient 0.8920. These essentially mean that information is the same between IMPW and M and between AVE and GINI. Hence, we simply use the variable that brings the most to the estimation.

We do estimations of retail direct import (IMP) against four different sets of independent variables. In each set, beside the three dummy variables in Table 7, we add another 14 dummies of which each indicates one retail segment to control the influence of repetition uses of each retail sector. Robust estimations are adopted to solve heterogeneity problems, if there is any. The results are reported in Table 8.

Column 2 of Table 8 shows the results of estimation in which average size (AVE), import purchases of wholesalers (IMPW) and the dummy variables[2]. The results, as shown in the second column of Table 8, suggest that both the coefficient of average size (AVE) and that of import purchases share of wholesalers (IMPW) are negative and insignificant; all the import source dummies have negative significant effects at the 1% or the 5% level. The value of R-squared suggests that all these independent variables together can explain more than 80 percent of the variations in the retail's imports (IMP).

Column 4 of Table 8 shows the results of the estimation in which import purchases of wholesalers (IMPW) is replaced with Canadian production (M). After the replacement, the coefficient of average size (AVE) becomes significant, as opposed to being insignificant in column 2, at the 15% level; the coefficient of Canadian Production (M) is negative but

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[2] Two of the dummies variables of which each indicates a retail sector are dropped due to a multicollinearity problem. The same is true to all the rest of the estimations.

insignificant; R-squared and coefficient estimations of other variables are the same as the results in column 2.

Table 8 Estimations Results with AVE[3]
(Dependent Variables)

	Coefficients t-statistics			
AVE	-0.0065 (-1.07)	-0.0090 (-1.11)	-0.0043* (-1.66)	-0.0070** (-2.40)
NAVE		0.0015 (0.86)		0.0015 (0.86)
AAVE		0.0043** (2.44)		0.0043** (2.44)
EAVE		0.0043** (2.43)		0.0043** (2.43)
IMPW	-0.0644 (-0.27)	-0.0644 (-0.21)		
M			-0.1071 (-0.27)	-0.1071 (-0.21)
NAFTA	-0.0315** (-2.66)	-0.0504* (-1.74)	-0.0315** (-2.66)	-0.0504* (-1.74)
ASIA	-0.0946*** (-8.37)	-0.1491*** (-5.18)	-0.0946*** (-8.37)	-0.1491*** (-5.18)
EU	-0.0974*** (-8.27)	-0.1526*** (-5.53)	-0.0974*** (-8.27)	-0.1526*** (-5.53)
Number of observations	60	60	60	60
R-squared	0.8306	0.8455	0.8306	0.8455

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[3] Retail segments dummies are not reported in the table but they are included in the estimations.

In column 3, three slope dummy variables are added to the regression in column 2. One slope dummy variable captures the influence of importing from the US and Mexico on the coefficient of average size of retail establishment (AVE), NAVE, which is the product of NAFTA and AVE. Another slope dummy variable captures the influence of importing from Low Cost Asian countries on coefficient of average size of retail establishment (AVE), AAVE, which is the product of ASIA and AVE. The last slope dummy, EAVE, is the product of AVE and the dummy EU. This captures the influence of importing from the EU and Japan on the coefficient of average size (AVE). The robust estimation shows that average size (AVE) and import purchases share of wholesalers (IMPW) are both insignificant, AAVE and EAVE are both significant at the 5% level; the coefficients of the corresponding constant dummies, ASIA and EU, both become larger in absolute value; NAVE turns out to be insignificant, and its corresponding constant dummy NAFTA becomes less significant; R-squared has improved slightly.

In column 5, we add the slope dummies to the estimation in column 3. As a result, coefficient of AVE becomes more negative and more significant (at the 5% level); IMPW is still insignificant; the slope dummies turn out to have positive effects on IMP, and two of them (AAVE and EAVE) are significant; NAFTA becomes less significant while ASIA and EU become more influential;. R-squared has improved.

In summary, the slope dummies are significant and improve R-squared. Therefore we suggest that they should be included in the estimations. Of the two estimations with slope dummy variables, the one with wholesale import (IMPW), as shown in column 3 of Table 8 does not suggest a significant link between average size (AVE) and retailers' direct imports (IMP); although the other estimation, as shown in column 5, suggests that average size (AVE)

does have significant effect on retailers' direct imports (IMP), the negative sign of the estimated coefficient is opposite to our expectation.

We also do the similar estimations against size dispersion (GINI). The results are reported in Table 10, Appendix 3. The estimations in the last two columns both suggest a significant link between that size dispersion (GINI) and retail import (IMP), while those in the first two columns do not suggest any significant link between the two. The estimations also suggest that size dispersion of retail establishment (GINI) has a negative effect on retailers' direct imports (IMP); Canadian production (M) has a negative significant effect.

Thus, the main findings of this section are that both retailers' average size and retailers' size dispersion have significant negative influence on their direct import activites.

Chapter 5

Conclusion

The main purpose of the project is to investigate empirically whether, in the Canadian retail industry, large retailers import more than smaller ones. Our findings imply that retailers' direct imports are less in a retail sector with higher average size or in a retail sector that exhibits higher size dispersion. Small retailers do not need to worry about being forced to exit when large retailers involve in direct import activities, because as retailers grow bigger, they will import less and less. Also, retailers will expect that their decision about retail consumer prices will depend less and less on foreign prices.

The results provided by our estimations may not be reliable. This may largely due to the facts that the sample used is quite small (60 observations) and that one year cross-sectional data does not contain any information on changes in retail direct imports over time. What is more, there is a good chance that there is a causality problem between average size (AVE) and retail import (IMP). To test endogeneity it requires instrumental variable of AVE which should be highly correlated with average size variable but uncorrelated with retail imports. From an economics context, the n-firm concentration ratio, in our context the market share of

the largest n retail establishments in a retail sector market could be an instrumental variable of AVE. We can expect a larger average size of retailers in a retail market that is dominated by a few large retailers; and there seems no certain link between concentration ratio and retailers direct import. However, concentration ratio may not be a good instrumental variable to average size because it may be an explanatory variable with respect to the share of direct import. Further research on the topic is recommended to avoid these problems for instance by using time series, panel data and especially a large enough sample.

Appendix 1

The Derivation of Average Size Measure

In order to measure average employment size from the data in Table 1, an index of employment sizes is developed. Specifically, the mean of each employment class is taken. For example, the index to employment size 1-4 is 2.5 which is the mean of 1 and 4; the index to employment 5-9 is 7 which is the mean of 5 and 9. To index employment size 500 +, we use 600. Thus the indexes are as follows

1 to 4	5 to 9	10 to 19	20-49	50-99	100-199	200-499	500 +
2.5	7	14.5	34.5	74.5	149.5	349.5	600

Average employment size of a retail category is measured by

$$\frac{\Sigma \,(\textbf{employment size index} * \textbf{the corresponding number of establishement})}{\textbf{the total number of establishment}} \qquad (1)$$

Take Automobile Dealers for example, the indexes and the corresponding number of establishment are

Index	2.5	7	14.5	34.5	74.5	149.5	349.5	600
Counts of establishment	2508	817	1060	1349	711	260	42	3

With this method, the average employment size for Automobile Dealers is

$$\frac{2.5 * 2508 + 7 * 817 + \cdots + 600 * 3}{2508 + 817 + \cdots + 3} = 27.00$$

Appendix 2

The Derivation of Size Dispersion Measure

Given the cumulative relative frequencies of income y_n (n=0, 1, 2…k) and households x_n(n=0, 1, 2…k), the Gini coefficient may be calculated from the following formula:

$$G = 1 - \sum_{n=1}^{k}(x_n - x_{n-1})(y_n + y_{n-1}),$$

(2)

where $x_0=y_0=0$, $x_n=y_n=100\%$. In our case, we treat establishment size as income and establishments as households. Take again Automobile Dealers as an example of how cumulative frequencies and the Gini coefficient are computed (Table 2). The first step is to derive the cumulative frequencies of establishment counts and establishment size. With the establishment counts in each employment class in Table 1, the first cumulative percentage of establishments is the proportion of automobile dealer establishments under employment size 4 with respect to the total automobile dealer establishment counts. The total amount of employment is the average employment size times total establishment count which is 27*6750 which is 182218. The corresponding size cumulative frequency is the percentage of total employment in the first class compared with total employment 700 of the entire segment. The second cumulative establishment frequency is the proportion of the amount of employment of the establishments in the second class. The rest of the frequencies are derived in the same way.

Table 9 Gini Index Calculation

Employ-ment Range	Cumulative Frequencies y_n	$y_n + y_{n-1}$	Counts of Establish-ment	Cumulative Frequencies x_n	$x_n - x_{n-1}$
1 to 4	$\dfrac{2.5 * 2508}{182218} \times 100\% = 3.44\%$	3.44%	2508	37.16%	37.16%
5 to 9	$\dfrac{7 * 817}{182218} \times 100\% + 3.44\%$ $= 6.60\%$	10.02%	817	49.26%	12.10%
10 to 19	$\dfrac{14.5 * 1060}{182218} \times 100\% + 6.6\%$ $= 15.01\%$	21.59%	1060	64.96%	15.70%
20-49	$\dfrac{34.5 * 1349}{182218} \times 100\%$ $+ 15.01$ $= 40.56\%$	55.57%	1349	84.95%	19.99%
50-99	$\dfrac{74.5 * 711}{182218} \times 100\%$ $+ 40.56\%$ $= 69.62\%$	110.18%	711	95.48%	10.53%
100-199	$\dfrac{149.5 * 260}{182218} \times 100\%$ $+ 69.62\%$ $= 90.96\%$	160.58%	260	99.33%	3.85%
200-499	$\dfrac{349.5 * 42}{182218} \times 100\%$ $+ 90.96\%$ $= 99.01\%$	189.97%	42	99.96%	0.62%
500 +	$\dfrac{600 * 3}{182218} \times 100\% + 99.01\%$ $= 100\%$	199.01%	3	100.00%	0.04%

The Gini-coefficient for Automobile Dealers then becomes

$$G = 1 - \sum_{n=1}^{8}(x_n - x_{n-1})(y_n + y_{n-1}) = 0.6395 \qquad (3)$$

Appendix 3

Table 10 Estimations Results with GINI[4]
(dependent variables)

	Coefficients t-statistics			
GINI	1.2355 (1.07)	1.7161 (1.11)	-0.3078* (-1.66)	-0.4878** (-2.4)
NAVE		0.0015 (0.86)		0.0015 (0.86)
AAVE		0.0043** (2.44)		0.0043** (2.44)
EAVE		0.0043** (2.43)		0.0043** (2.43)
IMPW	0.6404 (1.47)	0.9145* (1.58)		
M			-0.3993* (-1.47)	-0.5702* (-1.58)
NAFTA	-0.0315** (-2.66)	-0.0504* (-1.74)	-0.0315** (-2.66)	-0.0504** (-1.74)
ASIA	-0.0946*** (-8.37)	-0.1491*** (-5.18)	-0.0946*** (-8.37)	-0.1491*** (-5.18)
EU	-0.0974*** (-8.27)	-0.1526*** (-5.53)	-0.0974*** (-8.27)	-0.1526*** (-5.53)
Number of observations	60	60	60	
R-squared	0.8306	0.8455	0.8306	0.8455

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[4] Retail segments dummies are not reported in the table but they are included in the estimations.

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