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Clothing Demand for Canadian-born and Foreign-born Households

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Abstract: This paper compares Canadian-born and foreign-born demand for clothing. In particular, emphasis is placed on impoverished Canadian households and those "at risk." Using data from the 1984, 1986, 1990 and 1992 Family Expenditure Surveys, I have estimated Engel elasticities and associated demand equations. I find that demographic factors significantly influence clothing expenditures; in particular, the foreign-born clothing demand is more elastic with respect to prices and less elastic to income changes than Canadian-born demand.

Key Words: Canada, immigrant demand, clothing, Engel Elasticities, Engel curves, demand equations.

I. INTRODUCTION

Clothing, along with food and shelter, is one of the basic human needs. However, few studies exist on the consumption of clothing, particularly in Canada. This study will address this gap in the literature, in particular, a dichotomy between Canadian-born households and those who have moved to Canada is drawn and analyzed.

Canada is a multicultural society that is home to families from virtually every other country. Thus, there is a great deal of variety in styles of clothing. Aside from tastes in fashion, however, do migrants to Canada display different behaviour in clothing budgets? This is the central question of this paper. Several statistical analyses will be used to determine if, first, the foreign-born and the Canadian-born allocate significantly different amounts of their incomes to clothing and, second, what is causing these differences.

These analyses will focus on low-income Canadian residents. This group was chosen because of the obvious constraints on their spending habits. Thus, if a low-income family immigrates to Canada, and we observe shortfall in clothing expenditures vis-à-vis low-income Canadian-born households, policy implications may follow this analysis.

Section II of the paper reviews the relevant literature. Section III examines the data sets used in the analyses. Section IV presents the first statistical analysis centered on computed Engel elasticities. An experimental analysis that dissects clothing discrepancies into income effects and differences in tastes follows in Section V. Finally, Section VI concludes.

II. LITERATURE REVIEW

A large body of economic literature is devoted to the understanding of consumption patterns for all types of goods and services.[1] Clothing expenditure, however, has rarely been examined on its own. Since clothing expenditure averages between 5 percent and 8 percent of a typical Canadian budget, and it is crucial in the Canadian climate, it warrants scrutiny. Though no Canadian studies exist, several other relevant studies exist and are summarized below.

[1] This paper is one of a continuing series of studies on Canadian immigrant expenditures. It follows similar RIIM Working Papers developed by Christiane Werner (2000), Don DeVoretz and Yunus Ozsomer (2000), and Galina Didukh (2001).

Nelson (1989) used United States Consumer Expenditure Surveys (CES) to measure the elasticity of clothing demand with respect to income. In particular, Nelson included demographic controls for gender, age and race (among others) and found that non-whites had significantly different clothing expenditures from their white counterparts. Though the white vs. non-white dichotomy does not provide insight on whether or not an individual is foreign-born, the results indicate that there may be cultural factors that influence clothing expenditure. Nelson's findings also show that occupation, age (particularly that of the father) and the mother's education level play significant roles in determining clothing expenditures.[2]

Darrough, Pollack and Wales (1983) looked at two major components of household spending. Their study examined British and Japanese family expenditure data to calculate own-price elasticities for clothing and food. Similar to Nelson's study, Darrough et al. used only "family" data, where a family is defined as two adults (one male and one female) and two children living in one household. The possibility of a sample-selection bias is clearly encountered here. Another key difference is the time period under analysis. The results were derived from Japanese data from 1953–1964, while the British data reflects expenditures in 1970.

Through a dynamic modeling process, it was found that food expenditures were affected by underlying economic conditions or shocks that affected the agents at an aggregate level. Clothing expenditure, conversely, was found to be more affected by independent shocks to individual households. This is important as it justifies our use of pooled data. We can draw upon a larger sample size to observe a greater array of individual expenditures.

There exists one body of work that is similar to this paper. Frisbee (1985) presents expenditure elasticities for clothing based on Canadian FAMEX data. Frisbee's data, however, is from 1978, pre-dating the sample periods for this study.

Using an Engel elasticity analysis similar to the one presented in Section IV, Frisbee reports that female-headed households consistently display higher elasticities than do male-headed households. This conforms to my expectations (discussed below). Frisbee also reports a wide array of geographic variation and differences that exist between employed and unemployed reference persons. It should be noted, of course, that my Engel analysis is based on total consumption while Frisbee's

[2] A significant drawback in using Nelson's study is that it relies upon only family data. Only two-parent families with children under the age of 18 (and no more than one child under age three) were eligible for inclusion in the survey. Thus, the characteristics of households in the CES differ sharply from those in the FAMEX Surveys conducted in Canada. The sample size, at 612 households after dropping selected observations, is also quite small. Since the CES is intended to reflect consumption patterns across the United States, a larger sample size may have introduced some desirable asymptotic properties to the results.

findings are based on total expenditure (which includes personal taxes, pension contributions, etc). Thus, the absolute magnitudes are not directly comparable. In relative terms, however, Frisbee's results closely match my findings (shown in Section IV).

The major drawback of Frisbee's work, in terms of its relevance to this paper, is its lack of distinction between Canadian-born and foreign-born households. He was not concerned with such an analysis and, therefore, his work is not perfectly matched to mine. There are some other minor definitional differences, but these should not significantly impact the results.

III. THE DATA

Definitions and Data Sources

The primary data source for this paper is a series of Canadian Family Expenditure ("FAMEX") surveys, in particular, the surveys compiled in 1984, 1986, 1990 and 1992. These surveys together report detailed information on over 25,000 Canadian families.

Several alterations were made to the sample to conform it to some predetermined standards. Most notably, the definition of the reference person was changed from the person who filled out the survey to the highest income earner in the household. Though this new definition is somewhat debatable, it reflects the assumption that the highest income earner will be the individual that most influences the household's budgeting decisions. This consistent definition of the household head allows us to label each household as either Canadian-born or foreign-born. Thus, if a given household head (highest earner) was born outside of Canada, that household will be categorized as foreign-born. This distinction drives the econometric analyses.

In line with other RIIM expenditure surveys, we have focused on households over the normal working life of a Canadian. Thus, those households with a head younger than 25 or older than 65 were excluded from the sample.

Variables Used in the Models

This section defines each of the variables used in the statistical analyses. Many important assumptions went into the creation or recoding of these variables, and thus detailed explanations are warranted.

Real Clothing Expenditure (RCLOTH) serves as the dependent variable in much of the analysis. FAMEX surveys report nominal expenditures, which include garments for men, women, boys, girls and infants, clothing materials and dry cleaning services. These figures were divided by

the Consumer Price Index for clothing and footwear to denominate them in 1992 dollars. The Engel elasticity analysis, however, uses budget shares (and not absolute dollar expenditures) as the dependent variable. I have divided RCLOTH by Total Current Consumption in 1992 dollars (RTOTCC), therefore, to create these real budget shares.

Real Household After-Tax Income (RHIAT) should be a significant predictor of clothing expenditures. Since clothing purchases normally come out of after-tax budgets, an increase in a household's real income should be coupled with a proportionate rise in clothing expenditure. RHIAT, then, is our primary variable of interest.

Since we are estimating a demand equation, we must capture the effects of prices. Although this is a difficult concept to evaluate, Browning and Thomas (1999) provide a table of clothing price indexes by province that will be adopted by this study. The data are in nominal figures; these are converted into 1992 dollars by dividing through by the all-items Consumer Price Index. The clothing price index for British Columbia in 1992 is then set equal to 100. The other provincial and annual prices, therefore, are clothing prices relative to this base category. Relative clothing prices will be denoted as "PRICE" in the regression models.

The age of the reference person (AGE) will impact the decision to buy clothing. The peak years for spending on clothing should occur at the same time that income reaches its peak (more specifically, between the ages of 35 and 45). This statement implicitly assumes that clothing expenditure follows some concave path over the life of the household. This will be tested by the including of the square of age (AGE2) as an independent variable. A negative sign on this coefficient will support the assumption that a peak, in fact, exists.

There may exist an assimilation effect for immigrants. As the foreign-born spend more time in Canada they may begin to alter their clothing budgets to suit different styles or climates. Thus, years since migration (YSM) might provide some valuable insight. Unfortunately, this variable does not exist in FAMEX data and must be approximated. FAMEX categorizes each immigrant into ranges of arrival years. For example, the survey may report that an individual arrived between 1975 and 1979. No further details are provided. Thus, to compute YSM, it was assumed that the individual arrived in the median year of the range. YSM, in this sense, only approximates the actual number of years in Canada. As with AGE, the square of YSM will be included as an explanatory variable. This variable will assure a negative sign if clothing expenditure is concave over the household's lifetime.

Gender may play a role in determining clothing demand; thus a dummy for the sex of the reference person has been included. This variable has been coded as zero for males and one for females, and the coefficient is expected to have a positive sign.

General economic conditions and changes in fashion trends will affect a household's annual purchases of clothes. The uncertainty of an economic downturn, for example, may convince consumers to make their clothes last a little bit longer. New trends in fashion, on the other hand, have an obvious positive effect on clothing demand. To capture these concepts in cross-sectional data, I have included a dummy variable for each of the FAMEX years included in the study (labeled Y84, Y86, Y90 and Y92). The base year is 1992 and, thus, Y92 is omitted from the regression equations.

Though Canada, in general, experiences hot summers and cold winters, this is certainly not the rule in all regions of the country. Climactic variation by province, therefore, warrants the inclusion of dummy variables for the Atlantic Provinces (ATL), Québec (PQ), Ontario (ON) and the Prairie Provinces (PR). British Columbia is omitted to establish it as the reference province. Since winters are (typically) warmer in British Columbia than elsewhere in the country, the regional dummies should positively impact clothing expenditures. All provincial dummies are coded as one for the province in which the household is located and zero elsewhere.

The reference person's marital status can significantly influence the demand for certain household commodities and thus we included this variable. Didukh (2001) found, for example, that married households increased their personal care and health care budget shares by 0.17 to 0.22 percentage points over households with an unmarried head.[3]

The employment status of the reference person is hypothesized to affect clothing expenditures. Thus, dummy variables for the reference person's field of work (with unemployed being the reference category) have been incorporated into the models. Three "field of work" variables are present:

- MANRES: set equal to one if the reference person works in a manufacturing, natural resource-related or other job,
- SERVCLER: set equal to one for those working in the service industry or a clerical position, and
- PRO: set equal to one if the reference person is a professional.

[3] These figures were statistically significant at all levels of testing, though the expected signs of these variables in this study are ambiguous.

It is assumed that all three variables will have positive signs. Furthermore, an assumption about their relative magnitudes can be made. One would expect that PRO would have the greatest effects on clothing purchases while MANRES would have the least. This is due, in part, to the value of clothing needed in the work place by individuals in each group.

As the number of people living in a household grows, so too must the household's clothing budget. Thus I control for the number of individuals that were living in each household as of December 31 of each year under analysis.

Until this point, no reference was made to the possibility that the children in a household might be working and purchasing their own clothes. Thus, the number of full-time and part-time earners (NFTE and NPTE, respectively) in a household was controlled for. It is expected that an increase in either of these variables will positively affect clothing expenditures.

It may also be instructive to examine the interaction of several of the above variables. In particular, AGESEX was formed by multiplying AGE and SEX together; AGEFAM is the product of AGE and FAMSIZE. These variables allow for a better understanding of how clothing purchases change as the head of the household ages. The expected signs follow from the above analyses.

To further dissect the composition of the household, it was necessary to include a measure of the number of children and seniors living in the household. Thus, CHILD12 measures the number of children under the age of 13 that lived in a given household at any time during the given survey year. SENIOR measures the number if individuals aged 65 and up in a household.

The education level of the reference person may affect tastes. Thus, education may indirectly influence clothing expenditures. Dummy variables for those with a college diploma or some university (COLL) and those with a university degree (UNIV) have been included. The reference category is a secondary school diploma or less and, therefore, both COLL and UNIV should positively influence income. Hence, their effects on clothing should also be positive.

A final set of variables has been used to predict RHIAT. Specifically, these are the numbers of full-time and part-time weeks worked by the reference person (WWFT and WWPT, respectively) and by the spouse (SWWFT and SWWPT). The impact that these variables will have on income is obvious.

Descriptive Statistics

Basic analyses of the data bring some of the differences between the Canadian-born and foreign-born to light. This section presents an elementary analysis of clothing expenditures, income and budget

shares for major subsamples within the data. FAMEX contains sufficiently detailed information to break the sample down by five different regions of birth, namely:

1. Canada;
2. United States, Britain and Northwest Europe;
3. Southern and Eastern Europe; and
4. China, Asia and Other Regions.

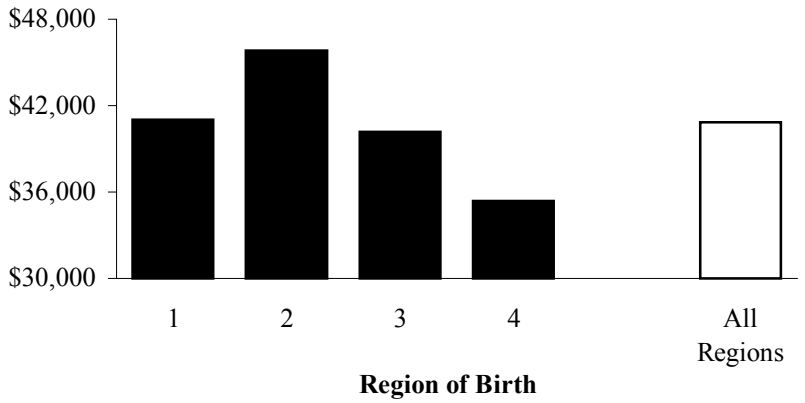
The "Other Regions" category in the list includes immigrants primarily from South America and Africa. These categories are still quite broad, but will illustrate any differences between the "old" source countries (Region 2 above) and the new.

Figure 1 below presents the mean real clothing expenditure by region of birth. The region numbers correspond to the list above. The graph shows that mean clothing expenditure ranged from a low of $2,223 for those born in China, Asia and Other Regions to a high of $2,725 for those born in Southern and Eastern Europe. The mean for those born in Canada is $2,632.

Figure 1: Mean Real Clothing Expenditure by Region of Birth in 1992

The average amount spent on clothing by households differs considerably by region of birth. This, of course, could be a function of the mean level of income for households from these regions. To explore this possibility, Figure 2 displays real after-tax income for each of the subsamples.

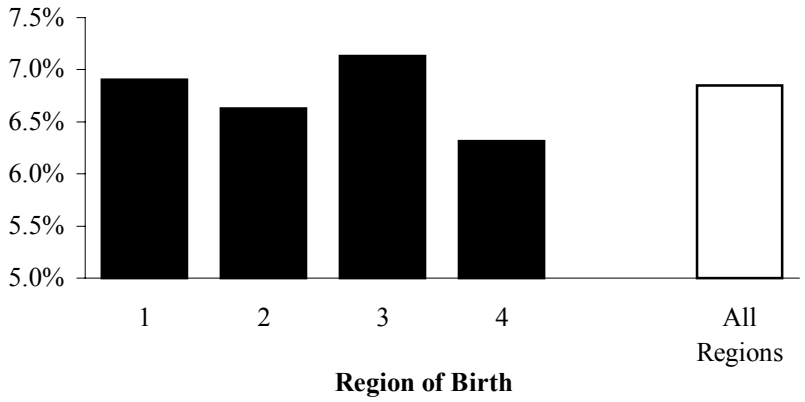
Figure 2: Mean Real After-Tax Income by Region of Birth in 1992



Region 4, with a mean household income of $35,389, ranks as the lowest of the four regions. This corresponds to the low clothing expenditure shown in Figure 1 above. The mean income of the Canadian-born ($41,009) ranks slightly ahead of the average for the entire sample ($40,826). The mean income for the foreign-born, therefore, must be below the mean. This income disparity will be returned to in Section V.

As discussed in the previous section, another variable of interest is the ratio of clothing consumption to total consumption. Figure 3 presents these budget shares by region of birth.

Figure 3: Mean Real Clothing Budget Share by Region of Birth in 1992



Again, some variation exists at the mean. Those born in China, Asia and Other Regions have the lowest real share at 6.3 percent. Migrants from South and Eastern Europe report the highest share, while the Canadian-born share is approximately equal to the overall mean of 6.9 percent. Though the differences are not large, the data nonetheless suggests different spending patterns for different groups in the sample.

Another important element is the variation of household clothing shares across time. Figure 4 presents a three-dimensional analysis that illustrates the fluctuations from 1984 to 1992 for each region.

Figure 4: Mean Real Clothing Budget Share by Region of Birth (1984-1992)

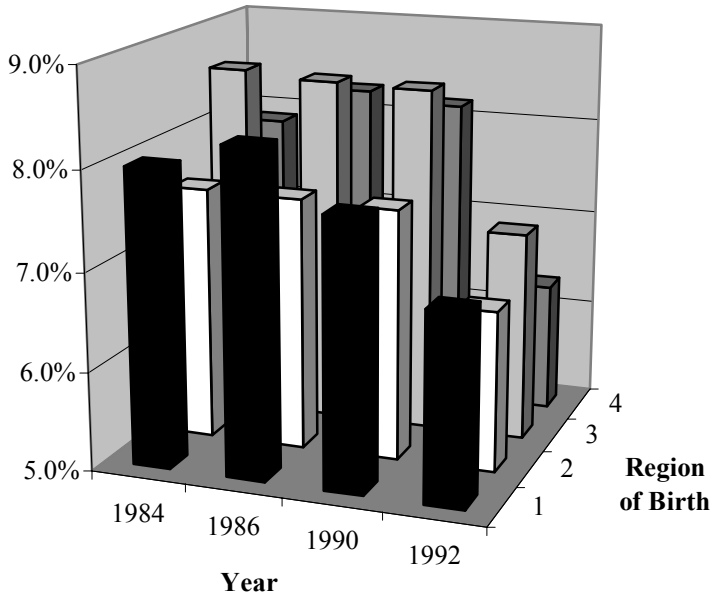


Figure 4 shows that the budget shares are dynamic across time. A distinct downward trend emerges for all regions; the budget shares drop from an average of 8.0 percent in 1984 to a lower average of 6.9 percent in 1992. This observation lends support to the inclusion of annual dummies in the regression models as a means of measuring macroeconomic and fashion trends.

Low Income Consumers: Impoverished Immigrants and Canadians

This paper will address in particular the clothing demand for both foreign-born and Canadians at risk. Thus, before the econometric analyses can be performed, it is necessary to develop a satisfactory definition of an "impoverished household." This has been the subject of extensive debate in economic literature.[4] Selecting either a relative or absolute measure of poverty, for example, can have important implications on the characteristics of the impoverished subsample of individuals or households. This section, therefore, is intended to arrive at an acceptable definition (or definitions).

[4] See Krishna Pendakur, 2001, "Consumption Poverty in Canada, 1969-1998", *Canadian Public Policy* 27 (2), for a good exposition of poverty measures in a Canadian context.

There exist two broad classifications for poverty lines: relative and absolute. Relative poverty lines, according to Pendakur (2001), are established in relation to the dynamic "community norms and standards." For example, Statistics Canada selects 50 percent of the median income level (as calculated from FAMEX data) as the Low Income Cut-Off (LICO) (Statistics Canada 2001). Several LICO values, determined by family size and province of residence, are reported for each FAMEX year. Thus, a richer Canadian society leads to a higher poverty line.

Absolute poverty lines, in contrast, typically depend on prices of commodities. In particular, the line is based on the minimum expenses necessary to survive in a particular province. Thus, those unable to afford some basic consumption bundle are classified as impoverished.

The preceding statement gives rise to a second debate among researchers: should the poverty line be measured against total income or total consumption? Pendakur suggests that the use of total consumption represents true deprivation since it is a measure of a household's choices. In other words, a household may have sufficient income but choose to (or be forced to) consume at some low level. This decision will affect the household's outcomes in labour markets and other arenas (Pendakur 2000: 128).

The purpose of this paper, however, is not to resolve the poverty line debate. For this reason, three low-income measures have been used in the analyses: LICO (a relative income measure), plus absolute income and consumption cut-offs provided by Sarlo 2001. The latter measure is the most restrictive of the three. Of the 16,878 households under analysis, a total of 1,970 were considered impoverished by LICO standards. This number drops to 766 and 551 for Sarlo's income and consumption cut-offs, respectively. The LICO measure will be used to form subsamples within the data to preserve degrees of freedom in the Engel elasticity analysis. In Section V, however, this study will employ on the most restrictive poverty measures to avoid any bias introduced by including relatively well-off households in the "impoverished" category.

IV. COMPUTATION OF ENGEL ELASTICITIES

This section reports the responsiveness of different demographic groups' clothing budgets to changes in income. I have broken the analysis of Engel Elasticities down into two subsections; the first reports "uncontrolled" elasticities while the second reports elasticities while controlling for demographic and economic factors. This methodology is used quite frequently in household expenditure studies; see, for example, Leser 1963, Didukh 2001 and Werner 2000.

Uncontrolled Elasticities

Engel elasticities and curves are used to categorize goods as either luxuries or necessities. The elasticity value is a function of the change in a household's budget share of a particular commodity (clothing, in this case) with respect to a change in the household's total expenditure. Thus, the following regression is run:

$$s_i = \alpha + \beta \ln(CC_i) + \varepsilon_i \tag{1}$$

where s_i is the real budget share spent on clothing and CC_i is (for the purposes of my study) total real current consumption. A disturbance term ε_i is also included. Using the estimated coefficient $\hat{\beta}$, we calculate the Engel elasticity value with the following equation:

$$e_i = 1 + \frac{\hat{\beta}}{s^*} \tag{2}$$

where e_i is the Engel elasticity and s* is the mean real clothing budget share for the sample. Equation (2) will be evaluated at budget share quartiles and not just s* as shown above.

A good is classified as a luxury if $e_i > 1$ and a necessity if $e_i < 1$. Notice, then, that luxuries must have a positive value of $\hat{\beta}$. If a household devotes a greater share of their consumption bundle to clothing as it consumes more goods, therefore, the associated Engel elasticity indicates that the household treats clothing as a luxury. It seems clear that some clothing expenditure is necessary for all households. We should expect clothing, however, to be treated as a luxury in our data set since most clothing purchases are for cosmetic (rather than essential) purposes.

Various subsamples were created to estimate elasticities across different demographic groups. In particular, elasticities were estimated for only Canadian-born respondents to FAMEX surveys, only foreign-born respondents, households above and below the poverty line and, finally, Canadian- and foreign-born households below the poverty line. As we investigate households living below the poverty line, we should expect the Engel elasticities to rise.

Table 1: Budget Shares and Uncontrolled Engel Elasticity Values				
Sample	**Lower Quartile**	**Median**	**Mean**	**Upper Quartile**
All	4.41% 1.46	6.94% 1.29	7.74% 1.26	10.13% 1.20
Canadian-born	4.45% 1.46	6.95% 1.29	7.45% 1.27	10.15% 1.20
Foreign-born	4.31% 1.44	6.85% 1.28	7.71% 1.25	10.08% 1.19
Above LICO	4.65% 1.41	7.14% 1.27	7.97% 1.24	10.38% 1.18
Below LICO	2.77% 1.67	5.09% 1.37	5.98% 1.31	8.20% 1.23
CB - Below LICO	2.75% 1.70	5.12% 1.38	5.92% 1.33	8.04% 1.24
FB - Below LICO	2.88% 1.61	4.99% 1.35	6.19% 1.28	8.64% 1.20

Focusing on the third column of Table 1, which reports Engel elasticities evaluated at the mean clothing share, we see that all subsamples treat clothing as a luxury. The difference between the Canadian-born and foreign-born elasticities, at 1.27 and 1.25 respectively, is inconsequential. When only low-income households are considered, however, we see that the foreign-born consider clothing to be less of a luxury. A similarly large difference is seen between those living above the poverty line and those living below it. Overall, however, the Engel elasticities are quite uniform throughout the subsamples.

Elasticities evaluated at quartiles also appear in columns (1-4) in Table 1. The general conclusions are the same but some new insights can be drawn. Moving horizontally across the reported values, we see a great deal of variation for the Canadian-born and the foreign-born below LICO. The elasticities for those at the lower quartiles, perhaps the most disadvantaged in the data set, seem to have little more than the minimum clothing. These Canadian households spend less than three percent of their total consumption on clothes, an amount that seems inadequate in our climate. These elasticities, however, ignore individual characteristics. This is dealt with in the following section.

Controlled Elasticities

It is the position of this paper that demographic factors will influence a household's decision to buy clothing. Thus, the above Engel elasticities are (in isolation) not highly informative. Using FAMEX

data on age, family size, occupation, etc., however, we can control for these factors and provide a new set of Engel elasticities for comparative purposes. This section deals with these "controlled" Engels.

The regression equation used is quite similar to Equation (1) above. Our main variable-of-interest is still the natural logarithm of real consumption, but we add a series of demographic control variables to the model. It is specified as follows:

$$s_i = \theta + \delta \ln(CC_i) + \sum_{1}^{n} \Omega_n X_{n,i} + \varepsilon_i \qquad (3)$$

where X_n are the series of demographic variables. These variables, described in Section III, are: AGE (and AGE^2), YSM and YSM^2 (where applicable), SEX, MARR, SEPDIV, FAMSIZE, Y86, Y90, Y92, ATL, ON, PQ, PR, COLL, UNIV, MANRES, SERV, PRO, WWFT, WWPT, SWWFT, SWWPT, NFTE, NPTE, AGESEX, AGEFAM, CHILD12 and SENIOR. Thus, the controls attempt to measure the effects of education levels, occupations, region and many other personal characteristics of the respondents. For each subsample, insignificant variables were dropped and the model was re-estimated. This procedure was repeated until all variables were statistically significant at the 5 percent level.

To calculate the Engel elasticity, $\hat{\delta}$ replaces $\hat{\beta}$ in Equation (2). If demographics indeed play a role in determining relative clothing budgets, we should see a significant difference in the resulting elasticities. Table 2 confirms this a priori intuition. The controlled elasticities are all significantly lower than the original uncontrolled values.

Table 2: Budget Shares and Controlled Engel Elasticity Values

Sample	Lower Quartile	Median	Mean	Upper Quartile
All	4.41% 1.26	6.94% 1.17	7.74% 1.15	10.13% 1.11
Canadian-born	4.45% 1.28	6.95% 1.18	7.45% 1.17	10.15% 1.12
Foreign-born	4.31% 1.19	6.85% 1.12	7.71% 1.11	10.08% 1.08
Above LICO	4.65% 1.24	7.14% 1.16	7.97% 1.14	10.38% 1.11
Below LICO	2.77% 1.03	5.09% 1.02	5.98% 1.02	8.20% 1.01
CB - Below LICO[§]	2.75%	5.12%	5.92%	8.04%
FB - Below LICO[§]	2.88%	4.99%	6.19%	8.64%

[§]Parameter estimates were insignificant because of small sample sizes

An Analysis of Clothing Budgets

This section of the paper is divided into two subsections: a regression analysis of clothing expenditures of different groups and a counterfactual analysis based on these regression results. We begin by developing a model of clothing demand.

Demand for Clothing: Canadian-born and Foreign-born

The previous analysis centered on explaining the factors that affect clothing's share of a Canadian household budget. This analysis asks how demographic and economic factors affect the absolute dollar value spent on clothing. To answer this, the following model was estimated for three groups (the entire sample, the Canadian-born and the Foreign-born):

$$\ln(RCLOTH) = \alpha_1 + \alpha_2 \ln(RHIAT) + \alpha_3 \ln(PRICE) + \sum_{1}^{n} \Theta_n X_n + \varepsilon \tag{4}$$

where RCLOTH, RHIAT and PRICE are as defined above. The vector of demographic variables X has changed from the previous analysis, and changes again with each sample that is estimated. In particular, the variables YSM and YSM2 are added to the Foreign-born specification. In the discussion that follows, the parameter estimates for the Canadian-born will be denoted with a subscript “C” and the Foreign-born coefficients will have the subscript “F.” Coefficients for the entire sample will appear as in (4).

Before presenting the results, it is necessary to discuss an additional procedure that was undertaken. Since we are dealing with cross-sectional data, it is likely that we will have heteroskedastic errors in our regressions. This has the effect of invalidating inference testing, though the coefficient estimates remain unbiased. Using a White test, under the null of homoskedastic errors, we find an F-statistic that exceeds the critical value. Thus, I have used OLS with an estimate of the heteroskedasticity-consistent error covariance matrix. This method is designed to provide more accurate test statistics.

The results of the three regressions are shown in Table 3. Nearly all coefficients have the expected sign and, for cross-sectional data, the model provides a relatively good fit.

Table 3: Estimated Coefficients for Clothing Demand Model - Dependent Variable: ln(RCLOTH)			
Variable	Full Sample	Canadian-born	Foreign-born
Constant	-1.5105*	-1.7622*	-0.0032*
ln(RHIAT)	0.8376*	0.8609*	0.7369*
ln(PRICE)	-1.2948*	-1.1321*	-2.1297*
AGE	-0.0167*	-0.0157*	-0.0386*
AGE2	-0.00004	-0.00004	0.0001
SEX	-0.2190*	-0.2083*	-0.2693*
Y84	0.2034*	0.2008*	0.2333*
Y86	0.2358*	0.2390*	0.2397*
Y90	0.0964*	0.0924*	0.1335
ATL	-0.0238	-0.0159	-0.0916
PQ	0.1124*	0.1211*	0.0295
ON	0.0684*	0.0500*	0.0939*
PR	0.1072*	0.0967*	0.1285*
MARRIED	0.1247*	0.1054*	0.2409*
SEPDIV	0.1249*	0.0930*	0.3143*
MANRES	-0.1238*	-0.1412*	-0.0656
SERVCLER	0.0151	0.0129	0.0206
PRO	0.0408**	0.0483**	0.0090
FAMSIZE	0.0924*	0.0982*	0.1280*
SARLOC	0.5364*	0.5231*	0.5761*
NFTE	0.0949*	0.1008*	0.0681*
NPTE	0.0854*	0.0866*	0.0792*
AGESEX	0.0009	0.0039	0.0029
AGEFAM	0.0047*	0.0048*	0.0055*
CHILD12	-0.0400*	-0.0254	-0.0894*
SENIOR	-0.0544**	-0.0660**	-0.0110
YSM	-	-	0.0067
YSM2	-	-	-0.00008
Adjusted R^2	0.499	0.511	0.456
*(**) significant at the 5% (10%) level of testing			

It is also apparent that the Canadian-born and foreign-born have significantly different income elasticities. While $\hat{\alpha}_2^C$ is 0.86, the foreign-born do not react as strongly to changes in income. The regression indicates that foreign-born households will increase their clothing expenditure by only 0.74 percent for every one percent increase in income.

The price elasticities for each group are dramatically different. Both the full sample and the Canadian-born have elasticities relatively close to unity. Table 1 shows, however, that $\hat{\alpha}_3^F$ is –2.13. Thus, the foreign-born tend to significantly reduce their demand for clothing when prices increase.

An aging effect is significant in both subsamples. The concavity of the age profile, however, does not hold and the YSM and YSM2 variables are insignificant. Even at the 10 percent level, an additional year in Canada has an insignificant impact on an immigrant household's clothing demand. This indicates that a process of assimilation is non-existent.

An additional effect from aging can be seen in the interaction variable AGEFAM. Though AGESEX was insignificant, we see that clothing budgets receive an additional boost from the aging of a given household size. This data strongly suggests that the age of the household head is an important determinant of clothing demand.

Gender plays a significant role in the decision to buy clothes. For all groups, male-headed households purchase between 18.8 percent and 23.6 percent less clothing than female-headed counterparts.

The most significant effects come from the annual dummies. A Canadian-born household in 1986, for example, demanded 27.0 percent more clothing than in 1992 (holding prices constant). This is most likely due to macroeconomic factors. During the early 1990s, Canada experienced a deep recession; since Canadians on the whole consider clothing to be a luxury, it appears as though new clothing purchases were reduced in annual household budgets. This same household would have spent 9.7 percent more in 1990 than 1992, suggesting that clothing demand fell gradually as the economy worsened. Figure 5 displays the additional demand for clothing (relative to 1992) for the full sample plotted against Canada's annual GDP growth rate. The two follow strikingly similar paths over time.

Figure 5: Additional Clothing Demand Per Year vs. GDP Growth (Additional Clothing Relative to 1992 Level)

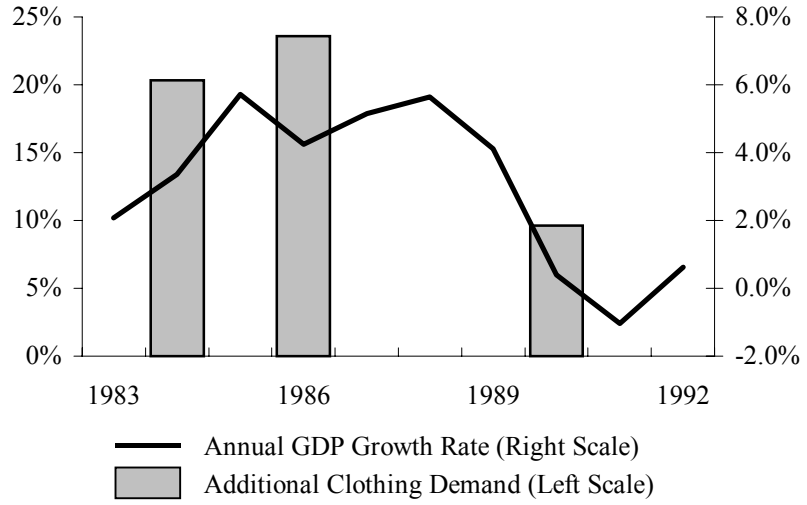


Table 3 also confirms the speculation that "colder" provinces would produce higher clothing expenditures. Except for the Atlantic Provinces, this holds true for every region outside of British Columbia. In particular, the foreign-born tend to react to this regional effect more than the Canadian-born do. While Canadian-born households, living from Alberta to Québec, spend up to 12.9 percent more than their counterparts in British Columbia, the difference among immigrant households is as high as 13.7 percent.

The other demographic variables in the model significantly influence clothing demand. As with other commodities, clothing is impacted by the marital status of the household head. Clothing demand is actually lower for those who work in the manufacturing and resource sector, relative to unemployed households. This might be the result of work-clothes being provided by employers in this sector, but the underlying reason is not clear. Family size, however, is significant at any level of testing and has the expected positive sign. A peculiar result arises from CHILD12 and SENIOR. These variables have the wrong sign (but are rarely significant at the 5% level).[5]

Finally, those who meet the basic consumption requirements under Sarlo's poverty cut-off line consume dramatically more clothing than do those below the line. The greatest effect is seen in the foreign-born sample, where those above Sarlo's poverty line consume an additional 77.9 percent

[5] This might be related to the FAMSIZE variable. Note that FAMSIZE has a positive sign and a greater magnitude (in absolute value) than CHILD12 or SENIOR. These results together imply that as the family size increases, clothing budgets will increase at a decreasing rate.

in clothing.[6] This reaffirms the classification of clothing as a luxury in Section IV. This finding indicates that impoverished Canadians, regardless of their country of birth, are at a significant disadvantage in terms of purchasing adequate clothing. This is a key result of this paper.

Counterfactual Analysis of Households at Risk

This analysis uses the results of Table 3 to predict clothing expenditures for specific households. By selecting particular household characteristics, such as education or employment by sector, I can focus my analysis on only economically disadvantaged Canadians. The characteristics were chosen such that the households were either low-income earners, potentially unable to meet basic consumption requirements, or those whose future income streams may put them into that situation. Henceforth, these households will be referred to as "households at risk."

The goal of this analysis is to determine how Canadian-born and foreign-born households at risk differ in their clothing expenditures. In particular, we wish to find out the proportion of the difference in clothing demand that can be attributed to income differences. A foreign-born household, for instance, may be consuming an insufficient amount of clothing due to labour market discrimination which leads to a low income. The simulation exercise allows me to partition deficient clothing consumption into two parts: the difference due to income and the difference due to tastes (or possibly other unobservables such as gifts).

Characteristics of the Households at Risk

I have created five representative "households at risk." The following is a brief description of the characteristics of these households. These characteristics were used to filter the sample, collect median income levels and to predict the households' clothing expenditure levels.

- Household 1 – This household is headed by a separated or divorced 30-year-old female with two children (under the age of 13), working part-time in the service industry.
- Household 2 – A married male with only secondary school education is the primary income earner, but has been unemployed for at least three months. The couple has two children aged 12 or younger and the spouse does not work. The head is 40 years old.

[6] This figure is based on the assumption that all other variables, including income, are being held constant. Thus, two households may have sufficient income but one, possibly due to debt loads, is unable to consume the basic consumption amount.

- Household 3 – A female-headed household with no children. Both the head and her spouse are unemployed and have no post-secondary education. The head is 28 years old.
- Household 4 – A single 64-year-old female living alone. This individual is retired.
- Household 5 – A single male with a secondary school education, unemployed for at least three months.

The median real after-tax income for households matching each of the above descriptions was computed. These are presented in Table 4 below. We can see that income estimates tend to be higher for the Canadian-born. Almost identical levels of income are predicted for HH2, while HH4 with a foreign-born head is expected to have substantially higher income.

Table 4: Median Real After-tax Income for Specified Households – 1992 CDN$

	HH1	HH2	HH3	HH4	HH5
Canadian-born	19,862	27,771	24,645	11,739	15,284
Foreign-born	15,217	27,928	19,572	13,822	12,799

Empirical Analysis

The first stage in the counterfactual analysis is to assign values to the regression variables to match the above characteristics. This will provide two estimates of clothing demand based on each sample's unique regression coefficients. Focusing on Household 1 ("HH1"), we can predict the Canadian-born and foreign-born clothing expenditures by plugging the appropriate values into the demand equations. All households are assumed to be living in British Columbia in 1992 and prices are held constant.

By taking the exponential of the value resulting from the Canadian-born and foreign-born equations, we get predicted clothing expenditures of $1,092 and $535, respectively. Thus, the Canadian-born household is expected to consume over twice as much clothing as a similar foreign-born household will.

Several points must be made about the calculations. Note that all insignificant coefficients have been omitted even if the associated variable was used to collect income levels. In addition, the Canadian-born household's median income level positions it above the Sarlo consumption cut-off.[7] Despite having characteristics similar to those of the Canadian-born household, the foreign-born

[7] This holds under the assumption that both households are consuming less than 100% of their real after-tax income.

version of HH1 is failing to meet a sufficient level of consumption. Their purchases of clothing suffer as a result.

We can also answer the question: what would the foreign-born income have to be to completely eliminate this simulated disparity in clothing demand? With estimates of the foreign-born income elasticity of clothing ($\hat{\alpha}_2^F$) and the predicted clothing expenditures ($CLOTH_C$ and $CLOTH_F$) we can compute an "income multiplier." This multiplier (denoted "M") will be used to inflate the foreign-born income to the necessary level to equalize clothing expenditure. M is computed by taking the exponential of the difference in clothing expenditures divided by $\hat{\alpha}_2^F$. Mathematically, we use the following expression:

$$M = \exp\left[\frac{\ln(CLOTH_C) - \ln(CLOTH_F)}{\hat{\alpha}_2^F}\right]$$

$$\therefore M = \frac{(CLOTH_C)^{\frac{1}{\hat{\alpha}_2^F}}}{(CLOTH_F)^{\frac{1}{\hat{\alpha}_2^F}}} \qquad (7)$$

Applied to the case of HH1, we find M = 2.64. In other words, equation (7) indicates that the foreign-born household would need $40,118.52 of after-tax income to consume the same $1,092 bundle of clothing as the Canadian-born household.

The above analysis, however, explicitly takes $\hat{\alpha}_2^F$ into consideration. Since the multiplier is a function of the foreign-born household's income elasticity, I correct for an income disparity and adjust for differences in preferences between the groups. It is more informative to calculate the foreign-born clothing expenditure after eliminating only the income discrepancy. This is performed below in the third stage of the analysis.

The income discrepancy is easily eliminated by "endowing" the foreign-born with a level of income identical to the Canadian-born. Under this scenario, the foreign-born HH1 is predicted to spend $651 on clothing. Though the households have identical incomes, they simply choose to consume different levels of clothing. The original clothing difference, therefore, can be broken down into a $116 income effect and a $442 difference due to tastes.

We can view this result from another perspective. The foreign-born household could be given a $234 voucher that could be used for clothing only. A voucher in this amount ensures that the

disadvantaged household is able to purchase an amount of clothing on par with its more "well-off" Canadian-born counterpart.[8] This, of course, assumes that other spending will not be adjusted once the voucher has been received.

Similar calculations are provided for the remaining households. Note that in cases where the foreign-born household had a higher median income than the Canadian-born household, no income transfer was made to the foreign-born. Figure 6 provides all of the calculations.

Figure 6: Analysis of Canadian-born and Foreign-born Clothing Budgets Before and After an Income Endowment

	HH1	HH2	HH3	HH4	HH5
Median Income (CB)	19861.74	27770.98	24645.00	11739.18	15283.63
Median Income (FB)	15217.37	27927.88	19572.35	13821.50	12798.89
At Median Income Levels					
Predicted Clothing Expenditure (CB):	1092.19	1427.54	1345.88	416.68	702.94
Predicted Clothing Expenditure (FB):	534.64	899.40	1172.57	211.05	554.99
Difference	**557.55**	**528.15**	**173.31**	**205.63**	**147.95**
Income Multiplier	2.636	1.872	1.206	2.517	1.378
(Multiplier)*(FB Income)	40118.52	52276.97	23598.61	34789.93	17638.11
After Income Endowment					
Predicted Clothing Expenditure (CB):	1092.19	1427.54	1345.88	416.68	702.94
Predicted Clothing Expenditure (FB):	650.58	899.40	1389.61	211.05	632.51
Difference	**441.61**	**528.15**	**-43.72**	**205.63**	**70.43**
Expenditure Difference Due to Income	**115.94**	**0.00**	**217.04**	**0.00**	**77.52**
Expenditure Difference Due to Tastes	**441.61**	**528.15**	**-43.72**	**205.63**	**70.43**

In every household, the Canadian-born are expected to consume more clothing than their foreign-born counterparts. The difference is substantial for those households consuming close to or below a Sarlo consumption cutoff. The analysis of HH3 shows that over 20 percent of the clothing difference is attributable to a wide income gap between the foreign-born and the Canadian-born; this income effect increases to 150 percent of the difference for HH5. Clearly, a foreign-born household at risk faces additional challenges due to typically lower expected earnings.

It must be noted that substitutes for "regular" clothing exist. That is, households with low income may switch to second-hand or discount clothing to fulfill their needs. Therefore, it is probably too severe to claim that those below the Sarlo consumption line (for example) are unable to provide sufficient clothing for their families in the winter. The observed effects may actually be illustrating a movement towards more inexpensive clothing.

[8] The author does not advocate such a policy. The calculations are provided for expositional purposes only.

VI. CONCLUSIONS

The statistical analyses of FAMEX data provide many insights into clothing demand in Canada. In particular, it is clear that the Canadian-born and the foreign-born react differently to shocks to prices and income. Regression analysis reveals that the foreign-born are more elastic with respect to prices and less elastic to income changes, as shown in Table 3. Further, coefficients on demographic characteristics differed substantially between the two groups.

Through the counterfactual analysis of Section V, we find that Canadian-born households often earn more than do foreign-born households. This directly translates into lower clothing consumption by immigrants. The analysis, however, is able to separate this income effect from differences in tastes and other unobservables.

Due to small sample sizes, I was unable to provide reliable parameter estimates for additional subsamples. These groups might include immigrants from specific regions and those households living below some predefined poverty line. Additional research into this area is warranted when data is available. Since "new" immigrants tend to come from different regions than their predecessors, we may compile a wider and more informative array of regression results in the future.

This paper has filled a gap in Canadian expenditure research. Though Frisbee has presented similar analyses, little comparable research on clothing expenditure (in the Canadian context) has been published in the last fifteen years. In short, I do present evidence to explain the observed differences in clothing expenditure by foreign birth status in Canada.

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