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**Household Operations and Furnishings Consumption Patterns of Canadian and Foreign-born Consumers**

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# Household Operations and Furnishings Consumption Patterns of Canadian and Foreign-born Consumers: 1984-1996

by

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**Abstract:** This paper compares the demand for household operations and furnishings for Canadian-born and foreign-born consumers, using 1984, 1986, 1990, 1992 and 1996 Family Expenditure Surveys. Engle elasticities and a life-cycle model for household operations and furnishings are computed. Household operations are found to be income inelastic, while furnishings are income elastic. Expenditures on household operations and furnishings decrease in a convex fashion over and adult's life cycle. A foreign-born household spends slightly more on households operations and furnishings initially, and then its expenditure converges to the Canadian-born household after age 50. A disaggregation of the data detects further differences in expenditure patterns for females, mortgage holders and the poor.

## I. Literature Review

Immigrants upon arrival and during their integration process affect the Canadian economy in general and retail markets in particular. There exists an extensive body of literature related to the immigrant's impact in the labor market and on the treasury, but only a small literature exists on immigrant demand for commodities and services in the Canadian context. In particular, econometric studies on the demand for household operations do not yet exist. Thus this study will fill a minor but significant gap in the immigrant and general household demand literature.

In addition to filling this void in the literature, this study is motivated by several other factors. First, a review of the 1984 to 1996 Family Expenditure Survey indicates that household operations and furnishings expenditures constitute a large share of the average household's total expenditures or eleven percent for all resident Canadian households. This expenditure share constitutes the fourth largest expenditure group amongst the thirteen major expenditure categories reported.[1] Beyond the absolute size of the expenditure share, household operations include some crucial subcategories including hydro and water, which form part of the basic needs for immigrants upon arrival. Thus, the combined size of the expenditure share for household operations and the crucial nature of some subcategories warrant an analysis to determine the conditioners of household operations consumption patterns for both immigrants and the Canadian-born.

Since a central focus of this study will be on the differential expenditure patterns of Canadians vis-à-vis Canada's immigrant population, we must first ask why we would expect a differential experience. Again the immigration literature is informative to us. Shamsuddin and DeVoretz (1997) site several differences in the immigrant population which can alter their expenditure patterns for assets.

Since immigrants are a doubly selected sample from abroad, they will perhaps behave differently from the Canadian-born population. First, if immigrants self-select to move, then the more highly motivated would enter Canada. In addition Canada selects

[1] In fact, for transportation, personal and private health care, food and clothing expenditures, households report shares of 12 percent, 2 percent, 20 percent and 8 percent, respectively.

immigrants partially based on labor market and demographic criteria. Thus the income performance and household budget constraint may differ by birthplace over the household's lifetime because of the ability differences which may arise between the Canadian-born and foreign-born populations.

Third, Canada's immigration policy has changed over time. In 1965, Canada introduced a points system (based on education, occupation, experience, age, *etc*.), which replaced 'country of origin' as a selection criterion. In 1977, family reunification rules were relaxed. One major result of the switch from a skill-based points system to a family reunification system has been a shift to non-traditional source countries. This may influence consumption patterns given their variety of tastes and the persistence of habits.

A limited number of recent Canadian studies have begun to investigate immigrant expenditure patterns in the post-1990 period. Shamsuddin and DeVoretz (1997) examine wealth accumulation and asset demand of Canadian and foreign-born households in Canada. In addition, Didukh (2001), Werner (2000) and Shahabi-Azad (2001) investigate Canadian and foreign-born household demand for health, food and transport respectively. Two general features can be drawn from these studies. First, a life-cycle model rationalizes lifetime consumption patterns of both the foreign-born and Canadian-born households in these studies. In addition, they all successfully employ a standard estimating technique owing to Working (1943) and Leser (1963). This technique employs a semilog version of Engel functions curves to estimate total expenditure elasticities for the relevant expenditure groupings. I note at this point that this semilogistic model also conforms to the properties associated with utility maximization and this, combined with its persistence in the literature, lead me to choose this functional form.

## II. Data Description

This section provides a brief discussion of the data used in this study, definition of key variables and some sample statistics.

*A. Data Definitions*

The data sets used for this analysis are derived from the 1984, 1986, 1990, 1992 and 1996 Family Expenditure Surveys (FES).

In order to provide a more homogeneous sample across the sampling period, the data was transformed as follows. The 1986, 1992 and 1996 surveys had both urban and rural households data, while the 1984 and 1990 surveys only have data for Canada's 15 largest Census Metropolitan Areas (CMA's). Thus the non-urban household observations were filtered out in the 1986, 1992 and 1996 surveys to get a more consistent sample. The resulting truncated sample should still be representative of the general Canadian population, since over 86 percent of Canadian population lives in cities.

The second set of transformations was made to screen out observations which would lead to definitional problems. First, households with non-positive income were excluded from the sample. Also, some observations with "not stated" answers to questions about age, etc. were excluded.

Other adjustments were made to sharpen the immigrant concept and experience. To better define the immigrant experience, all immigrants who came to Canada before age16 were excluded from the sample. The rationale for this exclusion is that immigrants arriving at a younger age will assimilate faster and probably will not differ from Canadian born significantly once they are household heads.

In addition, an immigrant household in my analysis is defined very conservatively. If the reference person-defined as the largest earner in the household- is an immigrant, the household was classed as an immigrant household. This implies that foreign-birth status in my model is imputed by the country of origin of the primary income earner, and not the status of a possible spouse. These various adjustments and exclusions ultimately decreased the size of the pooled sample from 29,209 households to 19,572.

Turning to the expenditure group under analysis I note that the household operations and furnishings expenditure as recorded in the surveys include a broad

definition of direct costs and insurance premiums (see Table 1). The direct costs in turn include three sub-groups: expenditures on household operations; water, fuel and electricity expenditures; and expenditures on household furnishings and equipment. These groupings can in turn be viewed for my later analysis as a version of variable costs (direct, plus insurance) and sunk costs (furniture).

The broad category, household operations expenditures, such as communications, cleaning supplies, flowers and garden supplies, account for the largest proportion (on average, more than 40 percent) of total household operations and furnishings expenditures. The second largest share (32 percent) is devoted to water, fuel and electricity expenditures. Given both the definitions of these categories and their respective importance, I will later treat expenditure on furnishings as a household durable expenditure, while water, fuel, electricity and household operation spending will be considered a variable expenditure.

**Table 1: Definition of Household Operations & Furnishings Expenditure**

- 1. Homeowner's Insurance Premiums

- 2. Water, Fuel and Electricity
  ( = Water and Sewage + Fuel Oil and other Liquid Fuel + Natural Gas + other Fuel + Electricity )

- 3. Household Operation
  - Child Care Expenses
  - Pet Expenses
  ( = Communications + Domestic and other Custodial Services + Household Cleaning Supplies + Paper, Plastic and Foil Household Supplies + Flowers and Garden Supplies and Services)

- 4. Household Furnishings and Equipment
  ( = Household Furnishings + Household Equipment + Maintenance and Repairs of Furniture and Equipment )

*B. Stylized Facts*

Table 2 reports the descriptive statistics of household operations and furnishings expenditures and some other relevant variables.

**Table 2: Some Sample Descriptive Statistics for my Pooled Sample: 1984-1992**

| | **CB** | | | | | **FB** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | Minimum | Maximum | Mean/ percentage | Std. Deviation | N | Minimum | Maximum | Mean/ percentage | Std. Deviation |
| age | 16161 | 20.00 | 80.00 | 45.55 | 16.05 | 3411 | 20.00 | 80.00 | 50.30 | 15.8 |
| gender-male | 10330 | --- | --- | 64% | --- | 2353 | --- | --- | 69% | --- |
| marital status-Married | 9764 | --- | --- | 60% | --- | 2209 | --- | --- | 65% | --- |
| -Single | 2747 | --- | --- | 17% | --- | 399 | --- | --- | 12% | --- |
| family size | 16161 | 1.00 | 10.00 | 2.56 | 1.35 | 3411 | 1.00 | 9.00 | 2.79 | 1.5 |
| real year in CA | --- | --- | --- | --- | --- | 3411 | 1.00 | 52.00 | 25.10 | 14.1 |
| real total expenditure | 16161 | 298.00 | 333547.70 | 46003 | 28948.39 | 3411 | 3613.04 | 286998.93 | 45352 | 30686.5 |
| real HOF expenditure | 16161 | 1.39 | 38221.51 | 4138 | 2908.15 | 3411 | 18.00 | 52596.67 | 4324 | 3450.4 |
| HOF share | 16161 | 0.00 | 1.70 | 0.11 | 0.10 | 3411 | 0.00 | 13.26 | 0.11 | 0.2 |
| real hiat | 16161 | 143.41 | 210251.00 | 37990 | 22628.85 | 3411 | 150.00 | 196020.00 | 31709 | 20922.9 |
| number of rooms | 16161 | 1.00 | 12.00 | 5.74 | 2.18 | 3411 | 1.00 | 12.00 | 5.86 | 2.2 |
| value of owned house | 16161 | 0.00 | 999999.00 | 110678 | 78379.47 | 3411 | 0.00 | 999999.00 | 137947 | 101214. |
| change of dwelling | 16161 | --- | --- | 30% | --- | 3411 | --- | --- | 29% | --- |
| | **OWNER** | | | | | **RENTER** | | | | |
| | N | Minimum | Maximum | Mean/ percentage | Std. Deviation | N | Minimum | Maximum | Mean/ percentage | Std. Deviation |
| age | 11191 | 20.00 | 80.00 | 48.64 | 14.68 | 8381 | 20.00 | 80.00 | 43.36 | 17.4 |
| gender-male | 8390 | --- | --- | 75% | --- | 4293 | --- | --- | 51% | --- |
| marital status-Married | 8334 | --- | --- | 74% | --- | 3639 | --- | --- | 43% | --- |
| -Single | 871 | --- | --- | 8% | --- | 2275 | --- | --- | 27% | --- |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| family size | 11191 | 1.00 | 10.00 | 2.92 | 1.39 | 8381 | 1.00 | 9.00 | 2.17 | 1.27 |
| real year in CA | 11191 | 0.00 | 52.00 | 27.24 | 12.14 | 8381 | 0.00 | 52.00 | 21.43 | 9.71 |
| real total expenditure | 11191 | 298.00 | 333547.70 | 55658 | 30951.36 | 8381 | 1905.69 | 234675.45 | 32845 | 20555.57 |
| real HOF expenditure | 11191 | 316.26 | 52596.67 | 5263 | 3123.43 | 8381 | 1.39 | 23043.94 | 2712 | 2101.62 |
| HOF share | 11191 | 0.01 | 13.26 | 0.13 | 0.16 | 8381 | 0.00 | 1.70 | 0.09 | 0.07 |
| real hiat | 11191 | 225.35 | 210251.00 | 46468 | 23994.34 | 8381 | 112.00 | 140000.00 | 22726 | 13661.13 |
| number of rooms | 11191 | 1.00 | 12.00 | 6.88 | 1.86 | 8381 | 1.00 | 12.00 | 4.26 | 1.63 |
| value of owned house | 11191 | 3600.00 | 999999.00 | 115934 | 79997.67 | --- | --- | --- | --- | --- |
| change of dwelling | 11191 | --- | --- | 24% | --- | 8381 | --- | --- | 37% | --- |

Source: Pooled FAMEX 1984-1992

Anticipating the results the data set is first separated by country of origin - Canadian-born and foreign-born households; then by class of tenure - owners and renters.

This decomposition indicates that 83 percent of the samples consist of Canadian-born households, while17 percent of the sample are foreign-born households. This conforms closely to the actual distribution of the population.[2] In my pooled sample, the average age of the household head is 46 for Canadian-born, and 50 for foreign-born, reflecting the fact that a majority of the immigrants have been in Canada for an average of 25 years. This age structure will prove central to the study as I will argue that age will be a crucial argument in the demand for household operations and furnishings.

Marital status and gender can condition household operation expenditures and I note that more than 64 percent of the sampled households are headed by males, and more than 60 percent of the sampled households have a married head. The substantial number of female and unmarried households in the sample further implies that this study must disaggregate its demand functions by gender and marital status. Family size is noted in the literature to condition household expenditures in a unique way and I note that foreign-

born households have a slightly larger family size (2.79) than Canadian-born households (2.56). This difference partially arises from the higher proportion of single households for Canadian-born.

Finally, foreign-born households (11.2 percent) have a slightly higher budget share than Canadian-born households (11.1 percent) as measured by the percent of total expenditure devoted to household operations and furnishings. As earlier noted this 11 percent share is substantial when it is compared to the budget shares reported for clothing (8 percent) and transportation expenditures (12 percent). In addition I note that foreign-born households spend more on their shelter ($137,947, in1992 dollars) than Canadian-born ($110,678). This difference in ownership patterns may thus influence the greater absolute expenditures spent by the foreign-born ($4,324) than Canadian-born households ($4138) on household operations in our sample.

Further anticipating our test results below I sub-divide my sample to reflect tenurial status-ownership versus renting and note the following. First, 57 percent of all households are homeowners with 56 percent of Canadian-born households owning their homes and 63 percent of the foreign-born households being homeowners. On average homeowners are older than renters by 6 years. In addition, length of time in Canada affects the foreign-born homeowner tenurial status. Those foreigners who own their house have been in Canada 6 years longer than foreign-born renters, indicating that length of stay in Canada may ultimately affect household expenditures.

I further note some general differences in the stylized facts by tenurial status, which may prove important in our later modeling. First, homeowners are dominated by male-headed households (75 percent), while only 51 percent of renters have males as a head. In addition, the marital status of owners is quite different from renters, with 74 percent of the homeowner population being married, while only 43 percent of renters are married.

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[2] The 1996 FAMEX data shows that 82 percent of the sample population consist of Canadian-born households, while18 percent of the sample are foreign-born households.

The most important difference noted is that homeowners spend more on household operations and furnishings ($5,263 per year) than renters ($2,712 per year), In addition, the budget share spent on household operations and furnishings is greater for owners (13 percent) than renters (9 percent). It is important to note at this point that some of this difference may arise from measurement errors and will be dealt with later.

My later analysis will concentrate on immigrant households at risk, I note now some conventional low income measures in my sample. First, 19 percent of all households received unemployment insurance over the survey period. In addition, 10 percent of all sampled households received social insurance payments. In fact, 13 percent of the households in the sample did not reach the low-income cut-off (LICO) as defined by Statistics Canada3.

In summary, this set of stylized facts lead me to note:

1. The homeowner and renter populations are different and should be treated separately in the demand analysis.
2. Age of head, length of time in Canada for the foreign born are potentially crucial variables to incorporate in the model.

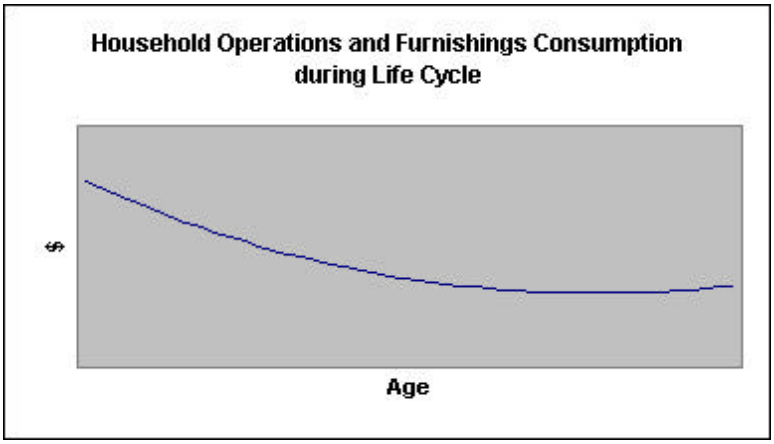
[3] Household with total income below LICO is defined as a low-income or poor household, and household with total income equal or above LICO is defined as a high-income or rich household.

## III. Model Specification

### A. Life-Cycle Model

As noted earlier, household operation expenditures can be disaggregated into - durable goods or furnishings -, and variable expenditures - utilities, insurance, *etc*. The nature of the durable goods in household consumption lends itself to multi-period analysis. In short the consumer can begin each successive period with an inventory of furniture or other durable household items. As a result, the decision on what to hold in inventory in the first period affects the expenditures in succeeding periods. The relevant utility function under this condition is therefore a multi-period one since the consuming unit may borrow and lend at market rates of interest without restriction and has a given stream of income (Cragg and Uhler, 1970).

**Figure 1:**




DeVoretz and Oszomer (1999) and others argue that a number of common variables condition the life-cycle consumption pattern of the household. These household variables include the head of household's age, age,$^2$ gender, marital status and the household's size, and disposable income or total expenditures and length of time in Canada for the foreign-born. They further note that the intercept of this function shifts due to latter set of variables (gender, *etc*) while the convex shape is owing to age and

length of time in Canada for the foreign-born. In sum, the life-cycle model with its core variables is the prime conditioner for household operations and furnishings expenditures with additional variables added in a particular setting (renters versus owners, or low income status).

The life-cycle model employed offers several hypotheses with respect to the included variables and I note these below.

1. Age $< 0$
2. Age$^2 > 0$
3. Income $> 0$
4. Family size $> 0$
5. Marital Status: relative to single $> 0$
6. Male, no prior

The sign of these variables can be easily rationalized. Given that a household has large initial fixed expenditures on household operations and furnishings, I would expect that with passage of time, or aging, the amount spent would decrease. Thus, the predicted signs for age and age$^2$ imply the decreasing expenditures at a decreasing rate. Higher income households will spend on shelter and thus on household operations. A larger household size through marriage or additional members will spend more on household operations and furnishings consumption, since more activities take place inside for these larger households. There is no prior on gender.

**B. Engel Curve**

One common method to summarize household expenditure behavior as a dependent variable is to formulate the expenditure behavior of a household in terms of its budget share devoted to an expenditure group. Given this share measure in turn an Engel curve can be defined which describes the relationship between a household's total

expenditure and its expenditure on a specific goods or services holding all prices constant. Following Working (1943) and Leser (1963) I propose to estimate semilog Engel curves as follows:

$$w_i = a_i + b_i * \ln x \quad (1),$$

where $w_i$ is the budget share of the commodity $i$, and x is total expenditure.

If $b_i < 0$, the good is defined as a necessity, i.e. its budget share decreases as the total expenditure increases. If $b_i > 0$, the good is defined as a luxury, i.e. its budget share increases with the total expenditure. Inferior goods are defined as those, whose absolute expenditure and budget share decrease as income increases. In a later version, this basic formulation is expanded to control the Engel curve estimates for the effect of demographic variables embedded in the life-cycle model.

## IV. Analysis of Results

This section provides a detailed account of the results and tests performed on the data set. I first report uncontrolled Engel elasticities to compare the Canadian and foreign-born groups' sensitivity to income changes on the expenditures for household operations. Next, I control the Engel elasticities for demographic variables derived from the life-cycle model and then test for the existence of differential effects owing to foreign-birth status once additional life-cycle features are controlled for.

### *A. Engel Elasticities*

Engel expenditure elasticities are calculated according to the following formula:

$$e_i = 1 + b_i / w_i \quad (3),$$

where $w_i$ is the mean share, and $b_i$ is the estimated coefficient of total expenditure by using equation (1).

Goods with an elasticity greater than one are luxuries, while those with an elasticity less than unity are termed necessities. In particular I seek differences in the order of magnitude for this measure across Canadian and several foreign-born groups to determine the impact of these groups on future expenditure patterns.

*Uncontrolled Engel Expenditure Elasticities*

A naïve comparison of the Canadian-born and foreign-born household's respective sensitivity to income changes on the demand for household operations and furnishings are represented by my uncontrolled measures. Given that the estimated β coefficients for household operations and furnishings expenditures are small negative numbers (reported in Table 3), the calculated expenditure elasticity is 0.7 for Canadian-born households and 0.74 for foreign-born households.

Thus, in this uncontrolled environment, household operations and furnishings expenditures can be classified in the aggregate as necessities. The household operations and furnishings are in fact income inelastic, with the foreign born slightly less inelastic. In sum, these uncontrolled measures report near equal elasticities for the two groups. However, controlling for demographic variables (as reported below) may alter this observation.

**Table 3: Engel Elasticity Estimates with No Demographic Controls**

| | **ALL** | | | | **OWNER** | | | |
|---|---|---|---|---|---|---|---|---|
| | Engel | Coef. | T-stat | R^2 adj. | Engel | Coef. | T-stat | R^2 adj. |
| ALL | **0.70** | -0.0332 | -54.54 | 0.094 | **0.51** | -0.0583 | -65.97 | 0.206 |
| Ca-born | **0.70** | -0.0338 | -49.05 | 0.092 | **0.49** | -0.0594 | -57.4 | 0.196 |
| IMMIGRANT | **0.74** | -0.0302 | -24.065 | 0.103 | **0.56** | -0.054 | -34.2 | 0.266 |
| US/W.E. | **0.73** | -0.0315 | -17.1 | 0.117 | **0.55** | -0.0567 | -24.4 | 0.298 |
| S&E. E | **0.67** | -0.0424 | -14.775 | 0.147 | **0.49** | -0.07 | -22.75 | 0.361 |
| ASIA | **0.84** | -0.0174 | -6.349 | 0.042 | **0.74** | -0.0282 | -7.5 | 0.09 |
| OTHER | **0.85** | -0.0152 | -5.3 | 0.038 | **0.84** | -0.0167 | -3.95 | 0.041 |
| | | | | | **RENTER** | | | |
| | | | | | **0.80** | -0.0207 | -26.2 | 0.054 |
| | | | | | **0.78** | -0.0223 | -25.6 | 0.061 |

| | | | | |
|---|---|---|---|---|
| | **0.88** | -0.013 | -6.97 | 0.025 |
| | **0.89** | -0.0118 | -4.53 | 0.024 |
| | **0.95** | -0.0056 | -1.15 | 0.001 |
| | **0.82** | -0.0181 | -4.03 | 0.044 |
| | **0.80** | -0.0203 | -4.6 | 0.056 |

**Table 4: Engel Elasticity Estimates with Demographic Controls**

| | **OWNERS** | | | **RENTERS** | | |
|---|---|---|---|---|---|---|
| | Engel E | Coef. | R^2 adj. | Engel E | Coef. | R^2 adj. |
| ALL | **0.41** | -0.0736 | 0.325 | **0.71** | -0.0261 | 0.121 |
| | | (t=-35.57) | | | -17.1 | |
| Ca-born | **0.38** | -0.0757 | 0.302 | **0.70** | -0.0272 | 0.128 |
| | | -32.1 | | | -16.8 | |
| IMMIGRANT | **0.54** | -0.0652 | 0.484 | **0.81** | -0.0168 | 0.091 |
| | | -16.53 | | | -3.56 | |
| US/W.E. | **0.54** | -0.0692 | 0.479 | **0.77** | -0.0186 | 0.144 |
| | | -10.28 | | | -2.74 | |
| S&E. E | **0.52** | -0.0736 | 0.548 | **1.14** | 0.0133 | 0.126 |
| | | -9.735 | | | 0.941 | |
| ASIA | **0.63** | -0.0474 | 0.36 | **0.69** | -0.0255 | 0.283 |
| | | -5.84 | | | -2.61 | |
| OTHER | **0.69** | -0.0335 | 0.257 | **0.62** | -0.038 | 0.18 |

*Engel Expenditure Elasticities Controlled for Demographics*

In order to test if household operation and furnishing expenditures are sensitive to life-cycle events, Engel elasticity estimates controlled for demographic variables are now reported. The particular demographic control variables include age, age$^2$, gender, marital status, number of rooms, change of dwellings and family size (reported in Table 4). The 'years in Canada' variable is also included in the foreign-born regression to measure any assimilation effect. The survey year is included to detect any period effect.

The expected pattern of results under these control variables are that the adjusted $R^2$ should rise if demographic variables are significant and, second, the Engel elasticity should rise or fall depending on the sign of the demographic variables. In fact, the adjusted $R^2$ value does rise dramatically for all groups when the controlled variables are included. I review the pattern of results in detail below.

The estimated coefficients are negative for the age variable (-.001) and positive for age$^2$ (1.2E-5). These paired values indicate the budget share for household operations and furnishings is convex in age. Time effect is greater for immigrant (0.2 percent less with 1 more year) than Canadian-born households (0.1 percent less). Negative signs for household income variable indicate that the greater household income, the smaller the budget share for either immigrant households (5 percent less with 1 percent more income) or Canadian-born households (4 percent less). Finally female-headed households have a larger budget shares than male-headed households, with this difference slightly greater for immigrants.

Given these results the calculated income elasticity measure for household operations is now lower after controlling for these demographic effects. The elasticity measure declines to a value of 0.6 (from0.7) for Canadian-born households and 0.67 (from 0.74) for the foreign-born households. In sum, both the controlled and uncontrolled elasticity estimates indicate a modest difference between the two aggregated groups of Canadian and foreign-born households. I now begin to disaggregate these two broad groups to detect more significant differences as implied by the stylized facts.

**B. Disaggregation and F-tests**

The existing meager immigrant expenditure literature and my reported stylized facts indicate that there exist significant differences when the population is disaggregated in several dimensions. Two obvious dimensions, foreign-birth status and income level are candidates for disaggregation.

My earlier review of the stylized facts indicated that on average, immigrant households spend $190 more than Canadian-born households on household operations in

my data set. In order to test if there in fact exists a structural difference in the household operations and furnishings-total expenditures relationship between Canadian and foreign-born headed households, I now run the following regressions and perform a F-test:

$$\ln(rHOF) = a + b\ln(rTOTEX) + \sum_{1}^{n} \Omega_n X_n + e \quad (4)$$

Where rHOF is real household operations and furnishings expenditures (in 1992 dollars),

rTOTEX is real household total expenditures (in 1992 dollars),

X is a vector of explanatory demographic variables, which include age, gender, marital status, family size, *etc*.

The null hypothesis is that the household operations and furnishings expenditures function is the same for the two kinds of households. The F-statistic derived from the regression results is 2.46, thus I reject the null at 1 percent level.

One of the central issues surrounding immigrant integration is their initial consumption patterns vis a vis the Canadian-born. Certain groups of immigrants (refugees, reunited family members) have experienced weak income performance upon arrival in the 1990s and thus a central question arises: “Do poor immigrant households household operation expenditure function differ from the general population?”

To begin this analysis I now turn to the recent literature on alternative Canadian poverty measures to test if households at risk, particularly the poor foreign-born, have different household operation expenditure functions.

Sarlo (2001) strongly suggests that poor households have different consumption patterns from rich households. Using Sarlo’s definition of a poor household, I perform two more F-tests. In order to test for the existence of a structural break in the household operations and furnishings - total expenditures relationship between poor and rich households, a second F-test is performed. The results are highly significant: the F-statistics I calculate is 30.88 and the p-value is almost zero. These values imply that the

household operation and furnishing expenditures functions in the two kinds of households – Sarlo poor and non-poor are significantly different.

Another F-test is performed to detect possible structural differences between poor immigrant households and the average income Canadian-born households. The null hypothesis that there is no structural break between these two groups is also rejected (with the F-statistics 12.56). This indicates that poor immigrant households behave differently than the average Canadian-born households.

In sum, my F-tests show that, in order to obtain the appropriate functional forms, I should run separate regressions for the Canadian and foreign-born households and for low and high-income households by birth status.

### C. Immigrants and Canadian Households Comparative Results

#### *1. Canadian-Born Vs. Foreign-Born Households*

Following the initial F–tests I run separate regressions for Canadian and foreign-born households under my full model controlling for the cited demographic and other household characteristics. The test results appear in Table 5 and for purposes of brevity I only report important pairwise differences.

**Table 5: Estimated Coefficients and T-statistics**

| | CB | | FB | | RichCB | | RichFB | | PoorCB | | PoorFB | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | B | t | B | t | B | t | B | t | B | t | B | t |
| (Constant) | 0.6741 | 6.3 | 0.7425 | 3.5 | 0.8935 | 8.4 | 0.6703 | 2.9 | -1.2430 | -3.3 | 1.7121 | 2.2 |
| LN totex | 0.6743 | 71.5 | 0.7045 | 39.6 | 0.6550 | 69.6 | 0.6983 | 35.4 | 0.7915 | 22.2 | 0.6177 | 8.5 |
| own-1, rent-0 | 0.4087 | 42.3 | 0.5207 | 24.0 | 0.3738 | 38.6 | 0.4762 | 21.5 | 0.7541 | 20.5 | 0.8300 | 11.9 |
| age | -0.0134 | -7.1 | -0.0252 | -5.6 | -0.0091 | -4.7 | -0.0167 | -3.6 | -0.0127 | -2.1 | -0.0531 | -4.0 |
| age square | 0.0001 | 6.4 | 0.0002 | 5.2 | 0.0001 | 4.0 | 0.0001 | 3.1 | 0.0001 | 1.8 | 0.0005 | 3.9 |
| gender | 0.1104 | 11.6 | 0.1113 | 5.2 | 0.0736 | 7.6 | 0.0772 | 3.5 | 0.3290 | 10.0 | 0.2306 | 3.4 |
| Married | 0.0076 | 0.6 | 0.0515 | 1.7 | 0.0280 | 2.1 | 0.0749 | 2.4 | 0.0188 | 0.4 | 0.0047 | 0.0 |
| Single | -0.1131 | -7.9 | -0.1274 | -3.7 | -0.0998 | -6.8 | -0.0812 | -2.2 | -0.1632 | -3.5 | -0.2302 | -2.2 |
| family size | 0.1236 | 8.4 | 0.0918 | 3.2 | 0.0975 | 6.5 | 0.0547 | 1.9 | 0.2941 | 5.7 | 0.2584 | 2.5 |
| family size^2 | -0.0126 | -6.0 | -0.0095 | -2.7 | -0.0098 | -4.6 | -0.0063 | -1.8 | -0.0344 | -4.7 | -0.0199 | -1.4 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| YRDUMY84 | 0.0838 | 7.0 | 0.1198 | 3.8 | 0.0743 | 6.2 | 0.1377 | 4.1 | 0.2275 | 4.4 | 0.0646 | 0.6 |
| YRDUMY86 | 0.0582 | 5.3 | 0.1108 | 3.6 | 0.0491 | 4.4 | 0.1166 | 3.6 | 0.2072 | 4.7 | 0.1357 | 1.5 |
| YRDUMY90 | 0.0230 | 1.9 | 0.0329 | 1.1 | -0.0072 | -0.6 | 0.0220 | 0.6 | 0.3079 | 6.9 | 0.2215 | 2.6 |
| workst | 0.0706 | 5.4 | 0.0797 | 2.7 | 0.0754 | 5.4 | 0.1184 | 3.7 | | | | |
| <lico | -0.0519 | -3.2 | | | | | | | | | | |
| real year in CA | | | -0.0104 | -3.6 | | | -0.0071 | -2.4 | | | | |
| Years$^2$ | | | 0.0001 | 2.6 | | | 0.0001 | 1.3 | | | | |
| cob2 | | | -0.0105 | -0.3 | | | | | | | -0.3308 | -3.2 |
| cob3 | | | -0.0060 | -0.2 | | | | | | | -0.2990 | -2.9 |
| cob4 | | | -0.0763 | -2.1 | | | | | | | -0.2541 | -2.4 |

First, the total expenditures elasticity is slightly greater for the foreign-born (0.70) than for Canadian-born households (0.67).

Next the variables which collectively represent the passage of time produce significantly differential effects on the household operation expenditure functions by birth status. For the foreign-born household the passage of a year reveals an assimilation effect (years in Canada variable) as well as a pure aging effect as the head of the households matures. In the Canadian-born case time contains only the pure aging effect. For the foreign-born households, one more year in Canada decreases their household operations and furnishings expenditures by 3.5 percent, but these household expenditures will only drop by 1.3 percent per year for Canadian headed households.

Other significant differences arise. Household size which measures the effect of an additional member regardless of age, has a greater effect on expenditures for Canadian-born headed households than on foreign-born. In fact, an additional member in a Canadian-born household will increase its household operations and furnishings expenditures by 11.1 percent, while for a foreign-born household, the increase for a similar reason is just 8.2 percent.

*2. Poor Foreign-Born households versus the average Canadian-born households*

I noted earlier that poverty, especially in the foreign-born, may prove to be a central policy issue. Motivated by my F-tests I now provide a series of regressions to detect the nature of the differences in the household operation expenditure functions between the poor, especially the foreign-born and the rest of the Canadian population.

Table 5 reports the parameter estimates for the various income classes and birth status groups. For purposes of brevity and interest I limit my discussion to one group – the low income foreign-born to detect significant differences vis-à-vis the three remaining groups. First I note a minor difference in the importance with total expenditures elasticity is slightly greater for the average Canadian-born (.67) than poor foreign-born households (.62).

Changes in household size yield significantly greater effect on poor foreign-born household's expenditures than average on the Canadian-born household's operations expenditures. In fact, with one additional member in the household, the household operation expenditures will increase by 11 percent for Canadian-born household, while a 24 percent increase occurs in the poor foreign-born household.

The gender effects are also greater in the poor foreign-born households than in Canadian-born households. Female-headed households spend 23 percent more than male headed households in the poor foreign-born household group, while the difference is only 11 percent for a comparable segmentation if they are Canadian-born households. Households with female head account for the majority of the poor group. If it is also an immigrant household, things are even worse.

The time effect is greater for poor foreign-born households. One more year in Canada leads to a 5.3 percent decrease in their household operations and furnishings expenditures. While the decrease is only 1.3 percent for the average Canadian households. The 'years in Canada' variable is not significant for poor foreign-born households, which indicates that there is no assimilation effect for these households.

### D. Disaggregation by Tenurial Status: Homeownership versus renting

It is possible that the difference in household expenditure arise as a by-product of the households tenurial status. In short, if renters owned their house then definitional distorations in the survey would be eliminated. In additions, changes in the renters in equity positions could affect their household operation expenditures. In fact, a typical homeowner's expenditure on household operations and furnishings is almost double that of renters, with a $2,500 difference (see Figure 2). I now perform an experiment to detect the source of this large difference. In short, does this difference arise because of differences in the endowments of renters versus homeowners or due to other effects? To test for the endowment effect I give renters the homeowners' endowments (income, age, *etc*) whilst keeping their own regression coefficients. Under this counterfactual experiment, though renters still spend less than homeowners, these differences decrease dramatically. This indicates that most of the original actual spending difference can be explained by differential endowments for the renters.

### E. Durable versus Variable Household Expenditures

To this point I have treated all household expenditures in a homogeneous manner. Clearly there exists an implied behavioral difference between expenditures on furnishings – a durable good and non-furnishing expenditures (telephone, hydro, etc.) which are variable in nature. Thus, I consider a series of experiments to detect differences in expenditure patterns by place of birth for these two broad categories of goods.

There exists a slight difference in the expenditure elasticities for the durable good or furnishings between Canadian-born households (1.4) and immigrant households (1.6). These values imply that furnishings are luxury goods for either group. On the other hand, since the income elasticity for household operations is 0.4 for Canadian-born households and 0.5 for foreign-born households, this indicates that variable household operations are a necessity.

**Figure 2:**

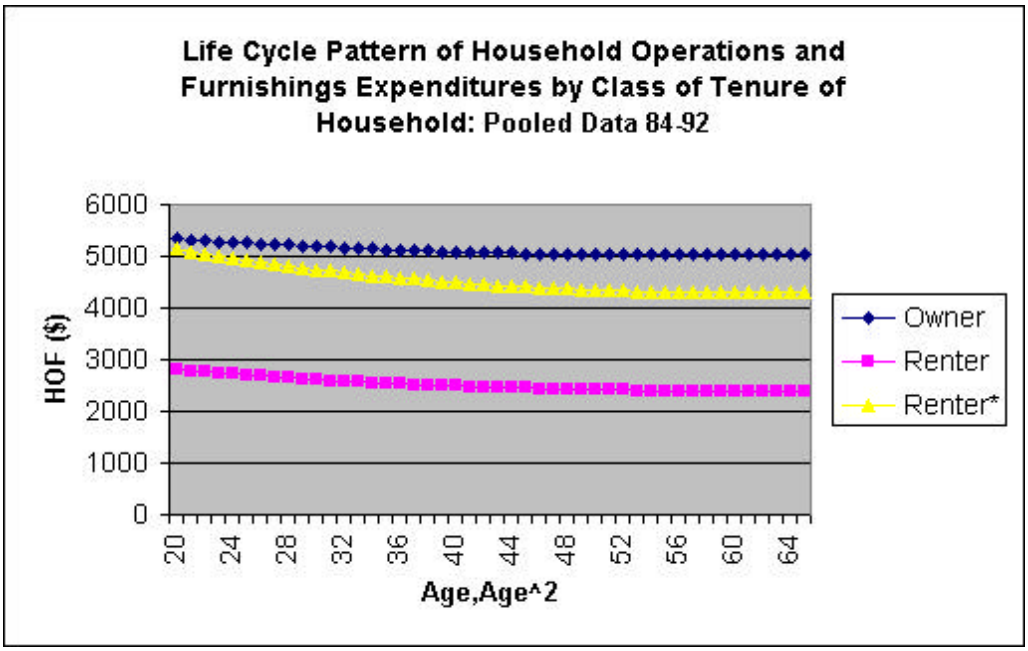
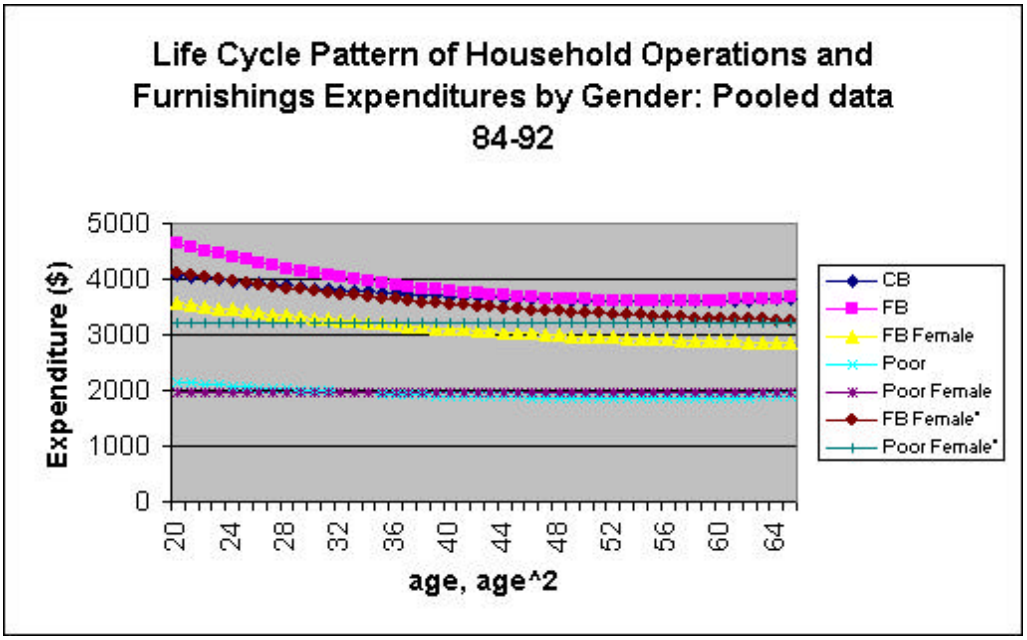



**Figure 3:**



Further disaggregation indicates that some subcategories of household operations and furnishings show a markedly different expenditure pattern between Canadian-born households and immigrant households and bear individual scrutiny. The most noteworthy difference appears in long distance toll charges with an average difference of $92 between the two types of households. I explore this interesting difference below.

*1. Long Distance Toll Charges*

New immigrants leave their home country to start a new life in Canada, often leaving family members and friends behind. Given this condition, structural differences should arise in communication expenses. The following model is used to explain the variation on long distance phone call expenditures by birth status:

$$\ln(rholdtc) = a + b\,\ln(rtotex) + \sum_{1}^{n} \Omega_n X_n + e \quad (6),$$

Where rholdtc is real household long distance toll charges (in 1992 dollars),

X is a vector of explanatory demographic variables, which include age, gender, marital status, family size, class of tenure, number of rooms, value of owned house, occupation and, most importantly, an immigrant dummy is included.

The crucial coefficient of immigrant dummy variable is 0.372. This suggests that with everything else being equal, immigrant households spend 45 percent more on long distance phone calls than Canadian-born households.

In addition, when I control for the standard variables, the regression results indicate that immigrant households from different country origins reveal different patterns for long distance call expenditures. When using immigrants from United States or western Europe as the base group, people from southern and eastern Europe spend 35 percent less, while people from Asia spend 25 percent less on long distance calls.

*2. Insurance*

I noted earlier that some definitional problems appear in my data set. In particular, differences in homeowner insurance expenditures may arise because of contractual mortgage obligations. In short, if you have a mortgage then your lender will require insurance. For homeowners without a mortgage this expenditure is voluntary.

I now ask, will the structure of demand for insurance differ if I disaggregate by tenure status – mortgage free or not, and by foreign-born birth status?

To answer this question, consider the following model,

$$\ln(rship) = a + b\,\ln(rtotex) + \sum_{1}^{n} \Omega_n X_n + e \qquad (5),$$

Where rship is real homeowner insurance premium expenditures (in 1992 dollars),

X is a vector of explanatory demographic variables, which include age, gender, marital status, class of tenure, number of rooms, *etc*.

Table 6 indicates that a structural difference appears in the insurance demand equation between Canadian-born and foreign-born households[4]. For immigrant households, many variables do not influence insurance expenditures, such as their age, marital status, employment status, while these variables are significant conditioner in the Canadian born household demand equation. On the other hand, gender does not influence Canadian-born results, while it is a significant conditioner in the foreign-born results. In fact a foreign-born female-headed household spends 12.6 percent less than foreign male-headed household.

[4] Note that in this experiment I do not control for mortgage status but include all households.

**Table 6: Insurance Demand Equation**

| | CB | | FB | |
|---|---|---|---|---|
| | B | Sig. | B | Sig. |
| (Constant) | 1.861364 | 5.27E-12 | 2.039773 | 2.39E-06 |
| LN totex | 0.274996 | 2.02E-23 | 0.241475 | 1.63E-09 |
| age | 0.023428 | 5.85E-06 | | |
| age square | -0.00027 | 3.28E-07 | | |
| marst | 0.101687 | 0.000166 | | |
| family size | -0.04621 | 1.76E-06 | | |
| clten | -0.05915 | 0.008379 | | |
| workst | 0.092154 | 0.006066 | | |
| unemployment insurance | -0.0578 | 0.022117 | | |
| <lico | -0.21543 | 2.5E-05 | | |
| yeardummy84 | 0.129171 | 1.48E-06 | 0.203264 | 0.000229 |
| yeardummy86 | 0.062683 | 0.00818 | 0.143586 | 0.003873 |
| numrm | 0.037025 | 1.97E-08 | 0.069188 | 5.08E-08 |
| value of owned house | 1.61E-06 | 1.69E-22 | 2.11E-06 | 3.59E-17 |
| gender | | | **-0.13512** | 0.006192 |
| real year in CA | | | 0.019842 | 0.005844 |
| real year in CA square | | | -0.00026 | 0.046458 |
| cob3 | | | 0.139571 | 0.001604 |

Finally, and most crucially the dummy variable which controls for mortgage holding status of a homeowner indicates significant differences. A Canadian born household, owner with a mortgage spends 5.7 percent less than Canadian owners without a mortgage. The dummy variable for the foreign-born household with or without mortgage is not significant.

In sum, it appears that once Canadian homeowners are mortgage free, they value their equity and are risk averse and spend more on insurance.

### F. Female Headed Households

Canadian households are potentially at risk when their heads are new immigrants and female. In fact, Arti (2000) notes the earnings of female immigrants are lower than other groups in Canada. For my FAMEX data, male-headed households earn on average a total income of $52,202 per year, while female-headed households earn only $34,268 in annual income. The double jeopardy nature of the problem is revealed when I further note that in my data set that a female-headed immigrant household's total income is only $33,746 on average.

When I focus specially on household operation expenditures I note that foreign-born female headed households spend about $1,000 less on household operations and furnishings than the average immigrant households (see Figure 3) and $810 less than the average Canadian households. I now ask does this expenditure difference arise because foreign-born females have lower incomes or because of their gender?[5]

All my test results (except for the Canadian-born' home insurance) show a significant positive coefficient for the gender dummy variable (1 for male, and 2 for female). With everything else equal, a female-headed household spends 11 percent more on household operations and furnishings than male headed households. In turn, if I perform an experiment and maintain the foreign-born female household's demand equation and give them a male households' income, the household operations consumption of the female-headed household would increase by 23 percent. Hence, the raw data difference in expenditures arises from an endowment effect.

My test results indicate that there is no significant difference between low-income households and low-income female households. This may be explained by the fact that more than 63 percent of poor households are female headed.

## V. Summary and Conclusions

This study compared patterns of household operations and furnishings expenditures for immigrants and non-immigrants and several other categories. My key findings are as follows.

(1) While there is some variation in the consumption of some goods and services in this category across different groups, the general level is similar. The average household operations and furnishings consumption is a big share of total consumption (more than 11 percent).

(2) Immigrants spend more on household operations and furnishings than Canadian-born households on average. However, one additional year in Canada has greater negative effect on foreign-born than on Canadian-born households, thus immigrants converge to Canadian-born households level over time.

(3) There exist greater time and gender effects on expenditure for poor foreign-born households than on average Canadian-born households. In addition, household size has a greater effect on poor foreign-born households' expenditures as well.

(4) With everything else equal, a female-headed household spends 11 percent more on household operations and furnishings than male headed households. This might be explained by their different tastes or preferences.

(5) With everything else being equal, immigrant households spend 45 percent more on long distance phone calls than Canadian-born households. In addition, immigrants from United States and Western Europe spend the most in this subcategory.

(6) A Canadian-born household, owner without a mortgage spends 5.7 percent more than Canadian owners with a mortgage on home insurance.

(7) Our disaggregated analysis by tenure and product type revealed greater differences than appear in the aggregate. For example, household operations and furnishings are income inelastic as a whole, but for furnishings alone, it is income elastic.

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[5] If the gender effect is dominant I am implicitly arguing that this is owing to an unobservable factor, perhaps tastes which are hidden in the gender variable.

Moreover, immigrants spend significantly more on furnishings and long distance calls than Canadian-born households.

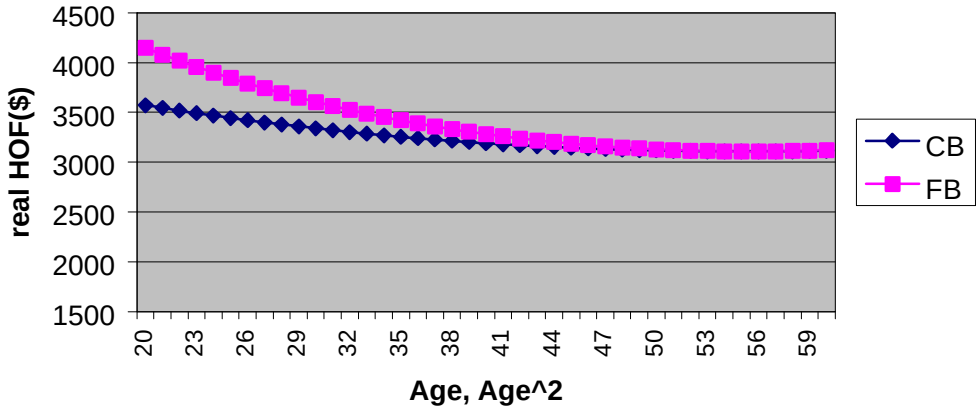
(8) In addition, renters spend significantly different on household operations than homeowners. This difference arises because the average income of renters is much lower than homeowners, and on average, homeowners are 6 years older than renters.

Our analysis of immigrants at risk illustrates important differences and lead to some policy implications.

In order to reach some conclusion about the important issue of convergence of expenditure patterns overtime I now offer some simulation experiments based upon the reported results. The simulation technique is straight forward and involves estimating the expenditure level for a chosen household by plugging in the average variables for all non-time related variables in the relevant household equation and maintaining their estimated coefficients in the equation. The simulation consists of aging the household. In particular the aging effect for the Canadian-born household measures the marginal effect of the age and age squared variables, whilst for the foreign-born the additional effect derived from ‘years in Canada’ and ‘years in Canada’ squared are incorporated as each year passes. My initial simulation is reported in Figure 4 and was constructed as follows.

The parameter estimates and mean values for the relevant variables of model (4) are inserted in the Canadian-born and immigrant households’ demand functions respectively. In this simulation as years in Canada increase for foreign-born households (which is a combination of aging and assimilation), expenditures for these households assume a convex shape over time. This implies that the initial higher foreign-born expenditure gradually converge to the Canadian-born value of $3,100.

**Figure 4: Life Cycle Pattern of Household Operations and Furnishings Expenditures by Age of Household Head: Pooled data 84-92**




Canadian households expenditure paths also consume a convex shape in age over their life cycle (20 to 65 years old). As already noted after the age of 50, both households spend almost the same amount on household operations. My disaggregated findings lend themselves to a series of policy-oriented simulations. I produce these below.

Given my findings that poor immigrant households spend significantly less on household operations I now perform a simulation to measure how much income "catch-up" would be involved to equalize their household operation expenditures between a representative poor household and an average Canadian-born household. In short I ask: How much of an increase in total income (or total expenditures) would be required to ensure that a proto-typical poor immigrant household would spend the same amount on household operations and furnishings as a representative Canadian household would?

For purposes of this policy experiment I construct two relevant representative households-A and B. Both households are male headed renters, age 35, married with a family size of 2.6 (the average family size for my data set). Household A however, is headed by an average Canadian with an income of $38,775, and given my stylized facts the consumption of the Canadian-born household on operations and furnishings is predicted to be $3,445 per year. Household B is headed by a poor immigrant (with an

income of $16,686), and the expenditure on household operations and furnishings is estimated to be $2,253, or $1,192 lower than household A.

Now even if household B is given the same income as A, B's household operations and furnishings expenditures will only increase to $3,127, still leaving a $318 difference. However recent evidence suggests that poor immigrant households will never "catch up" to the Canadian income norm. This implies that if a policy goal was to equalize household expenditures owing to differences in endowments for our proto-typical poor immigrant households, only an $874 subsidy would be required or 73 percent of the original observed difference.

Clearly my results can be extended in many directions by changing the attributes of the proto-typical households under simulation. Given that I found that female immigrant headed households face a double jeopardy, I now provide a simulation below to explore that issue.

Two representative households-C and D-are picked, both female headed, age 35, married with family size 2.6. C is a representative Canadian born household, its consumption on household operations and furnishings under these conditions is predicted to be $3,928 per year. D is a representative immigrant household, with a one-year residence in Canada and income of $13,940 which is below the LICO. Its consumption is estimated to be $2,586, or $1,342 lower than C the average Canadian-born headed household.

When I give D the same income as C, D's household operations and furnishings expenditures will increase to $3,624, only $304 lower than C. Thus 77 percent of the different expenditure can be explained by their different income endowment, while remaining 23 percent difference is due to taste differences. If we allow the labor market to eradicate the total expenditure difference the female immigrant headed household would need $24,195 in added income to yield the same expenditures on household operations and furnishings as the average Canadian-born female head household. It may never occur and clearly granting an initial $1,038 annual subsidy for household operations and furnishings consumption purposes would be a faster equalization tool.

In summary, this paper illustrates that convergence in household operations between representative foreign-born and Canadian-born households is expected. However, for poor and/or female headed foreign-born households convergence is not possible over their lifetime if we only rely on market forces to generate income to eradicate expenditure differences.

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