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Immigrants and the Demand for Shelter

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Immigrants and the Demand for Shelter

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Abstract: This paper investigates homeownership and housing expenditure patterns of Canadian and foreign-born-headed households. A two-stage Heckman estimation technique is used to measure shelter demand of owners and renters. According to the decomposition analysis, factors other than differential income levels explain the bulk of the difference between Canadian- and foreign-born shelter expenditures. On average immigrant households are able to assimilate into homeownership and spend more on shelter than representative Canadian households. However, low-income immigrant renters might be at risk in the housing market, as their housing expenditures are below representative Canadian-born households' expenditures. Thus, foreign-born households in general do not need subsidies for housing, but specific subsidy programs could target some immigrant households in critical income brackets and specific locations.

Key Words: Canada, demand, housing consumption patterns, hedonic estimation of prices, homeownership, permanent income, 2-stage Heckman estimation, price and income elasticities, decomposition analysis, endowment effect.

INTRODUCTION

Shelter expenditures are of paramount importance for immigrant households upon their arrival in Canada and afterwards. In fact, over 17 per cent of the average Canadian household's total expenditure (including personal taxes) is spent on shelter (circa 1996).[1] Thus, shelter is the largest single expenditure category for all Canadian households. In fact, if we add household operations to furnishings and shelter expenditures, the total constitutes over a third of Canadian household expenditures (netted for personal taxes). The immigrant budget share devoted to these expenditures is of an even greater magnitude (Wang 2001, Skaburskis 1997). While the extant literature discusses in depth differential rates of homeownership between Canadian and foreign-born households, very little attention has been devoted to their actual patterns of absolute and relative expenditures on shelter. This econometric analysis of cross-sectional data will fill in this gap in the literature.

A detailed analysis of housing expenditures by Canadian-born and foreign-born households will further allow me to answer a number of unique questions about immigrant behavior. First, how sensitive is immigrant demand for shelter to their income levels and changes in shelter prices? Next, do immigrants' spending patterns on shelter differ from those of the Canadian-born? If there exists a difference, is there a convergence to the Canadian norm over time? In addition, how do households' demographic and economic factors affect the demand for immigrant housing? What roles do differential tastes versus other barriers play in the choice of housing and the ultimate expenditure level of immigrants? Moreover, what immigrant groups are at risk in the housing market? What factors have led to this risk – discrimination, tastes or a lack of immigrant household resources? Given these risks, what, if any, remedial policy measures exist to equalize expenditure patterns of immigrants and the Canadian-born?

LITERATURE REVIEW

Homeownership and Immigration

In recent years economists have become increasingly interested in the assimilation of immigrants into the housing market of their host country (Layrea 1999; Hayfron 2000; Lewin-Epstein and

[1] Family Expenditure Survey 1996.

Semyonov 1999; Myers, Megbolugbe and Lee 1998).[2] The general findings are that immigrants start at low levels of homeownership, but quickly achieve higher ownership levels and eventually catch up to the native born. The rationale behind this assimilation pattern is obvious. Immigrants enter the host country with a lack of the language skills and little knowledge of the housing market, and possibly with a liquidity constraint. However, with time in the new country they achieve the necessary language proficiency and gain knowledge of the housing market while accumulating enough wealth for a down payment for their new home. Thus, the literature argues that immigrant homeownership acquisition is one of the key indicators of their rate of assimilation into the Canadian economy. In addition, others note that the purchase of a home by a foreign-born household is a further sign of their psychological commitment to the new community and an indicator of their willingness to remain in the host country.

It has been further pointed out in the literature that differential patterns of homeownership by foreign and native born could result from different tastes and the distinct period of immigrant arrival. In particular, a house is not only a consumption good but also an asset, and people from different cultures might vary in their attitudes towards homeownership. Indeed, Shamsuddin and DeVoretz (1998) find that immigrant wealth accumulation and asset holdings differ from those of the Canadian born, including homeownership. At the same time people immigrating during a certain period may be "launched" into a particular homeownership pattern due to specific housing policies and economic conditions (e.g. interest rates, rents vs. housing prices, subsidy programs etc.) upon arrival (Lewin-Epstein and Semyonov 1999).

Canadian Public Policy Issues

Canada has a long history of extensive public policy intervention at the federal and provincial levels of government to address perceived problems in the housing sector. Foremost issues in the policy debate are the affordability of housing, gender and immigrant access to housing. Miron (1995) provides a historical perspective on the issues of affordability for homeownership choice and notes the growing importance of housing expenditures as a share in household budgets in the recent decades.

Skaburskis (1997) examines Canadian groups at risk in the housing sector. He tests for the effects of gender and foreign-birth status on tenure choice and housing expenditures in Vancouver and Toronto. The author observes that immigrants spend a greater share of their

[2] This assimilation-based research in the housing market is built on convergence models proposed by labour economists (Chiswick 1978, Borjas 1985, etc.).

budget on rental housing: the average Canadian rent to income ratio was 24.14 percent in 1990 and over 30 percent for recent immigrants (Toronto and Vancouver). In sum, Skaburskis' work indicates that immigration could be an important force in shaping Canadian urban housing demand.

After 1986 the Canadian shelter literature begins to address the possibility that substantial inflows of affluent immigrants could significantly influence the demand for housing and housing prices. In particular, the literature addresses the growing concern that immigrants have raised the market price for owner-occupied houses in large metropolitan areas. The early evidence proved ambiguous with respect to this hypothesis. Baxter (1990) and Schwaan (1990) concluded that immigration played only a moderate role in the demand for housing in Greater Vancouver over the 1970–1990 period. In particular, Baxter (1990) has investigated the relationship between population change and the demand for housing in metropolitan Vancouver over the 1951–1986 period. He considers the role of natural population increase,[3] an aging population, the rate of household formation and migration into the Vancouver region as conditions for housing demand. He concludes that the aging process of the post-war baby-boomers and not immigration was the leading factor in determining changes in housing demand in metropolitan Vancouver. Miyake (1992) however, argues that there is a significant link between immigration and housing prices. The same conclusion is suggested by Ley and Tutchener (1999) who comment on the strong correlation between housing prices and immigration, especially in Vancouver. They conclude that conventional regional and national factors seem to have declining significance in accounting for price movements, while indicators of globalization, including immigration, have stronger effects, particularly in Vancouver.

As alluded to earlier, numerous studies have focused on the differential homeownership attainment patterns of the Canadian population (Layrea 1999, Skaburskis 1996, Ray and Moore 1991, Balakrishnan and Wu 1992). These studies find differential patterns of ascension to homeownership between households of different origins. African/Caribbean immigrants have the lowest probability of homeownership across Canada. In Vancouver, Asian immigrants have the highest probability of home ownership. Layrea finds that in general it takes immigrants 6 to 8 years to catch up to the homeownership patterns of the host population on average, although some immigrant groups seem to never catch up (Layrea 1999).

To date the literature has not addressed the crucial analytical concept of income and price elasticity estimates for shelter for the foreign-born and Canadian-born. My estimated income and

[3] Increase in population by new births.

price elasticities, which form the centerpiece of this paper, will allow me to forecast immigrant housing expenditures given changes in their incomes and prices over a household life cycle. In this manner I will address the relevant influence of immigration on the demand for Canadian housing.

Income and Price Elasticity Estimates of Previous Demand Studies: Why Is It Important?

Mayo (1981) has conducted an extensive review of housing demand studies written in the seventies and provides a historical perspective and comparison of these reported price and income elasticities.[4] Among the log-linear models, the permanent income elasticities fall mostly in the 0.3 to 0.5 range for renters and 0.5–0.7 range for owners. According to Mayo, the smaller estimates reflect a major [downward] bias because current household income was used as a regressor and not a permanent income measure. Mayo also reports a wide range of price elasticity estimates. Most of the reviewed estimates indicate clearly that the demand for housing is on average price inelastic (less than unity).

More recent housing demand studies are summarized with their elasticity estimates in Table 1A (see Appendix A). The income elasticity estimates for owners range from 0.05 to 1.26 with most values lying between 0.3 and 0.8. The income elasticity estimates of renters range from 0.08 to 1.5 with most falling into the 0.2–0.5 range. I note below how sensitive these elasticity estimates are to different estimation techniques and data samples.

In most cases the demand for shelter is income inelastic, thus it is a necessity.[5] Moreover, in all studies but one, the income elasticity estimates for owners exceeds those of renters. As suggested by Mayo, most discrepancies in elasticity estimates result from the use of an incorrect income variable. Reported income elasticities based on current income are much lower that those based on a permanent income measure (Lapointe and Moisan 1984). However, elasticity estimates are even greater when net current wealth is used as a proxy for income (Lapointe and Moisan 1984, Jones 1990). In addition, the literature indicates that location as well as stages in the life cycle also affect shelter elasticity estimates. In fact, youthful but wealthy homeowners' income elasticity indicates that they treat housing much less as a necessity than others (Jones

[4] Income and price elasticities measure the responsiveness of housing demand with respect to changes in income and prices. The income elasticity is equal to the ratio of the percentage change in housing expenditures and the corresponding precentage change in income, and price elasticity equals the ratio of the percentage change in housing expenditures and percentage change in price.

[5] A necessity as opposed to a luxury is a commodity, which responds slightly to changes in income (its income elasticity is less than unity by definition).

1990). In addition Jones (1990) found substantial income elasticity differences across Canada (Québec vs. Ontario owners).

Finally, the literature on housing tenure and demand has paid special attention to shelter demand of recent movers. This branch of the literature is obviously crucial to my analysis and I report some of the unique problems of estimating shelter demand for recent movers. The rationale behind using this restricted sample is that "their decisions are more likely to reflect equilibrium conditions in the housing market" (Painter 2000, p. 198). This approach is criticized for ignoring the long-term nature of homeownership decisions. An alternative approach is to use a sample of recent movers but account for the probability of being a mover. Empirical evidence suggests that when the probability of moving is incorporated into the model, some variables, such as age of the head of household and immigrant status, lose their significance in the tenure choice model (Painter 2000).

However, a bias could occur when using a sample of recent movers if this group does not represent the households in general or "if the same exogenous influence on demand also influence[d] the decision to move" (Harmon and Potepan 1988: 460). Harmon and Potepan conclude that while [recent mover] sample selection bias may be a theoretical concern, "as a practical matter its presence may not seriously affect housing income elasticity estimates" (Harmon and Potepan 1988: 576).

Research on Ethnic Differences in Housing Demand

Finally, there exists an extensive body of research on racial and ethnic differences in housing demand and homeownership patterns outside of Canada. These reported differential patterns of housing demand and homeownership (primarily in the United States) have been explained by different endowments of the population cohorts studied and other residual effects such as institutional and structural factors intrinsic to the housing market (residential segregation, discriminatory practices, etc.), as well as other omitted variables correlated with race or ethnicity (wealth, employment history, credit history and tastes) (Megbolugbe and Cho 1996 – US; Bourassa 2000 – New Zealand). I will use this literature when analyzing households at risk and explain the differential patterns of shelter consumption between Canadian-born and immigrant-born households.

In sum, this literature review points to important features to incorporate in my model or later to explicitly test for their effect. First, permanent income and prices, as well as temporal variables, which capture the period, immigrant entry and assimilation effects, must be

incorporated in my demand model. Next, past mobility experience (recent movers) and household structure must be present in my shelter demand equations.

DATA AND DEFINITIONS

My data set consists of cross-sectional data drawn from different survey years. The data were obtained from the Family Expenditure Surveys (FAMEX) for the years 1984, 1986, 1990, 1992 and 1996. These surveys are based on extensive interviews[6] conducted with respondents in households, with each reporting expenditures on different items and associated household characteristics.

FAMEX defines a *household* as a person or a group of persons occupying one dwelling unit. Moreover, FAMEX defines the reference person (head of the household) as the person responsible for filling out the questionnaire. In case of multimember households, I redefine the reference person as the spouse who earns the most income. If the head of the household was born in a foreign country,[7] that household is then classified as an *immigrant household*.[8]

For a variety of reasons the raw data set must be filtered in order to yield a more homogeneous sample.[9] In particular, households residing in non-urban areas are excluded from my sample. The final size of the pooled sample (1984, 1986, 1990 and 1992 years) is 20,337 observations.

Descriptive Statistics

In order to better conceptualize the model, which follows, and provide the readers with context I now report some sample statistics. On average renters spend more of their income on housing than owners do (27 vs. 17 percent of total current consumption[10]). Thus, my first observation is that the household's tenure arrangement is important in determining its average expenditure share for housing.

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[6] "The collection of expenditures by recall and reference to records for the previous year imposes a considerable task on both the interviewer and the respondent, necessitating lengthy interviews and frequently more than one visit on order to obtain complete information." (FAMEX Codebook, p. 192)

[7] Only immigrants that arrived to Canada at a minimum of 15 years of age are included.

[8] A narrower definition of *an immigrant household* will be used for comparison: both spouses are immigrants.

[9] See appendix B for details.

[10] According to FAMEX, *total current consumption* includes expenditures on food, shelter, household operation, household furnishings and equipment, clothing, personal care, health care, transportation, recreation, tobacco and alcohol, reading materials, education and miscellaneous expenses.

Table 1 presents a comparison of the distribution of Canadian-born and immigrant-born households across different tenurial classes. There I have cross-classified my sample by birth and tenure status to detect disaggregation strategies when I later estimate my model. Several patterns emerge. Canadian-born households are roughly equally distributed across the three main tenure arrangements (owning without a mortgage, owning with a mortgage, and renting).[11] Immigrant households from Europe and the US have a higher propensity to own without a mortgage, and immigrant households from "other" countries tend more to rent. In general, immigrant households ("broad" definition[12]) have a slightly greater tendency to rent. When a more restrictive definition of the immigrant household[13] is used, more pronounced differences across the three tenure arrangements can be observed. In fact, when a foreign-born household is narrowly defined as a household with both spouses being immigrants, it has a higher propensity to own.

Table 1: Percentages of Households of Different Origins in Various Classes of Tenure (1996 FAMEX)

	Owner w/out mortgage	Owner with mortgage	Tenants - regular, free roomers	Mixed tenure, owned in 96
Canadian-born households	31.6	31.9	33.5	3
Immigrant head of household	34.9	27.6	34.9	2.6
Both spouses - immigrants	40.4	32.7	24.1	2.7
COB[14]: US, N & W Europe	39.7	27.7	30.4	2.2
COB: S & E Europe	51.9	20	26.9	1.2
COB: Asia	26.3	39.6	30	4.2
COB: Other	12.2	19.3	65.1	3.4

Source: Tables 1 and 2 are calculated by author from FAMEX 1996.

The influence of other demographic and socio-economic characteristics is illustrated in Table 1C (in Appendix C1), which presents frequencies of homeownership across various cohorts of households. Residents of Québec have the lowest propensity to own. Most rural residents are homeowners. Age, income, household size, and education have a positive influence on homeownership. [15]

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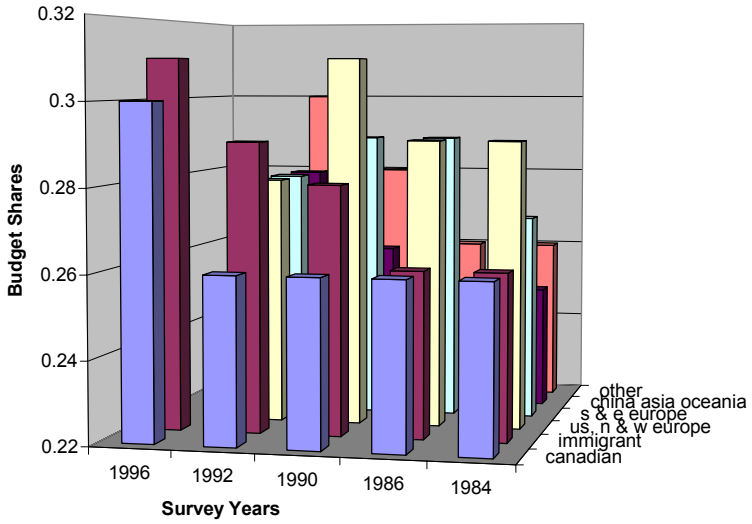
[11] Observations with mixed class of tenure are filtered from my sample.
[12] The reference person is an immigrant.
[13] A narrower definition of *an immigrant household* is used for comparison: both spouses are immigrants.
[14] COB: country of birth in 1996 FAMEX.
[15] These findings are similar to those of Sam Layrea (1999) who analyses homeownership patterns in Toronto, Montreal and Vancouver CMA's based on 1991 census.

Given the finding that tenure status varies across several dimensions for the entire population I now pursue a different tact. I would like to demonstrate through a series of graphical representations that shelter expenditure patterns for the foreign-born vary by year of entry and country of origin. If this is true this will in turn inform my later estimates. Figure 1 presents[16] a comparison of rental shares[17] as a percentage of total current consumption (for renters only) by survey year and country of birth of the head of the household.

Figure 1: Mean Consumption Shares of Rental Housing Expenditures by Year and Origin



Variations do appear over the 1984–1996 period: the budget share on rental housing for an average immigrant household has gradually increased from 26 to 31 percent. The budget share for an average Canadian household has risen from 26 to 30 percent over a much shorter period: 1992–1996. Another interesting observation is that over the 1984–1990 period immigrant households from the US and Europe spent more on rental housing as a share of their total current consumption than did average immigrant households from Asia and other countries. However, the trend reversed in 1992 when immigrants from countries other than the US, Europe and Asia spent the largest share of their total current consumption on rental housing. These findings indicate that my rental analysis must be disaggregated by entry cohort and origin.

[16] Figures 1 and 2 are calculated by author from 1984, 1986, 1990, 1992 and 1992 FAMEX's.

[17] Expenditures on rented living quarters include rent, tenants' maintenance, repairs and alterations, and insurance premiums.

Figure 2: Mean Consumption Shares of Owner Housing Expenditures (Sample of Owners with Mortgage) **by Year and Origin**

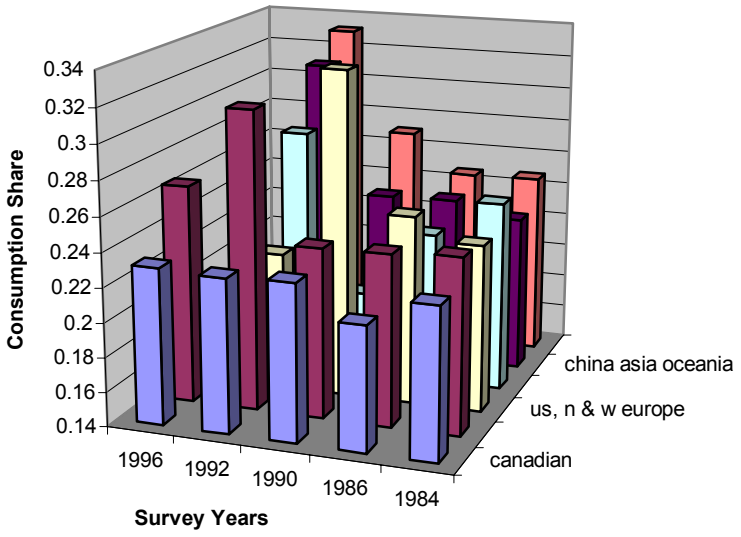


Figure 2 presents average consumption shares of owned living quarter expenditures[18] (for owners with mortgage only[19]) by survey year and country of birth of the head of the household. Similar to rental shares, average expenditure shares for owned living quarters are the highest for immigrant households. While the immigrant mean consumption share on owner housing increased after 1984, the owner housing consumption share of the Canadian born has remained relatively stable (22%). Similar to average consumption shares on rental housing, one can observe an upward trend in housing shares of immigrant owners from "other" countries.

Figures 3 through 10 in Appendix C2[20] present an uncontrolled analysis of the influence of different socio-economic and demographic factors on the relative and absolute[21] housing consumption by immigrant and non-immigrant households. One important observation is that across all the considered household groupings by income, education, family size or gender of the head, the immigrant households spend a greater share of their budget on housing.[22] Table 2

[18] Expenditures on owned living quarters include maintenance and repairs and replacement of equipment condominium charges, property taxes, homeowner's insurance premium and mortgage interest.

[19] Expenditures of mortgage holders include their interest payments and, thus, are different from expenditures of non-mortgagers. In my demand analysis, the opportunity cost of equity will be included into owners' expenditures to account for these differential equity positions.

[20] Figures 3 through 12 are calculated by author from 1996 FAMEX.

[21] Relative: consumption share; absolute: value and rent.

[22] This is not always the case when a narrower definition of an immigrant household is used: both spouses are immigrants.

presents a more concise summary of the direction of influence of the reviewed socio-demographic factors on relative and absolute consumption for shelter in Canada.

As has been mentioned above, immigrant shelter consumption might vary by date of arrival, since their shelter consumption could be influenced by extant housing and immigration policies, as well as the period's economic conditions upon arrival. Time also enters into the shelter decision in a second dimension. Immigrant households' shelter consumption patterns may differ by their length of stay in Canada. As noted by an economic historian four decades ago (Kelley 1969: 115), "the most reasonable hypothesis would suggest that [a…] migrant takes with him the behavioral response of his previous environment." Thus, given this initial taste difference it could be argued that immigrants' shelter consumption may converge to the Canadian norm as their length of stay in Canada increases.

Unfortunately my analysis of these two time effects on shelter consumption is limited by my data set. With only four survey years, immigration cohort and years since migration variables are highly collinear.[23] Even given this difficulty, it is apparent, however, from Figures 11 and 12 that more recent immigrant cohorts spent a smaller share of their budget on rental housing and a larger share on owner housing. This observation is crucial since it argues that estimates of shelter demand for the foreign born must be disaggregated across time and space.

[23] Year since migration was calculated on the basis of immigration cohort variable. YSM= survey year – year of immigrant arrival.

Figure 11: Expenditures on Owned Living Quarters as Shares of Total Consumption
(sample of owners with mortgage)

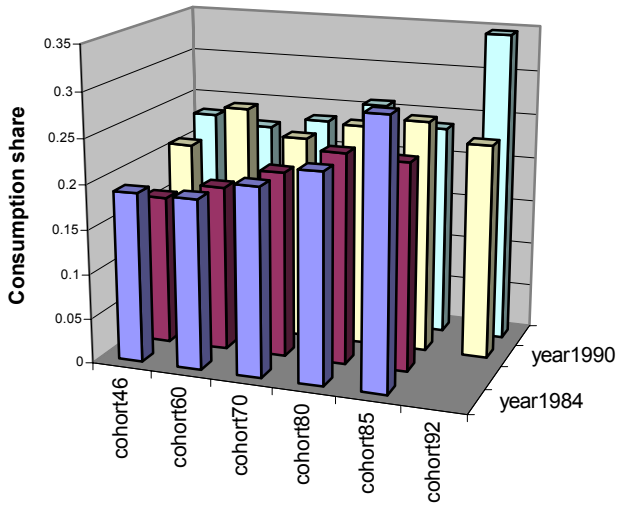


Figure 12: Mean Rental Housing Consumption Shares by Survey Year and Immigration Period Cohort

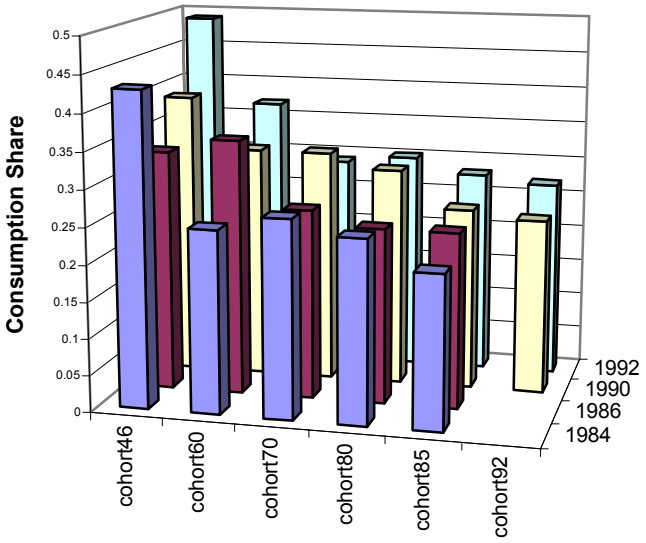


Table 2: Presumed Influence of Reviewed Variables on Demand for Shelter (1996 FAMEX data)

Variables	*Owner share*	*Rental share*	*Rent*	*Value of dwelling*
Age of head of household	Negative (before retirement)	Positive	Concave in age (peaking at 40-44 years old)	Concave in age (peaking at 45-49 years old)
Income	Negative	Negative	Positive	Positive influence for Canadian-born, convex in income for immigrant
Education	Negative	Negative	Positive	Positive for Canadian h-holds, possibly concave for immigrant h-holds
Male head	Negative	Negative	Positive	Negative for immigrant, positive for Canadian-born
Family size	Possibly negative	Negative	Increasing for immigrant, concave for Canadian	Slightly increasing in family size (not consistently)
Years in Canada	Negative	Positive	-	-

In short, demographic and socio-economic factors, as well as period of immigration and years since migration are important determinants of the tenure choice and demand for shelter. They will be incorporated into my econometric model when I estimate the demand for shelter. Further, both the reviewed literature and the descriptive data call for a two-stage analysis. First, the households must choose between renting and owning. Thus, age, gender and education level of the head of the household, as well as household income, household composition and region of residence will be used as regressors in the first stage: in the tenure choice estimating equation. The independent variables in the second stage or the demand equations will include age and gender of the head of the household, income and other household characteristics. Price variables will be incorporated in the tenure choice and housing demand equations to reflect the importance of regional and temporal variations in prices.

EMPIRICAL RESULTS

My econometric model of housing demand is constructed according to methodology developed by Lee and Trost (1977), Goodman (1988), Rosenthal (1989), Bourassa (2000) and others. In general this technique involves estimating a two-stage housing demand equation with demographic and socio-economic characteristics of households as explanatory variables.

The remainder of my paper is organized as follows. The first section (HEDONIC PRICE ESTIMATION) presents a number of price measures for owner and rental housing developed following a hedonic price estimation technique. The importance of permanent income and wealth for the study of housing ownership and demand has been emphasized in the literature (Goodman 1988, Harmon 1988). Thus, permanent income and wealth profiles will also be estimated for my sample of households to later use as explanatory variables in the tenure and demand estimating equations (see PERMANENT INCOME AND WEALTH ESTIMATION).

I will approach my analysis of housing demand by comparing tenure arrangements of Canadian- and foreign-born households. This will allow me to compare homeownership patterns of households by foreign birth status, as well as possibly avoid the problems of sample selection and simultaneity. For this purpose, a two-stage Heckit estimation technique will be employed (see TENURE ESTIMATION). The results of the estimated demand equations will be presented in the final section (DEMAND ESTIMATION).

HEDONIC PRICE ESTIMATION

Prices of rental/owner housing are important determinants in the tenancy choice: renting or owning. They also determine the quantity of shelter consumed. Housing prices (as prices of any non-tradable goods) usually vary substantially across Canada and over time. Given their importance, I construct three price measures, the first two of which reflect regional and temporal price variations and the last of which measures individual investment potential of owned dwellings:

- real consumer *price indexes* for rental and owner housing,
- a *relative price* of owned housing and
- a *value-rent* ratio.

I construct these three variables using a hedonic price estimation technique. First, a hedonic equation of the following form is estimated:[24]

Natural log (real[25] Value of the dwelling/ Annual Rent) = linear function (rent coverage dummies[26], dwelling type dummies, dwelling age dummies, natural log of number of rooms and bathrooms, and interaction of regions of residence and survey years).

[24] The multiplicative nature of the above equation (value=α*β_i(house characteristics)*$\chi_j$exp(dummies)) is based on the observation that the absence of any of the house characteristics implies that the dwelling's value is equal to zero.

Next, the coefficients on the interactions of years and regions are used to construct a real inter-regional yearly Consumer Price Index (CPI) for owner/rental housing (by taking the antilog of the coefficient: see Appendix D). Given the construction of my hedonic equation, the computed CPIs (see Table 3) depict variations in real price indexes of housing rather than differences in prices of dwellings of various types and ages across Canada. These indices are used as deflators in order to calculate the quantity of consumed shelter and as regressors in the demand equations (price variables). Most of the observed variation in real prices of rental housing is between regions: shelter is more expensive in British Columbia and Ontario. Moreover, there has been an upward trend in real rental housing prices in British Columbia and Ontario, and a downward trend in the Atlantic Provinces and Prairies. The same time trends can be seen in real prices of owner housing. British Columbia and Ontario, where housing prices are increasing and above the Canadian average, have also taken the majority of incoming immigrants in the recent decades.

Table 3: Inter-Regional Annual CPI for Rental and Owner Housing (1984-1992)

	Rental Housing				*Owner Housing*			
Regions	**1984**	**1986**	**1990**	**1992**	**1984**	**1986**	**1990**	**1992**
Atlantic	0.81	0.78	0.75	0.68	0.52	0.51	0.52	0.47
Québec	0.76	0.78	0.82	0.77	0.50	0.57	0.69	0.59
Ontario	0.91	0.90	0.96	0.94	0.69	0.78	0.98	0.82
Prairies	0.88	0.83	0.76	0.72	0.61	0.50	0.49	0.49
BC	N/a	0.89	1.01	1	N/a	0.74	1	1

Source: Tables 3-19 are calculated by author from FAMEX 1984-1992.

In order to calculate (inter-regional annual) prices of owning with respect to renting, prices of standard units of owner and rental shelter in different years and regions of Canada have been calculated. A unit of owner housing is a detached house with 7 rooms and 2 bathrooms, and a unit of rental housing is an apartment with 4 rooms plus 1 bathroom. The ratio of the price of a standard unit of owner housing in a certain region and year and the price of a standard unit of rental housing in the same region and year is the *relative price* of owning with respect to renting. It ranges from 27.7 to 46.9 (mean=34.4) units for my sample. This measure will be used as a regressor in my tenure estimating equation.

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[25] Value or Rent deflated by Canadian annual CPI for all items (source: CANSIM database), 1992 –base.

[26] Rent may or may not include payments for utilities. Thus,8 dummies denoting facilities included in rent payments are used as explanatory variables: appliances and furniture, electricity, heat, water, parking, air conditioning, swimming pool, cablevision and other.

In order to capture the investment component included in the expenditures on owned shelter another price variable has been constructed: a *value-rent* ratio. It measures the "asset viability" of owner occupied housing (Megboulugbe and Cho 1996). As noted by Goodman (1988), a dwelling produces a stream of services, as well as a potential capital gain to its owner. A dwelling's value incorporates expectations about the flow of future rents and costs. A high value-rent ratio implies that owning is more attractive (a market-indicated expectation for a high capital gain for a particular property). My value-rent ratio has been constructed according to Goodman's (1988) methodology: predicted value of the dwelling divided by the predicted annual rent (that would be paid if this were a rented dwelling). Value-rent ratios in my sample lie in the 1.31 to 49.06 range (with a mean of 20.7). These values will be used as regressors in both the tenancy choice estimating equations and owner demand equations.

PERMANENT INCOME AND WEALTH ESTIMATION

A purchase of a house is a long-term decision based on the expected permanent income of the household. Since current income does not adequately reflect the long-term earnings potential of the households it is seldom used in the estimation of tenancy choice and the demand for shelter.[27]

It is possible to calculate the present value of an expected stream of future income (expected permanent income). However, for simplicity various permanent income proxies have been used in the literature on housing demand. Some of these measures are listed below (items 1 through 5 as outlined by Gandil (1996).

1) 'Median' measure of income is based on the median income of groups of observations. The underlying assumption is that observations in the same group are homogeneous in all respects.

2) 'Household consumption expenditure' is often used as a proxy for permanent income, especially if a measurement error may arise in the income variable.

3) Another measure of permanent income is derived from a fitted value from a regression of current income on current income lagged once or more times.

4) A simple average of past current incomes has also been used.

[27] Goodman (1988) observes, however, that the major impact of permanent income is in the tenure choice, rather than the demand equation.

5) One of the commonest measures is a fitted value from a regression of current income on household's socio-economic and demographic characteristics (age, education, occupation, etc.)

6) Some combination of the above.

I use the fitted value from the regression of the household earnings on various socio-demographic characteristics of the household as the proxy for households' permanent earnings in the tenure estimating equation.[28] The household earnings estimating equation is of the following form and is estimated for each household:[29]

Current household earnings[30]=linear function (age of the head of the household (HH[31]) dummies, single, married, male HH indicators, weeks worked part time and full time by HH, weeks worked part time and full time by spouse[32], education level of HH dummies, occupation of HH dummies, additional full time workers in the household, additional part time workers in the household, regions of residence, immigrant dummy, years since migration and their square).[33]

Another crucial variable in determining homeownership acquisition and shelter demand is wealth. Wealth aids the household in overcoming a liquidity constrain inherent in the purchase of a dwelling. In our context it is important to note that immigrants vary in their wealth holdings by entry gate upon arrival. For instance, immigrants admitted in the investment category bring with them substantial liquid assets. While I do not have information on the total wealth of households, I estimate my partial wealth variable according to the following methodology:

W=(HIFI/91RATE+HIOS+(VALUE-BOPOMO))/CPI, where W is real wealth (measured in 1992 dollars), HIFI is household income from investment, 91RATE is the average rate of return on other assets (91 day treasury bond return rate is used), VALUE is the nominal value of the dwelling, BOPOMO is the principle of the mortgage, and CPI is the yearly deflator.

Since we observe substantial differences in mean incomes of households of different origins (Table 4), their earnings equations will be estimated separately. Table 5 and Figure 13

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[28] However, total expenditure is my income proxy in some demand estimating equations (DEMAND ESTIMATION).

[29] Only positive income observations are used in the estimation. Then income is predicted for everyone using their household characteristics.

[30] Household's income from wages, salaries, self-employment income and government transfers (before taxes) is used for the formation of the dependent variable (deflated by the Canadian annual CPI for all items). Box-Cox transformation of the dependant variable is employed: $((\text{income}^x - 1)/x)$, where x is equal to 0.35 for owners and 0.33 for renters. These values are suggested by the Box-Cox test.

[31] HH: head of household

[32] Weeks worked by spouse are zero is there is no spouse.

[33] Income equations were also estimated separately for Canadian and immigrant households of different origins for more disaggregated analysis.

present household earnings estimates (equivalent to fitted value from regression in Table 4) for stylized[34] households with heads of different origins (by age and time in Canada).[35]

Table 4: Mean Household Income (Various Measures) by Region of Origin and Years in Canada (in 1992 dollars)

Income measure	Canadian HH	Immigrant HH	Old immigrant (more than 10 years)	Recent immigrant (less than 11 years)	HH from US and Western Europe	HH form Other Europe	HH from Asia	HH from Other Countries
Current income before taxes	47,328	45,631	46,907	40,852	46,904	42,311	49,919	42,891
Current income after taxes	38,015	37,347	38,203	34,138	37,863	35,246	40,711	35,496
Total expenditure	46,096	44,182	44,595	42,637	44,134	40,542	49,644	43,991
Current earnings	42,854	40,057	40,503	38,388	39,180	36,744	46,059	40,699
Fitted value from regression[36]	41,016	38,188	38,471	37,127	36,354	35,923	44,041	39,527
Transitive[37]	1,838	1,870	2,032	1,261	2,826	820	2,018	1,172
Wealth	56,623	90,602	105760	33,811	97,551	112760	80,299	42,770

(Source: Calculation by Author from FAMEX 1984-1992)

Estimated earnings of recent immigrant households are less than the estimated earnings of Canadian and older vintages of immigrant households. This observed trend in predicted income estimates presented in Table 5 is consistent with previous research. Upon arrival in Canada, immigrants might face discrimination, their credentials might not be readily accepted, and they lack complementary human capital, which results in low initial earnings. However, after time in Canada, as they assimilate into the Canadian labour market, their earnings may catch up to those of Canadians.

[34] A stylized households consists of 3 members, with the head holding a university degree and a managerial profession, and other predetermined characteristics (constant across various origins).

[35] These estimates will be used to predict housing expenditure by immigrants of different origins.

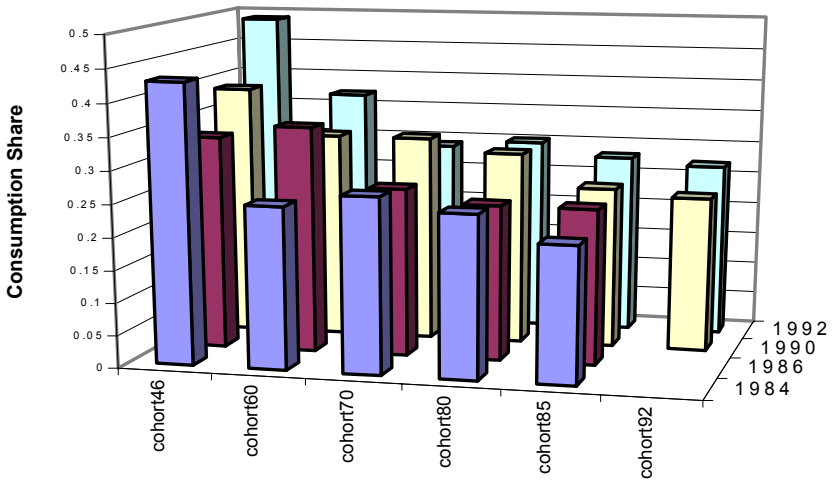
[36] Current earnings regressed on a number of socio-demographic characterisitcs (see equation above).

[37] Fitted value from regression minus current household earnings (wages and salaries + income from self-employment + government transfers).

Table 5: Predicted Household Earnings by Origin, Age and Years Since Migration of the Head of the Household[38] for Stylized Households

Age of HH (years in Canada)	Canadian	Immigrant	US, West Europe	Other Europe	Asia	Other Regions
30 (5)	91,055	78,106	84,540	79,578	65,718	71,842
40 (15)	94,806	85,797	86,665	86,242	79,344	74,485
50 (25)	96,466	89,068	88,653	87,002	83,374	75,314

Figure 12: Mean Rental Housing Consumption Shares by Survey Year and Immigration Period Cohort



TENURE CHOICE ESTIMATION

Expenditures on shelter are fundamentally different for owners and renters (as demonstrated above). Thus, housing demand will be estimated separately for these two tenure arrangements. This, however, might lead to the sample selection problem. A positive quantity of owned housing would be consumed if the decision to own a house were made, but this in part depends on whether the desired house below a threshold value exists. Thus, the owner or renter sample is not representative of the whole population. The tenancy choice and quantity of housing demanded may also be jointly determined leading to a simultaneity problem. Consequently, some explanatory variables in the owner and renter demand equations might be correlated with the error term, which will lead to biased estimates if no correction is made.

A two-stage Heckman estimation of demand for shelter will reduce the bias of inherent in the sample selection/simultaneity problem. The first stage of this estimation technique (that

[38] Dependant variable is household earnings (income from wages and salaries, self-employment income and government transfers).

estimates the probability of owning) produces a variable called the Inverse Mills Ratio (IMR)[39]. It can later be used as an additional regressor in the demand for shelter equations.[40]

The tenure choice equations are run for all households and separately for Canadian-born and foreign-born households. They have a logit form, where the probability of owning is easy to calculate and is equal to $1/(1+exp(-\beta X))$, where β is the estimated coefficients and X a vector of explanatory variables including an instrument for permanent (and transitive component) income, wealth holdings, relative price of owning with respect to renting,[41] value-rent ratio,[42] family size, male head of the household indicator, married head of the household indicator, single (never married) head of the household indicator, age of the household head dummies, region of residence dummies, years since migration (for immigrants) and a constant. Table 6 presents the estimated coefficients from the logit regressions.

Specification (1), which includes a wealth variable, has a greater explanatory power (higher R square and success index) than a specification without this variable. Thus, this form of the tenure equation will be generally used below. In the restricted tenure choice equation (all households), the immigrant dummy has a significant negative coefficient denoting that immigrant households would have a lower than average probability of homeownership upon their arrival to Canada. However, if they were given the same endowments as Canadian households they would achieve the "Canadian" level of homeownership in approximately 14 years.[43]

Noteworthy is the importance of the price variables in the tenure estimating equation. A higher relative price of homeownership is associated with a higher probability of renting according to the regression results (negative sign on the relative price variable). The investment potential of the dwelling is also important in the tenure estimating equation. The value-rent ratio positively influences the probability of owning (as expected) and is highly significant. Its coefficient is greater for immigrants, which implies that when purchasing a dwelling immigrants are motivated by investment possibilities more than Canadian households.

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[39] The inverse Mills ratio is equal to $\phi(X\beta)/\Phi(X\beta)$ if Y=1 or $\phi(X\beta)/(\Phi(X\beta)-1)$ if Y=0, where ϕ is the density function for the standard normal and Φ is its cumulative density function.

[40] See appendix E for interpretation of IMR.

[41] See Hedonic Price Estimation for description and motivation.

[42] See Hedonic Price Estimation for description and motivation.

[43] According to unrestricted regressions (separately for Canadian and immigrant) households of specification 1. However, X=27 in the restricted equation of specification 1 (–1.1+0.041x=0) and 19 according to specification 2.

Table 6: Estimated Coefficients from LOGIT Regressions estimated for all households (pooled data: 1984-1992)[44]

Dependent variable: Y=1 if owned, Y=0 if rented dwelling.				
Specification	1	1	1	2
R SQUARE (CHOW)	**0.46317**	**0.458876**	**0.50775**	**0.40776**
SUCCESS INDEX	**0.451**	**0.446**	**0.492**	**0.402**
N	(N=20,337)[45]			(N=20,241)
HOUSEHOLDS	ALL	CANADIAN	IMMIGRANT	ALL
AVERAGE INCOME[46]	**N/A**	**N/A**	**N/A**	**0.00003**
PREDICTED EARNINGS	**0.000028**	**0.000029**	**0.000021**	**N/A**
TRANSITIVE COMPONENT	**0.000028**	**0.000027**	**0.000028**	**N/A**
WEALTH	**0.000019**	**0.000019**	**0.000018**	**N/A**
VALUE-RENT	**0.041**	**0.026**	**0.12**	**0.18**
RELATIVE PRICE	**-0.044**	**-0.03**	**-0.11**	**-0.11**
FAMILY SIZE	**0.22**	**0.23**	**0.18**	**0.21**
MALE	**0.18**	**0.23**	*-0.1*	**0.19**
MARRIED	**0.75**	**0.68**	**1.07**	**0.61**
SINGLE	**-0.32**	**-0.32**	**-0.32**	**-0.13**
AGE OF HH	**0.18**	**0.17**	**0.16**	**0.18**
AGE SQUARE	**-0.0015**	**-0.0014**	**-0.0016**	**-0.0013**
ATLANTA	*0.06*			**0.25**
QUÉBEC	**-0.67**			**-0.49**
ONTARIO	**-0.42**			**-0.29**
PRARIES	*-0.18*			*-0.02*
IMMIGRANT dummy	**-1.1**	**N/a**	**N/a**	**-1.55**
YSMREF	**0.041**	**N/a**	**0.067**	**0.11**
YSMREF2	**-**	**-**	**-**	**-0.0015**
CONSTANT	**-6.37**	**-6.55**	**-5.44**	**-6.72**

Average Household Analysis vs. Stylized Household Analysis

Two approaches are used to conduct comparisons between immigrant and non-immigrant households. The first technique, which employs mean values, is to analyze the "average" household. The second technique is more imaginative and constructs various types of households of interest. For instance, I create a hypothetical household (consisting of 3-members with a 30-

[44] In italics are coefficients with the absolute values of t-stat less than 1.64 (5% level of significance for one-tail hypothesis test.

[45] Also included are households that moved from renter to owner occupied dwelling in the year of the survey.

[46] Average of (fitted value from regression+other non-earnings income) and income before taxes.

year-old male head that holds a university degree and a managerial occupation), and call it a *stylized household.*[47]

Comparison at Means

Given average endowments (income, wealth, value-rent ratio, relative price of owning, family size, proportion of male married households, age of household head, and years in Canada[48]) probabilities of homeownership are predicted for Canadian, recent and older vintages of immigrant households. From Table 7 it can be seen that factors other than the household's endowment (in a broad sense)[49] explain the majority of the absolute difference between homeownership probabilities for Canadian and recent immigrant households.[50]

Table 7: Homeownership probabilities of Canadian and immigrant households at Canadian and own endowments (CE and OE) predicted at means

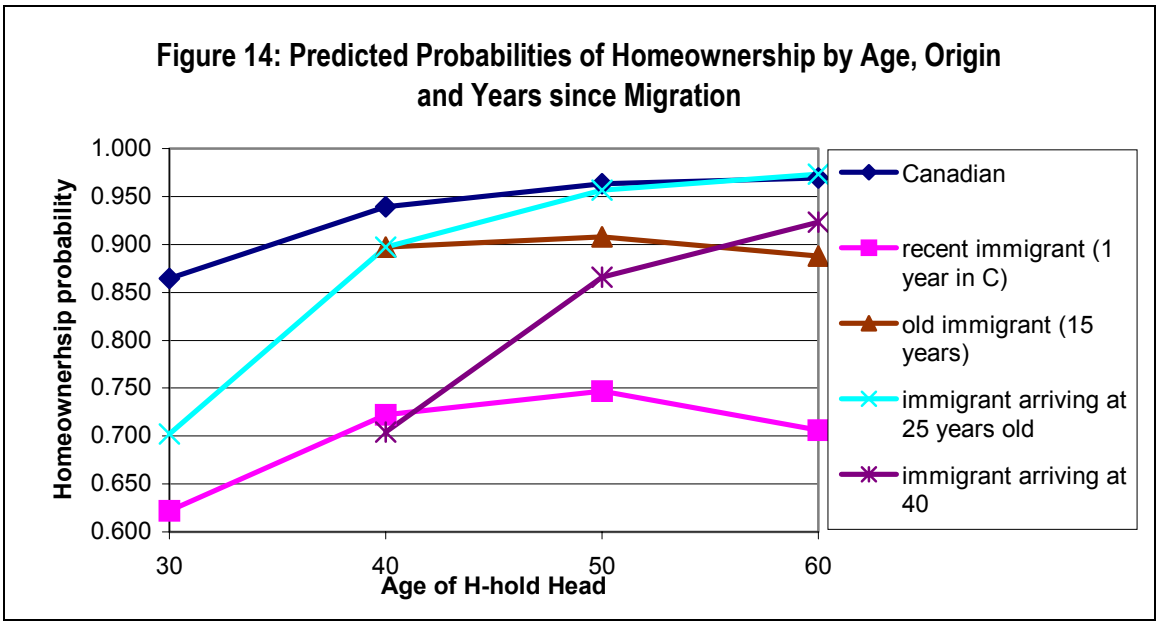
	Canadian	Recent: OE	Old: OE	Recent: CE	Old: CE
Specification 1	0.83	0.51	0.91	0.63	0.81
Specification 2	0.68	0.21	0.72	0.24	0.64

Stylized Household Analysis

Figure 14 illustrates probabilities of homeownership for my *stylized Canadian and immigrant households*[51] holding years in Canada constant (1 and 15 years for "recent" and "old[er]" vintages of immigrant households respectively) and letting them vary (using predicted earnings income[52] and other set characteristics over their lifetime). First I observe that the probability of owning the occupied dwelling increases with the age of the head of the household. The probability of owning a dwelling also increases with time in Canada: i.e. probabilities of owning are much higher for "older" immigrants (i.e. immigrants who have stayed in Canada for a longer period). The immigrants' homeownership patterns appear to converge to those of Canadians as years since migration increase. In fact immigrant heads that came to Canada at the age of 25 achieve the Canadian level of homeownership after approximately 25 years in Canada.[53] Age at immigration also affects assimilation. Younger immigrant-headed households (20–35 years old) are able to

[47] Sometimes referred to as a representative household.
[48] Years in Canada: 1 year for recent immigrant households and 15 years for old immigrant households.
[49] Endowments include income, value-rent ratios, family sizes, ages of household heads, etc.
[50] Specification 2: (0.24-0.21)/(0.68-0.21)=0.06 (explained by endowments)
[51] My stylized (representative) household usually consists of three members, two of whom are a married couple, with the head of the household being a male, having a university degree and a managerial occupation, and living in BC (if applicable) (wealth holdings=$30,000).
[52] Earnings incomes were predicted for representative Canadian and immigrant households and then used to predict probabilities of homeownership.
[53] This number could be smaller if immigrant households accumulate wealth faster: wealth holdings are equal for purposes of this simulation.

assimilate much more quickly into the housing market, and eventually some of them might overachieve Canadians. However, immigrants arriving to Canada at an older age (late forties and older) never catch up to the Canadian norm of homeownership.



Source: Figures 14-21 are calculated by author from FAMEX 1984-1992.

Assimilation into the housing market by immigrants could be a by-product of labour market assimilation. The following question arises: How much of the difference in homeownership patterns between Canadian and immigrant households is due to their endowments of income and wealth? As depicted by Figure 15, factors other than differential income endowment play a more decisive role in determining immigrant patterns of homeownership. Predicted homeownership probabilities of representative[54] "old" and "recent" immigrant (15 and 1 years in Canada respectively) households are calculated using own and Canadian endowments of predicted earnings income, wealth and transitive component of income.[55] In the case of "older" immigrant vintages, whose income level is similar to that of Canadians (and whose wealth level exceeds that of Canadians), the resulting probabilities of homeownership (using Canadian endowments) are below their original ones. In the case of young "recent" immigrant households, they change only slightly. As illustrated by Table 8, endowments

[54] A representative household consists of 3 members, with a male married head, holding a university degree and a managerial occupation ($30,000 wealth holdings).

[55] Median income and wealth values for Canadian, recent (less than 8 years in Canada) and old immigrant households (more than 10 years in Canada) are used. Other characteristics are set to be equal for Canadian and immigrant households.

account for less than 23 percent of the difference in homeownership patterns of Canadian and "recent" immigrant households.

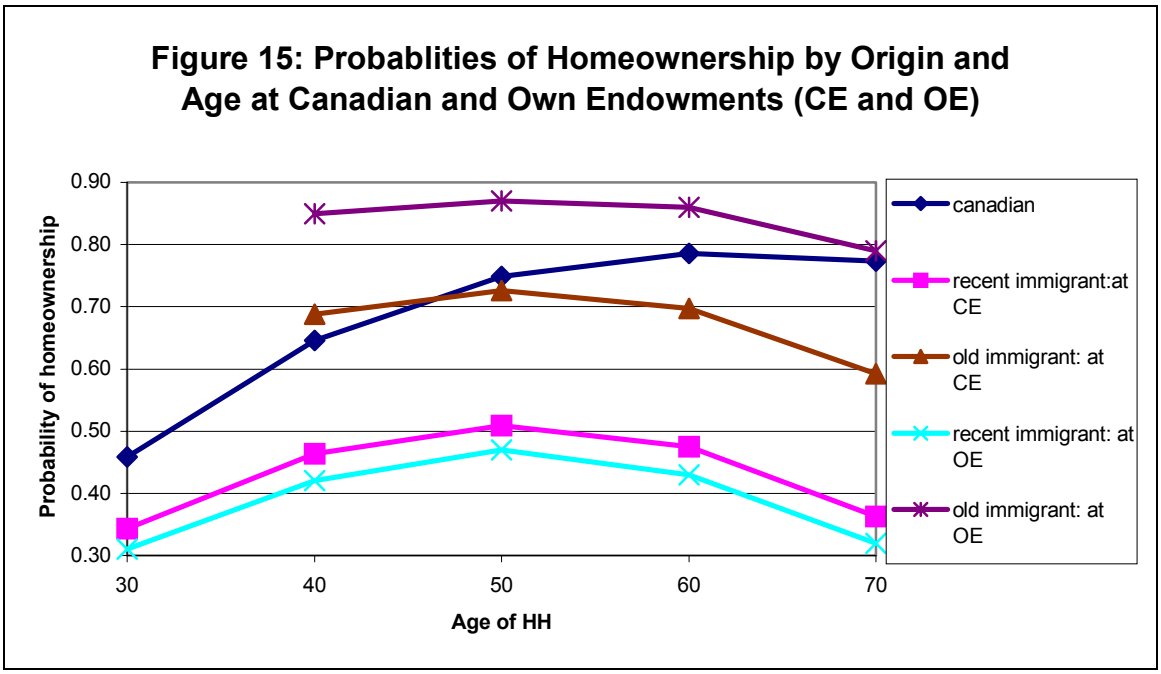


Table 8: Difference in Probabilities of Recent Immigrant Homeownership Attributed to Endowments and Other Factors

Head of Household	Share of difference explained by other factors	Share of difference explained by endowments
30 years old	0.78	0.22
40 years old	0.81	0.19
50 years old	0.86	0.14
60 years old	0.87	0.13

As suggested by the descriptive statistics, probabilities of homeownership vary across Canada. The coefficient on the Québec dummy is negative and significant meaning that residents of Québec tend to use rental dwellings for shelter to a greater extent than elsewhere. Separate regressions for different regions also showed that immigrants in Québec fare worse than immigrants in other parts in Canada in terms of assimilating into homeownership.[56]

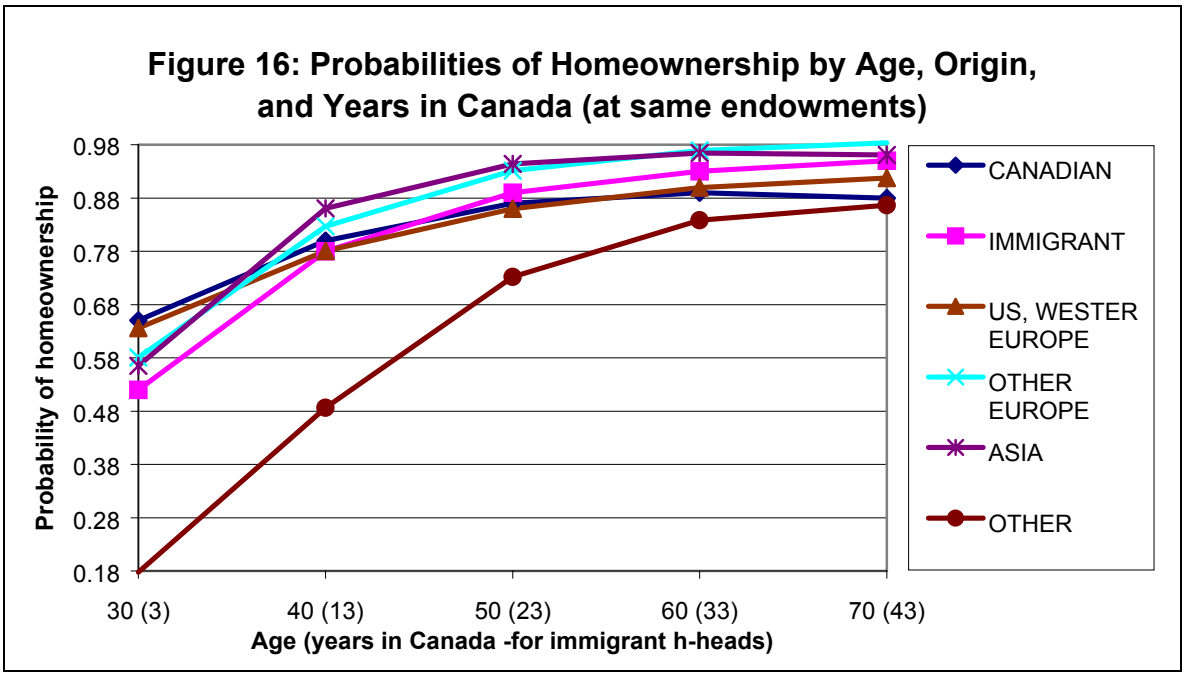
Figure 16 presents[57] homeownership probabilities for immigrants by their origins. If given the same endowments as Canadian households, immigrants from Asia and Central and

[56] Results can be obtained from athor upon request.
[57] Figure 16 is simulated for stylized households at $40,000 predicted earnings income and $30,000 wealth holdings.

Eastern Europe would achieve the Canadian norm of homeownership in some 9-10 years of their stay in Canada. Asian immigrants catch up to the Canadian norm of homeownership the fastest. They are followed by immigrants from "Other Europe" (East and Central), who also assimilate very quickly into homeownership. US and Western European immigrant probabilities of homeownership approximate those of Canadians throughout the length of their stay in Canada (with similar endowments). However, immigrants from other regions (Africa and Latin America) lag behind in their homeownership probabilities.

How Much Does Housing Discrimination Cost an Immigrant Household?

Immigrants' probabilities of homeownership may differ from those of Canadians due to different endowments and other factors such as discrimination, tastes and preferences, etc. There is evidence that discrimination presently persists in the racially segregated housing market in the US (DeRango 2001), and this could also be the case in Canada.



Thus, a crucial question emerges: How much of these observed differences in housing demand can be attributed to differential endowments of earnings income and how much to other factors? These other factors or barriers to homeownership may include a lack of credit history in Canada and discrimination. The following scenario is illustrative of the analytical tack I will take to isolate the cost of discrimination. Two similar heads of the households enter a bank in order to request a mortgage for a house they want to buy. They are the same age, earn similar incomes, possess equal stocks of wealth and have equal family sizes and education levels. The only

observed difference is that one of them is a newly arrived immigrant, and the other one is Canadian-born. Now if the immigrant is not granted a mortgage but the Canadian born is, the opportunity cost of the unobservable barriers (discrimination) to homeownership for the immigrant household can be estimated. I calculate this opportunity cost by posing a counterfactual question. In short, how much more income would an immigrant household need to earn in order to for the bank to issue them a mortgage given the same observable characteristics? Two separate experiments are conducted in order to answer this question, under the assumption that unobservable characteristics are homogeneously distributed across population groups.

The first experiment is to calculate the probability of homeownership for immigrants using Canadian endowments.[58] The amount by which the resulting probabilities diverge from the Canadian ownership norm is the difference between immigrant and Canadian probabilities of homeownership, which can be attributed to factors other than differential endowments of earned income. In our case, these new calculated probabilities of homeownership for immigrant households using Canadian endowments differ somewhat from the original probabilities using immigrant endowments (see Table 9). However, the majority of the difference in the probabilities of homeownership between Canadian and "recent" immigrant households is due to factors other than endowments, namely discrimination, tastes and preferences, lack of a credit history, etc. When differential income endowments do matter (i.e. in homeownership probabilities between Canadian and older vintages of immigrants), the magnitudes of the differences are very small.

Table 9: Comparison of Probabilities of Homeownership of Canadian and Immigrant Households of Different Origins

	Recent Immigrants (30 years old and 1 year in Canada)				***Old Immigrants (40 years old and 15 years in Canada)***			
Canadian benchmark	***0.864***				***0.939***			
	All	***US, WE***	***Other Europe***	***Asia***	***All***	***US, WE***	***Other Europe***	***Asia***
Using own endowments	**0.622**	**0.736**	**0.712**	**0.584**	**0.781**	**0.867**	**0.929**	**0.941**
With Canadian endowments	**0.708**	**0.759**	**0.781**	**0.735**	**0.914**	**0.881**	**0.941**	**0.957**
Share of difference explained by endowments	**0.355**	**0.180**	**0.454**	**0.539**	**0.842**	**0.194**	**1.200**	**-8.000**

[58] A fitted value from a regression of current income on household's socio-economic and demographic characteristics is used as a measure of income of a representative household for the calculation of predicted probabilities of homeownership.

In the second experiment, I find the "opportunity cost" of owning for various immigrant households, i.e. I solve for the income increment that allows an immigrant household to obtain the same probability of homeownership as that of a representative Canadian household.[59] This opportunity cost is a dollar measure of the difference in homeownership patterns between representative Canadian and immigrant households due to such unobservables as discrimination, immigrants' tastes, lack of a credit and employment records for immigrants, etc. My findings are summarized in Tables 10 and 11, which compare the opportunity cost of owning for a three-person household cross-classified by age and origin.

As can be seen, young newly arrived immigrant households (30-year-old head) have a positive opportunity cost of homeownership, which is relatively high in magnitude. The income increment necessary to equate probabilities of Canadian and immigrant homeownership is even higher for older recent immigrants: over $80,000.[60] The opportunity cost of owning for immigrants decreases with time in Canada. It decreases the fastest for immigrants from Asia and Central and Eastern Europe. Older vintages of immigrant households from Asia and Central and Eastern Europe seem to have an advantage over Canadian households in relation to homeownership probability (the income increment is negative, thus the opportunity cost is equal to zero).

Table 10: Estimated Opportunity Cost of Owning for Recent Immigrant Households (less than 1 year in Canada) in Comparison with Canadian-born Households[61] (in $1992)

	30-year-old HH (1 year in Canada)	***40-year-old HH (1 year in Canada)***
All immigrant households	**63,541**	**83,280**
Immigrant households from US and W. Europe	**53,639**	**88,895**
Immigrant households from Other Europe	**41,500**	**48,444**
Immigrant Households from Asia	**74,367**	**87,161**

Table 11: Estimated Opportunity Cost of Owning for Old Immigrant Households in Comparison with Canadian-born Households (in $1992)

	40-year-old HH (15 years in Canada)	***50-year old HH (25 years in Canada)***
All immigrant households	**26,378**	**8,534**
Immigrant households from US and W. Europe	**55,179**	**52,010**
Immigrant households from Other Europe	**7,060**	**-16,545**
Immigrant Households from Asia	**-2,259**	**-28,232**

[59] See appendix F for a detailed description of how these estimates were constructed.
[60] In 1992 nominal dollars.
[61] See appendix F for a detailed description of how these estimates were constructed.

DEMAND EQUATIONS

Measurement problem: value-based vs. expenditure-based owner demand

Consumption of owner housing per se is difficult to measure due to the investment component included in the expenditure on owned housing. In addition, expenditures on owner housing differ substantially for owners with and without a mortgage reflecting their different equity positions. One attempt to capture the investment component of expenditures on owner housing (and thus purge the dependent variable of it) is the inclusion of the *value-rent ratio* as an explanatory variable into the demand equation. Apart from the explicit shelter expenditures by the households, there exist alternative measures to capture expenditures as the dependent variable, such as the dwelling value and predicted rent.

In this study, the value of the dwelling (deflated by owner housing CPI) is chosen as the measure of quantity demanded of housing. This measure reflects the size and quality of the occupied dwelling, as well as neighborhood characteristics (information about which is not readily available).[62]

An alternative measure of demand for housing (expenditure on housing deflated by owner housing CPI) is also used for comparison purposes. However, since a significant component of expenditures on owner housing is mortgage interest payments, which is equal to zero in case of mortgage free owners the opportunity value of equity in the house will be added to the owners' expenditures.[63]

Thus, I estimate three demand equations: two forms of owner demand (expenditure-based and value-based)[64] and one form of rental demand for shelter (with the logarithm of rent deflated by CPI as the dependent variable). In addition, they are estimated for the whole sample, as well as sample or recent movers (see Table 12).[65]

Empirical Results

Tables 12 and 13 present estimated coefficients from the demand equations which take the following form:

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[62] I assume that the bias resulting from the omission of neighbourhood characteristics in estimating equations is small.

[63] (Value of dwelling – balance on the mortgage) * 91 day treasary bill interest rate. Of course, all the expenditures are in real terms: deflated by the annual CPI for all items with 1992 as the base year.

[64] Expenditure based: natural log ((expenditure on owner housing + (value of dwelling – mortgage balance) * 91 day interest rate)/ CPI). Value based: natural log (value of dwelling/ CPI).

[65] Recent movers moved in the year of the survey or are immigrants with less than 3 years in Canada.

Restricted (one regression for immigrant and non-immigrant households):

Natural Logarithm (Value Owned Dwelling (or Annual Expenditure) / CPIowner // Annual Rent / CPIrenter) = linear function (natural logarithm (total expenditure),[66] natural logarithm (CPIowner), natural logarithm (value-rent ratio), family size, square of family size, male, single, married head of the household (HH), age and age squared of the HH, immigrant dummy, Year since migration and its square, IMR, and a constant).

Unrestricted (separate regressions for immigrant and non-immigrant households):[67]

Same as above without immigrant dummy and (for Canadian households) without years since migration.

According to the results of the restricted regressions (Table 12) immigrant households spend more on both rental and owner housing (positive coefficient on the immigrant dummy). It should be noted that this is also true in the case of recent movers (owners). There is also some limited evidence of convergence[68] to the Canadian-born norm (i.e. a negative coefficient on the years since migration variable). The immigrant dummy and years since migration coefficients are not significant in the renter equation. However, when the unrestricted regressions are run (separately for Canadian and immigrant households: see Table 13), immigrant households have a much greater expenditure elasticity, and spend more on rental shelter overall when given equal endowments. The coefficient estimates in the demand equation with the narrow definition of immigrant households are very similar to those of the broad definition. Thus, the latter will be used in my later analysis.[69]

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[66] Various income variables have been tested, and most times equations of this form produced the best results in terms of adjusted R2 and my specification tests (RESET). Total expenditure is often used as a proxy for permanent income (see PERMENENT INCOME section).

[67] According to F-tests, restrictions on all the coefficients between Canadian-born and immigrant households can be rejected at least at the 5% level of significance (both rental and owner demand).

[68] Very little convergence is observed in the simulations at age (Figures 19-21).

[69] Same definition is used by CMHC (2000, series 55-3). It also allows a larger immigrant sample (more degrees of freedom).

Table 12: Coefficients for Restricted Model with Broad and Narrow Definitions of Immigrant Households

Definition of immigrant	*broad*	*narrow*	*broad*		*narrow*	*broad*		*narrow*
Dependent variable	*ln (rent/cpi)*		*ln (expenditure on owned dwelling/cpi)*			*ln (value of dwelling/cpi)*		
R square adj.	0.3126	0.3126	0.461	0.5003	0.457	0.4071	0.4956	0.4051
Recent mover				RM sample			RM sample	
N	8222	8222	11688	441	11688	12046	385	12046
ln (expendit.)	0.4	0.4	0.33	0.61	0.33	0.26	0.44	0.26
ln (price)	-0.29	-0.29	-0.69	-1.05	-0.68	-0.77	-1.11	-0.76
ln (value-rent)	N/a	N/a	0.82	0.62	0.83	1.12	0.97	1.12
age of HH	*-0.002*	*-0.002*	-0.0066	0.019	-0.007	0.0033	*0.0016*	0.0034
age square	0.00005	0.00005	0.00008	*-0.00017*	0.00009	-	-	-
immigrant d	*0.014*	*0.01*	0.18	0.2	0.18	0.15	0.2	0.15
yrs. in Canada	*-0.00026*	*-0.0007*	-0.0017	NA	-0.0024	-0.012	NA	-0.013
constant	4.44	4.44	3.76	*0.34*	3.8	5.53	3.73	5.55
Canadian[70]	6,300	6,300	12,325	7,827	12,951	116,745	88,561	117,753
predicted immigrant[71]	6,380	6,341	14,630	9,560	15,321	127,740	108,168	128,200

Based on the results of the unrestricted[72] demand equations (Table 13) the following can be concluded. The Inverse Mills ratio is significant in the Canadian owner equations indicating a significant correlation between the error terms in the tenure and demand equations.[73]

The impact of demographic variables on the demand for shelter is reviewed below. The family size variables obtains a negative coefficient for owners and a positive one for renters. The negative coefficient signals the existence of scale economies for shelter in households and a positive coefficient vice versa. Additional demographic indicators pertaining to the head of the household (*male*, *married* and *single)* are often insignificant, especially in immigrant shelter demand equations, which have smaller sample sizes. Age of the head of the household has a positive influence on the value of owned dwelling and rental expenditure, and a negative effect on the expenditure for owned housing.[74] Initially immigrants spend more on shelter but with time in Canada they spend less, given the significantly negative coefficient on the years since migration variable. However, according to my simulations over age (Figures 19–21) little convergence

[70] Predicted expenditure for a Canadian 3-member household with a 40-year-old male married head, at $45,000 expenditure.

[71] Same as above, 5 years in Canada.

[72] Restrictions (same coefficients for immigrant and Canadian households) were rejected by Chow tests.

[73] However, this variable is excluded from final demand estimating equations in order to use comparable models for Canadian and immigrant samples.

[74] From Figures 20 it appears that a positive income effect counteracts a negative age effect in the expenditure equation. Thus, owner housing expenditure by a representative household does not vary during its life cycle or increases.

appears in immigrant expenditures over the immigrant household's life cycle. Likewise, years since migration have no influence on the demand for owner occupied dwellings (when measured in value terms – insignificant coefficient).

Economic variables play even a larger role than socio-demographic variables in determining the quantity demanded of housing. The adjusted R^2 for the uncontrolled demand equations (for demographic variables) is only slightly lower than the adjusted R^2 in the controlled regressions.[75] The value-rent ratio which measures the investment potential of the dwelling is positive and highly significant across the three sets of relevant equations for immigrant and Canadian-born households.

Given the model specification (log-log demand equation), coefficients on the income and price variables can be interpreted as elasticities for shelter demand. One can observe that the income elasticity of Canadian owners exceeds that of immigrant owners. The opposite is true in the case of renters. Demand for shelter is price inelastic.[76] Demand for owner shelter is more price elastic than rental demand.[77] However, income and price elasticities obtain a much larger range of values when demand equations are estimated separately for immigrants of different origins as we see below.

[75] Results can be obtained from author upon request.
[76] In the Cournot price elasticity reported income effect resulting from the change in price is included in the price coefficient.
[77] Owners have an option of renting – hence, more substitutes.

Table 13: Estimated Coefficients from Demand Equations

	Canadian	Immigrant	Canadian	Immigrant	Canadian	Immigrant
dependent variable	ln (value of dwelling/cpi)		ln (expenditure on owned dwelling/cpi)		ln (annual rent/cpi)	
R square	0.4148	0.3042	0.4614	0.4163	0.2907	0.4585
N	9830	2216	9522	2166	7027	1195
LN (EXPENDITURE)	0.3	0.24	0.35	0.3	0.39	0.47
LN (PRICE)	-0.82	-0.71	-0.73	-0.64	-0.31	-0.17
LN (VALUE-RENT)	1.14	1.13	0.85	0.83	n/a	n/a
AGE OF HH	0.0043	0.0027	-0.004	-0.003	-0.0042	0.0049
AGE SQUARE	0	0	0.00006	0.00005	0.00007	-0.000029
FAMILY SIZE	-0.02	-0.0005	-0.06	-0.05	0.05	0.02
FAMILY size square			0.004	0.005	-0.0046	0.00007
MALE	-0.027	-0.001	-0.04	-0.03	-0.04	-0.05
SINGLE	-0.016	0.07	-0.03	0.08	0.0005	-0.03
MARRIED	0.016	0.01	0.02	0.04	-0.02	-0.014
MILLS	SIGN	INS	SIGN	INS	INS	INS
YSMREF		0.0006		-0.0014	n/a	0.0013
CONSTANT	4.99	5.81	3.3	4	4.58	3.68
Predicted at $45,000 income[78]	127,967	150,371	12,059	14,577	6,318	7,068

Shelter Consumption by Immigrant Households of Various Origins

So far the restriction of equal coefficients for all immigrant households regardless of origin has been imposed. The validity of this restriction is tested for immigrant households by source (US and Western Europe, Other Europe, Asia, Other Regions). The coefficients from the unrestricted regressions that produced the best results (F-stat and adjusted R square) are presented in Table 14.[79]

In turn, Figures 17 and 18 using the method outlined above graphically present consumption patterns for owner and rental shelter expenditures by age for a representative household given their region of origin and time in Canada.[80] It is observed that immigrant homeowners from all origins (except US and Western Europe) occupy dwellings of higher values than Canadian-born headed households. Other European, Asian owners and owners from "Other Regions" have the highest-valued dwellings.

[78] 3-member household with a 40-year-old male married head (5 years in Canada – immigrant)

[79] Interaction dummies for various origins are included in demand equations. See appendix G for more detailed explanation of how the restrictions have been tested.

[80] Predicted household expenditures are used for the calculation of estimates presented in figures 19 thourgh 21: see appendix H for the predicted expenditures for my stylized households over life cycle.

Table 14: Estimated Coefficients from Demand Equations with Origin Intercept and Slope Dummies

dependent	ln (value/cpi)				ln (rent/cpi)			
R square	0.3083				0.4715			
p-value[81]	2.8%				0.005%			
N	2216				1195			
VARIABLE	US, W Europe	Other Europe	Asia	Other regions	US, W Europe	Other Europe	Asia	Other regions
LN (expend)	0.2	0.24	0.28	0.34	0.5	0.46	0.42	0.48
LN (CPI)	-0.68	-0.64	-0.41	0.36	-0.34	*-0.24*	*0.25*	*-0.31*
LN (V-R)	1.09	1.22	0.95	0.78	*n/a*	*n/a*	*N/a*	*n/a*
AGE	0.018	*-0.012*	0.004	0.0073	*-0.008*	*0.013*	0.034	*0.002*
AGE square	-0.00015	*0.0001*	0	0	*0.0001*	*-0.00007*	-0.00038	*0.000012*
FAMILY SIZE	*-0.0019*	*-0.0019*	*-0.0019*	*-0.0019*	*0.025*	*0.006*	0.038	*-0.0024*
MALE	*0.003*	R[82]	R	R	*-0.034*	-0.2	*-0.003*	*-0.013*
SINGLE	*0.07*	R	R	R	*-0.09*	*0.06*	*-0.04*	*0.056*
MARRIED	*0.015*	R	R	R	*-0.07*	0.13	*-0.07*	*0.026*
YSM	*-0.0009*	0.006	*0.003*	*-0.004*	*0.0017*	*-0.0038*	0.0064	*0.0007*
Origin dum.	R	R	R	R	R	R	R	R
CONSTANT	5.93	R	R	R	3.62	R	R	R
Predicted at $45,000 income[83]	141,972	150,296	162,079	202,927	6,612	7,227	7,670	7,125

Under my rental simulation in Figure 18 most immigrant source groups spend more on rental housing than Canadian-born households with immigrants from Asia, US and Western Europe paying the most in rent. In addition, there is little convergence to the Canadian norm over time.[84]

[81] P-value for rejecting the restricted model (one equation for all immigrants).
[82] Restriction is valid for this variable.
[83] 3-member household with a 40-year-old male married head (5 years in Canada – immigrant)
[84] Note that coefficients on age and years since migration variables are not always significant.

Figure 17: Predicted Value of Owned Dwelling by Age and Origin

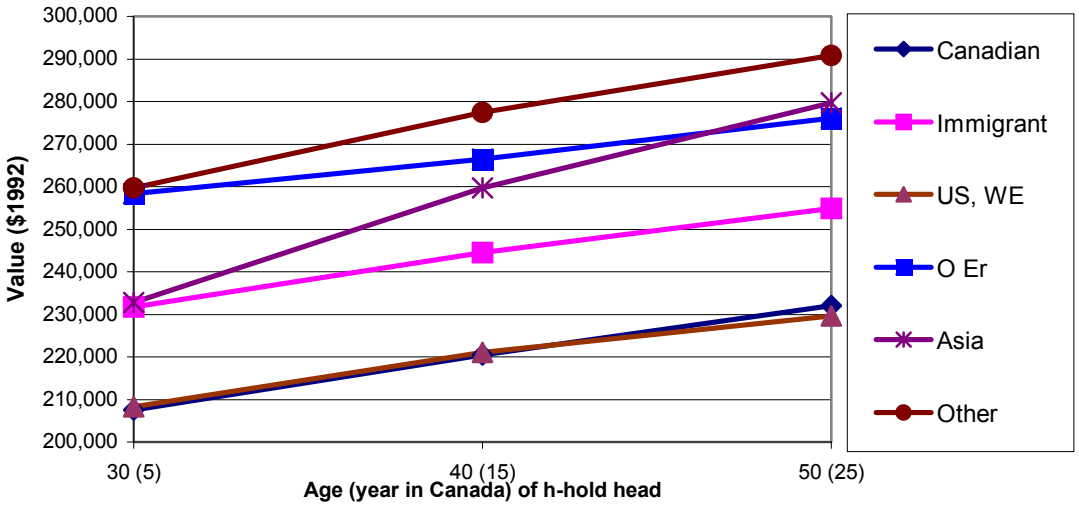
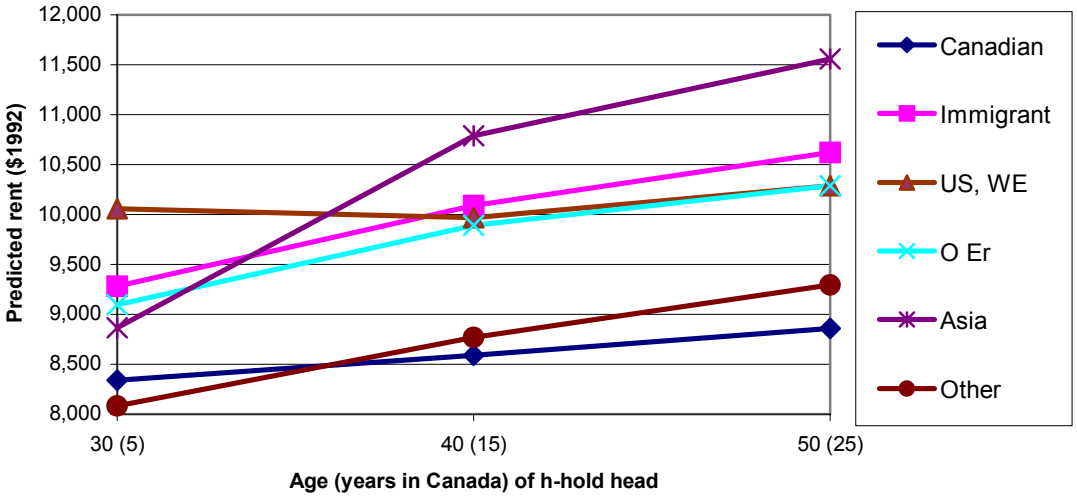


Figure 18: Predicted Rent by Age and Origin



Decomposition Analysis: How Much of the Difference in Shelter Consumption Patterns is explained by Differential Endowments?

A stylized household analysis[85]

As noted above, differential shelter consumption could be influenced by differential income levels of households. However, as can be noted from Figures 17 and 18, representative immigrant households spend more on shelter even though their income levels are below those of Canadian households. As depicted in Figures 19 through 21, immigrant households would spend even more

[85] See appendix I for analysis at means.

on shelter if given the higher Canadian incomes. Thus, the existing gap in expenditures can be explained by factors other than endowments, for example tastes (see Table 1J in Appendix J and Figures 19-21).

Figure 19: Predicted Expenditure on Owner Housing at Own and Canadian Endowments (OE and CE)

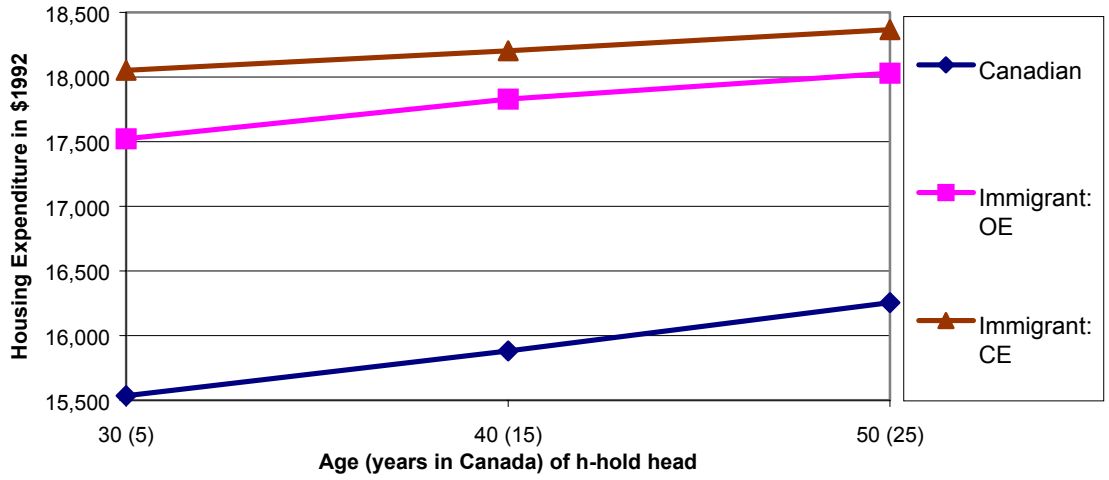


Figure 20: Predicted Values of Owned Dwellings by Age and Origin (at Own and Canadian endowments: OE and CE)

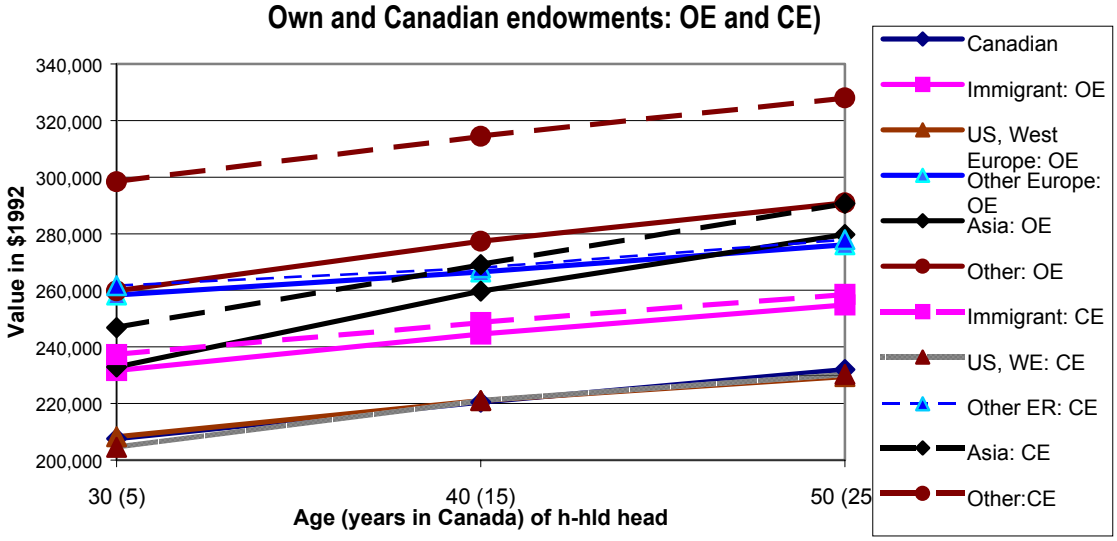
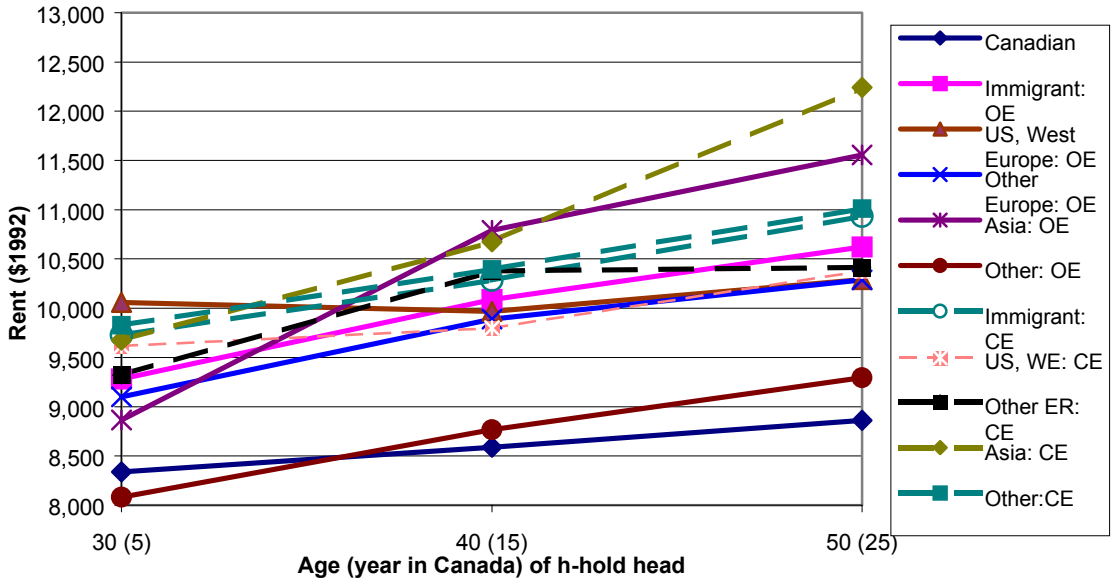


Figure 21: Predicted Rent by Age and Origin (at Own and Canadian Endowments: OE and CE)



Groups at Risk in the Housing Market[86]

Since I just demonstrated that immigrants in general enjoy a greater expenditure level on shelter, I turn to selected groups at risk to extend my analysis. An obvious group at risk consists of households whose income is at or below the subsistence level. Other possible groups at risk are single parent households, seniors, single women, etc. Recent immigrants themselves have also been named as a group at risk in the housing market. Thus, two pertinent questions arise. Does being a female and an immigrant create a double jeopardy for shelter demand? Is the immigrant single parent household also at a greater risk?

Housing Expenditures of Poor vs. Rich Canadian Households

Given my alternative definitions for low- and high-income households In Canada (see Appendix K), Tables 15 and 16 report their shelter demand functions and associated coefficients.[87]

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[86] A slightly different specification of housing demand is going to be used in the rest of the paper. "Average" income is used as a proxy for permanent income. It is the average of predicted income and current income before taxes.

[87] Estimations of owner equations can be obtained from the author upon request. Low-income immigrants' predicted values of dwellings significantly exceed those of low-income Canadian households. Income elasticities of low-income owners of various definitions vary substantially: 0.19 to 0.35. However, sample sizes of low-income owners are quite small and yield many insignificant coefficients.

Table 15: Estimated Demand Coefficients for the Sample of Low-income Renters

According to	Sarlo (2001) poverty lines		Low Income Cut-Offs		Social Assistance Indicator	
Coefficient	Canadian	Immigrant	Canadian	Immigrant	Canadian	Immigrant
N	**488**	**143**	**1379**	**253**	**1089**	**160**
R	0.0755	0.1811	0.0965	0.1806	**0.1541**	**0.1982**
ln(average income)	**0.39**	*0.15*	**0.39**	*0.13*	**0.37**	**0.44**
Ln (CPI)	**-1.03**	*-0.19*	**-0.76**	*-0.45*	**-0.24**	*-0.46*
Age	*0.0009*	**-0.007**	*0.0017*	**-0.008**	**-0.002**	-0.0013
family size	*0.01*	**0.07**	*0.003*	-0.02	*-0.0066*	-0.015
Male	*-0.11*	*0.07*	**-0.07**	0.006	**-0.07**	-0.028
Single	**0.16**	**-0.32**	**0.09**	-0.14	**0.08**	-0.023
Married	**0.24**	*-0.02*	**0.096**	0.18	**0.09**	0.012
Mills	*0.06*	*0.017*	*0.05*	-0.03	*-0.006*	-0.073
years since migration	**n/a**	*0.0032*	**n/a**	-0.007	**n/a**	-0.0007
years square	**n/a**	*0.00013*	**n/a**	0.0002	**n/a**	-0.00002
Constant	**4.11**	**6.45**	**4.52**	**7.3**	**5.11**	**4.12**
Predicted housing expenditure[88]	**3,311**	**2,725**	**4,546**	**4,198**	**5,622**	**3,980**
Predicted at $45,000 income	**4,840**	**3,154**	**6,645**	**4,764**	**8,059**	**6,108**

Table 16: Estimated Demand Coefficients for the Sample of High-income Renters

According to	Sarlo (2001) poverty lines		Low Income Cut-Offs		Social Assistance Indicator	
Coefficient	Canadian	Immigrant	Canadian	Immigrant	Canadian	Immigrant
N	**6827**	**1095**	**5936**	**985**	**4603**	**791**
R	0.1684	0.305	0.1541	0.3147	**0.1577**	**0.3433**
Ln(average income)	**0.29**	**0.28**	**0.32**	**0.35**	**0.36**	**0.35**
Ln (CPI)	**-0.32**	*-0.18*	**-0.32**	**-0.22**	**-0.39**	*-0.16*
Age	**0.0016**	*0.0016*	**0.0016**	*0.0006*	**0.003**	-0.0004
family size	**0.05**	**0.04**	**0.05**	**0.05**	**0.04**	**0.03**
Male	**-0.08**	**-0.082**	**-0.09**	**-0.09**	**-0.08**	**-0.07**
Single	*-0.02*	*-0.02*	**-0.04**	-0.03	*-0.004*	*-0.03*
Married	**-0.05**	*0.0023*	**-0.06**	-0.05	**-0.06**	*-0.007*
Mills	**-0.001**	**-0.0064**	**-0.001**	**-0.005**	*-0.0008*	-0.004
years since migration	**n/a**	**-0.0075**	**n/a**	-0.005	**n/a**	**-0.008**
years square	**n/a**	**0.00012**	**n/a**	0.0001	**n/a**	**0.0002**
Constant	**5.57**	**5.74**	**5.25**	**5.11**	**4.7**	**5.11**
Predicted housing expenditure[89]	**6,834**	**7,158**	**6,756**	**7,741**	**6,262**	**7,367**
Predicted at $45,000 income	**6,382**	**6,700**	**6,264**	**7,126**	**5,751**	**6,782**

[88] For a three member household with a married male 40-year-old head and 17,000 ($1992) yearly income.
[89] For a three member household with a married male 40-year-old head and 77,000 ($1992) yearly income.

Economic theory predicts that expenditures of the low-income population are less sensitive to changes in income (lower income elasticity), and more sensitive to changes in prices (higher absolute value of price elasticity). Observing estimated coefficients of low-income and high-income renters as defined by various definitions, it is obvious that most price elasticities have the expected order of magnitudes ($|\eta^{poor}|>|\eta^{rich}|$), but not the estimated income elasticities.

A final observation is that many socio-demographic variables are insignificant in low-income immigrant samples (unlike the complete sample). Economic variables, on the other hand, are very influential. Thus, crucial determinants of housing demand of low-income households are income and prices, not their socio-demographic characteristics.

Single Parent Households

A prime group at risk is single parent households and I report the interesting patterns that emerge from Table 22. According to separate regressions for immigrant and Canadian single parent households, male-headed lone-parent immigrant households occupy dwellings of lower value than female-headed lone-parent immigrant households (if given equal incomes). While a stylized female-headed immigrant household lives in a dwelling of a higher value than that of a comparable Canadian-born household (see predicted values), a stylized single-parent male-headed immigrant household occupies a dwelling of a lower value than that of a comparable single parent Canadian owner (Table 17). One should note a distinct difference in owner demand elasticities of Canadian and immigrant single parent renters – 0.17.[90]

[90] Since the restriction of equal coefficients for immigrant and Canadian lone-parent renters cannot be rejected, it can be concluded that they behave similarly.

Table 17: Owner and Rental Housing Demand by Single Parent Households

	Owners		**Renters**
Coefficient	Canadian	Immigrant	ALL
N	**463: all**	**20.00%**	**778: all**
R	**0.3524**	**r**	**0.166**
Ln (average income)	**0.28**	**0.45**	**0.38**
Ln (CPI)	**-0.7**	**-0.94**	**-0.84**
Ln (value-rent)	**1.12**	**1.12**	
Age	*-0.0024*	*-0.0024*	*-0.0003*
Age square	*0.00002*	*0.00002*	
Children	**-0.05**	**-0.05**	*0.02*
Male indicator	*-0.04*	**-0.29**	*0.03*
Mills ratio	**0.018**	**r**	-0.09
Immigrant dummy	**n/a**	**-1.72**	**n/a**
Years Since Migration		*-0.0009*	**n/a**
Constant	**5.46**	**5.46**	**4.66**
Male-headed household: predicted rent/value at 45,000 $1992	**114,650**	**98,380**	**6,565**
Female-headed household: predicted rent/value at $45,000 $1992	**119,329**	**131,477**	**6,371**

Female-headed households vs. male-headed households

Gender differences also appear in my results according to the tenure choice estimating equation (see Table 6): Canadian female-headed households have approximately 5 percent lower probability of homeownership than male-headed households. However, immigrant female-headed households do not seem to have a disadvantage in homeownership rate relative to immigrant male-headed households. Both Canadian and immigrant female-headed households spend more on rental shelter (negative coefficients on male indicator variables: see Table 13), while Canadian male-headed households have dwellings of lower value that Canadian female-headed households (see negative coefficient on male dummy: Table 13). Among male- and female-headed households immigrant households spend more on shelter (with the exception of female renter households: see Table 18).

Table 18: Selected Coefficients from Regressions for Male and Female Samples

Demand equation	Value-based owner		Expenditure- owner		Renter	
Gender of h-hold head	Male	Female	Male	Female	Male	Female
N	**8,802**	**2,886**	**2,507**	**659**	**4,428**	**4,125**
Ln (income)	**0.30**	**0.26**	**0.47**	**0.45**	**0.32**	**0.39**
Ln (price)	**-0.76**	**-0.74**	**-0.88**	**-0.78**	**-0.25**	**-0.50**
Immigrant Dummy	**0.16**	**0.16**	**0.23**	**0.27**	**0.06**	*0.03*
Years in Canada	*-0.0007*	*-0.002*	*-0.007*	*-0.01*	**-0.002**	*-0.0008*
Constant	**5.009**	**5.31**	**1.31**	**4.14**	**5.29**	**4.93**
Predicted at $45,000 income for Canadian h-hold	**116,544**	**109,782**	**7,195**	**8,010**	**6,219**	**6,308**
Predicted at $45,000 income for immigrant h-hold	**136,288**	**127,548**	**8,744**	**9,980**	**6,538**	**6,474**

CONCLUSIONS

Having compared homeownership patterns and demand for housing by immigrant and non-immigrant households, a number of important conclusions arise. First, the majority of the difference in the probabilities of homeownership between Canadian-born and foreign-born households arise from factors other than endowments, namely discrimination, differential tastes and preferences, lack of credit record, etc. (especially in the case of "recent" immigrants). When differential endowments do matter (i.e. in homeownership probabilities between Canadian and older vintages of immigrant households) the magnitudes of these differences are quite small.

Secondly, probabilities of homeownership decrease eventually at the end of the life cycle (see Figures 14–16). Shamsuddin and DeVoretz (1998) observe that wealth holdings decrease via sale of homes at the end of the life cycle, but this decrease in homeownership is perhaps delayed for Canadians who have guaranteed pensions. Immigrants, on the other hand, might dissipate their wealth faster in old age to finance their retirement consumption.

In addition, immigrant households' housing expenditures consistently exceed those of Canadian-born households in absolute and relative terms for 1984–1992 survey years. Marr and McCready (1986) reached this same conclusion with an older cohort of immigrants. When immigrant households are dissagregated by region of origin, "other European," Asian owners and owners from "other regions" have the highest valued dwellings. This result could be due to the inability to observe differences in immigrant classes (refugee, independent, investor, family reunification, etc.) across immigrant origins. It should be noted that most immigrants of investor category come from Asia and invest more heavily in housing than other groups.

Moreover, there is little evidence of convergence of immigrant and Canadian expenditures on shelter. Although in some case the coefficients on years since migration indicated assimilation to the Canadian norm, simulations at age for stylized Canadian and immigrant household show little or no convergence.

One further substantial conclusion arises if we combine two facts. Since immigrants' incomes are on average lower than those of Canadian-born and immigrants' housing expenditures exceed those of non-immigrants, the existing positive gap in expenditures must be explained by factors other than differential endowments of permanent income. For example, tastes and discrimination might differ by foreign birth status. Given that the coefficient on the value-rent ratio is greater for some immigrant groups (e.g. "Other Europeans") this implies that these immigrant households are more likely to invest in their dwelling as an asset.

It is clear that endowments in the broadest sense account for a very small percent of the difference between dwelling values of recent immigrant and Canadian households, while they account for 43 percent of the difference in dwelling values of old immigrant and Canadian households. Likewise, endowments explain less than half of the gap in expenditures on owner housing by immigrant and Canadian households. However, endowments account for all of the difference in average rent expenditures between recent immigrant and Canadian households, and 37 percent between old immigrant and Canadian households.

What of households at risk? I find that economic variables dominate socio-demographic variables in the shelter demand functions for low-income (immigrant) households. According to my estimates, low-income immigrant renters spend less on housing than Canadian households and high-income immigrant renters spend more on housing when given the same incomes as Canadians.

While a stylized female-headed immigrant household lives in a higher valued dwelling than the representative Canadian-born household, a stylized single-parent male-headed immigrant household occupies a dwelling of a lower value than that of a representative single parent Canadian owner. One should note a distinct difference in owner demand elasticities of Canadian and immigrant single parent renters – 0.17.

While differential income levels can explain up to a half of the difference in the homeownership patterns between Canadian and some recent immigrant households (e.g. Asians), factors other than differential income endowments explain all the difference between their expenditure patterns. These factors include discrimination, as well as differential tastes and

preferences, including their tastes to remit money for household consumption in their country of origin. For instance, it has been suggested that many immigrants from Africa invest in housing in their home country and thus postpone or choose not to acquire homeownership in their new country of residence.

Finally, limited policy implications follow from the findings of my research. Foreign-born people in general do not need subsidies for housing, since they are able to assimilate into the Canadian norm of homeownership, and even surpass it eventually. They also spend more on owner and rental shelter on average than respective Canadian households. However, some subsidy programs could be designed for specific immigrant groups. For instance, older immigrant arrivals and immigrants from Africa and Latin America on average do not catch up to the Canadian level of homeownership and require special attention. One of the target groups, which was difficult to isolate in my data, could be refugees, as most of them come from "other" regions of the world. My methodology could devise the required subsidy to overcome any endowment effect.

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APPENDIX A: ELASTICITY ESTIMATES

Table 1A: Income and Price Elasticity Estimates from Previous Studies (1984–2000)

Author (year, country)	Income elastic. estim.	Price elastic. estim.	Estimation technique employed	Type of data used	House-holds sampled	Measure of income
Lapointe (1984) Montreal	O_{yp}=0.14 O_{yo}=0.12 O_{yp}=0.72 O_{yo}=0.72	O_{py}=-1.83 O_{py}=-1.66	LL, dep.var. - log(price), HEP price incl/excl	Cross-section (individual)	Mixed	C C and equity
Lapointe (1984) Montreal	O_{yp}=0.24 O_{yo}=0.20 O_{yp}=0.39 O_{yo}=0.33	O_{py}=-1.83 O_{py}=-1.91	LL, dep.var. - log(price), HEP price incl/excl	Cross-section (individual)	Mixed	P1: based on past income P2: average of past and present incomes
Lapointe (1984) Montreal	O_{yp}=1.04 O_{yo}=1.06 O_{yp}=1.24 O_{yo}=1.26	O_{py}=-1.38 O_{py}=-1.45	LL, dep.var. - log(price), HEP price incl/excl	Cross-section (individual)	Mixed	P1 and equity P2 and equity
Lapointe (1984) Toronto	O_{yp}=0.09 O_{yo}=0.10 O_{yp}=0.35 O_{yo}=0.36	O_{py}=-0.07 O_{py}=-0.20	LL, dep.var. - log(price), HEP price incl/excl	Cross-section (individual)	Mixed	C C and equity
Lapointe (1984) Toronto	O_{yp}=0.14 O_{yo}=0.16 O_{yp}=0.21 O_{yo}=0.23	O_{py}=-0.11 O_{py}=-0.13	LL, dep.var. - log(price), HEP price incl/excl	Cross-section (individual)	Mixed	P1: based on past income P2: average of past and present incomes
Lapointe (1984) Toronto	O_{yp}=0.42 O_{yo}=0.44 O_{yp}=0.55 O_{yo}=0.56	O_{py}=-0.26 O_{py}=-0.30	LL, dep.var. - log(price), HEP price incl/excl	Cross-section (individual)	Mixed	P1 and equity P2 and equity
Lapointe (1984) Montreal	O_{yp}=0.08 O_{yo}=0.06 O_{yp}=0.47 O_{yo}=0.48	O_{py}=-1.91 O_{py}=-1.81	LL, dep.var. - log(expend), HEP price incl/excl	Cross-section (individual)	Mixed	C C and equity
Lapointe (1984) Montreal	O_{yp}=0.18 O_{yo}=0.14 O_{yp}=0.29 O_{yo}=0.23	O_{py}=-1.92 O_{py}=-1.98	LL, dep.var. - log(expend), HEP price incl/excl	Cross-section (individual)	Mixed	P1: based on past income P2: average of past and present incomes
Lapointe (1984) Montreal	O_{yp}=0.72 O_{yo}=0.75 O_{yp}=0.85 O_{yo}=0.88	O_{py}=-1.61 O_{py}=-1.66	LL, dep.var. - log(expend), HEP price incl/excl	Cross-section (individual)	Mixed	P1 and equity P2 and equity
Lapointe (1984) Toronto	O_{yp}=0.11 O_{yo}=0.12 O_{yp}=0.31 O_{yo}=0.32	O_{py}=0.21 O_{py}=-0.30	LL, dep.var. - log(expend), HEP price incl/excl	Cross-section (individual)	Mixed	C C and equity
Lapointe (1984) Toronto	O_{yp}=0.11 O_{yo}=0.12 O_{yp}=0.21 O_{yo}=0.23	O_{py}=0.21 O_{py}=-0.26	LL, dep.var. - log(expend), HEP price incl/excl	Cross-section (individual)	Mixed	P1: based on past income P2: average of past and present incomes
Lapointe (1984) Toronto	O_{yp}=0.29 O_{yo}=0.31 O_{yp}=0.44 O_{yo}=0.45	O_{py}=-0.32 O_{py}=-0.37	LL, dep.var. - log(expend), HEP price incl/excl	Cross-section (individual)	Mixed	P1 and equity P2 and equity
Goodman (1988)	O=0.21 R=0.13 O=0.17 R=0.08	O=-0.45 R=-0.09 O=-0.50 R=-0.15	Heckman two-stage: no HC, with HC	Cross-sectional (individual)	Mixed	Permanent: fitted value of current income on LCC
Goodman	O=0.29	O=-0.53	Heckman 2-S:	Cross-sectional	Mixed	Current

(1988) USA	R=0.20	R=-0.24	with HC	(individual)		
Goodman (1988) USA	O=0.31 R=0.13	O=-0.50 R=-0.09	MLE: no HC	Cross-sectional (individual)	Mixed	P: fitted value of CI on LCC
Grootaert et al (1988) Ivory Coast cities	R=0.60-0.64	R=-0.46-0.54 (linear specific)	Two-stage: Probit+LL Rent eq.	Individual	Mixed	Permanent: expenditure as a proxy
Harmon (1988) USA	O=0.77 O=0.80 O=0.72 O=0.71	N/A	Log-linear regression with HC, PR, I	Panel (individual)	Mixed	P: 3-period lagged, fitted value of CI on LCC, average past, group median
Harmon (1988) USA	O=0.79 O=0.81 O=0.72 O=0.70	N/A	Log-linear regression with HC, PR, I	Panel (individual)	Non-mover	P: 3-period lagged, fitted value of CI on LCC, average past, group median
Harmon (1988) USA	O=0.95 O=1.10 O=1.05 O=0.96	N/A	Log-linear regression with HC, PR, I	Panel (individual)	Recent mover	P: 3-period lagged, fitted value of CI on LCC, average past, group median
Harmon and Potepan (1998)	O=0.83 O=0.86	O=-0.27 (not sign.) O=-0.10 (not sign.)	LL w/w-out correction for probability of moving	2-period panel (individual)	Recent mover, continuing homeowner	P: four-year average of real taxable income
Harmon and Potepan (1998)	O=0.68	O=-0.64	LL	2-period panel (individual)	Mixed, continuing homeowner	P: four-year average of real taxable income
Glennon (1989) USA	O=1.21	Short run: O=-.58 Long run: O=-1.07 Interest el.: O=-0.37	Structural e-s for flow, qua-ty, price, investment demand – two-stage est.	Time-series (aggregate)	Mixed	Per household real income
Rosenthal (1989) UK	O=0.63 O=0.81 O=0.75 O=0.78	O=-0.44 O=-.050 O=-0.43 O=-0.50	WLS, WCM, FUM, ECM w/ HEP	Panel (regionally aggregated)	Mixed	C
Rosenthal (1989) UK	O=0.67 O=0.68	O=-0.44 O=-0.43	L-L OLS, L-L CM	Panel (individual)	Mixed	C
Jones (1990) Canada	O_{pi}=0.14 O_{nw}=0.41	N/A	OLS of market value on PI, TI, NW, etc.	Cross-sectional (individual): 1977 and 1984	Young home owners (18-34 y.o.)	Permanent (PI) and transitory (TI) measures of income. Current net wealth variable (NW).
Jones (1990) Canada	O_{pi}=0.27 O_{nw}=0.52	N/A	OLS of market value on PI, TI, NW, etc.	Cross-sectional (individual): 1977 and 1984	Affluent young home owners	Permanent (PI) and transitory (TI) measures of income. Current net wealth variable (NW).
Jones (1990) Ontario	O_{pi}=0.12 O_{nw}=0.46	N/A	OLS of market value on PI, TI, NW, etc.	Cross-sectional (individual): 1977 and 1984	Young home owners	Permanent (PI) and transitory (TI) measures of income. Current net wealth variable (NW).
Jones (1990) Québec	O_{pi}=0.35 O_{nw}=0.30	N/A	OLS of market value on PI, TI, NW, etc.	Cross-sectional (individual): 1977 and 1984	Young home owners	Permanent (PI) and transitory (TI) measures of income. Current net wealth variable (NW).
Gandil (1995) Saudi Arabia	R=0.52 R=0.47	N/A	Log-linear equation w I and HC	Cross-sectional (individual)	All, Saudi h-holds	P: average of CI for the past 5 years
Winter-bottom et al.	O=0.28-0.32		L-L OLS	Cross-sectional (individual)	Mixed	

(1996) Moscow	R=0.05-0.14					
Hansen J. et al (1998) USA	O=0.51 R=0.35 O=0.36 R=0.28 O=0.35 R=0.27	N/A	Lorenz concentr., OLS w/ I and Q, 2 stage w/ I, Q, HC	Cross-sectional (individual)	Mixed	P: fitted regression of CI on LC
Tiwari P. et al (1998) Bombay	R=1.07 O=1.18 A=1.12	R=-1.02 O=-0.85 A=-1.2	L-L OLS HEP	Cross-sectional (individual)	Mixed	P: fitted regression of CI on LC
Nese A. (1999) Italy	O=0.61	O=-0.53	Two-stage Heckman procedure, HEP	Cross-sectional (individual)	Mixed	C
Charlier E. et al (2000) Holland	O=0.52 R=-0.24 O_{ML}=0.53 R_{ML}=1.5 O=-0.04-0.51 R=-0.14-0.34	N/A	budget shares regressed on lexp & $lexp^2$/ ML assuming lexp - end.// semi-parametric	Cross-sectional (individual)	Mixed	Proxy for income: expenditure
Tiwari P. et al. (2000) Japan (Tokyo)	R=0.31	R=-0.09	L-L OLS	Cross-sectional (individual)	Mixed	P: weighted avera-ge of fitted regres-sion of CI on LC and CI

* R, O, A – renters, owners, all.
* HC – household characteristics variables
* Q – quantity of housing
* LC – life-cycle characteristics
* P- permanent
* I – income
* PR - price
* CI – current income
* WLS – weighted least squares
* WCM – weighted covariance model
* FAM – full autoregressive model
* ECM – error components model
* HEP – hedonic estimation of price indexes
* L-L – log-linear
* CM – covariance model
* lexp – log (expenditure)

Source: Table 1 is the author's summary of previous housing demand studies.

APPENDIX B: DATA MANIPULATIONS

In total there exist 10,417 observations in 1996 FAMEX with 18.4 percent of these immigrant households. 332 (3.2%) observations have their province of residence masked (none of the immigrant households are among them). 900 (8.6%) households have no assigned area of residence (1.8 percent of immigrant observations among those). Since immigrants are not over-represented in these masked records I eliminate these observations from the sample.[91] Once "not-stated" education and occupation responses are filtered out from 1996 FAMEX, the new sample size is 8,664 observations with immigrant households constituting 19.7 percent (9.3 percent when a narrower definition[92] is used). 1992, 1990, 1986 and 1984 FAMEX data sets are filtered in a similar manner. The 1992, 1990, 1986 and 1984 filtered samples have sizes of 8472 (15.1 /12), 4213 (19.5/9.4), 9473 (15.8/7.3), and 4476 (20.9/10.3) respectively with the percentages of immigrant[93] households in the parentheses. While extensive, these family expenditure surveys have some weaknesses. The 1986, 1992 and 1996 surveys sampled both urban and rural households in the ten provinces of Canada, while in the 1984 and 1990 surveys, only urban households were sampled in Canada's 15 largest Census Metropolitan Areas (CMAs). The 1984 and 1986 surveys use "**spending unit**"[94] as a unit of analysis, while the other surveys (1990, 1992, and 1996) use **household**[95] as the unit of analysis. In order to create a consistent sample, I use only **urban**[96] observations and spending units or households that comprise a **single economic family**.[97]

APPENDIX C1: DESCRIPTIVE STATISTICS

Table 1C: Home Tenure by Selected Demographic and Socio-Economic Characteristics of Households (FAMEX 1996)

Characteristics	Sample Size	%Owned	%Rented
Province			
Nova Scotia	771	71.5	28.5
New Brunswick	619	72.7	27.3
Québec	1486	55.7	44.3
Ontario	2275	63.8	36.2
Manitoba	576	68.4	31.6
Saskatchewan	818	71.3	28.7
Alberta	745	71.9	28.1
British Columbia	1342	62.8	37.2
Size of Area of Residence			

[91] An alternative way of dealing with the problem of missing observations is predicting them. This route, however, turned out to be very time-consuming and did not yield credible results.

[92] A narrower definition of *an immigrant household* will be used for comparison: both spouses are immigrants.

[93] Immigrants that arrived in Canada at an age less than 15 are filtered from the sample. The rationale is that they assimilate quickly and do not differ from Canadians in their behavior.

[94] A family or an unattached individual living in a private household.

[95] A person or a group of persons occupying one dwelling unit.

[96] Urban observations are defined as households living in cities with 100,000 or more residents.

[97] An economic family is defined as an unattached individual or a group of people, related by blood, marriage or adoption, who live together in a household.

City (more than 30,000)	6935	62.5	37.5
Town (under 30,000)	845	66.4	33.6
Rural	1137	84.8	15.2
Household Composition			
One person	2145	41.4	58.6
Married couple only	2099	77.3	22.7
Married couple with kids	2898	82.6	17.4
Married couple with (non)-relatives	463	84.4	15.6
Lone parent family	704	34.2	64.8
Other households with non-relatives	316	58.2	41.8
Other non-married couple	292	34.2	64.8
Family Size			
2	2844	67.7	32.3
3	1471	70.6	29.4
4	1551	82.6	17.4
5	645	82.5	17.5
6	261	74.7	25.3
Age			
<34	1851	41.3	58.7
35-44	2265	69.6	30.4
45-54	1774	77.3	22.7
55-64	1144	77	23
>64	1883	67.3	32.7
Gender			
Male	5615	73.5	26.5
Female	3302	52.5	47.5
Education			
Less than 9 years of schooling	1118	61.3	38.7
Some or completed high school	3600	62.8	37.2
Post-secondary	610	62.8	37.2
Post-secondary certificate or diploma	2162	69.7	30.3
University	1423	72.1	27.9
Household Income			
Less than 10,000	395	26.1	73.9
10,000-30,000	3307	46.5	53.5
30,000-50,000	2716	73.2	26.8
More than 50,000	2499	89.3	10.7

APPENDIX C2: DESCRIPTIVE STATISTICS

One should note a systematic relationship between age of the head of the household and average housing budget shares, as well as value of the occupied dwelling and rent (see Figures 3 and 4, as well as 3a, 3b and 4a).

Figure 3: Mean Consumption Shares of Owner Housing Expenditures by Age Group and Country of Birth

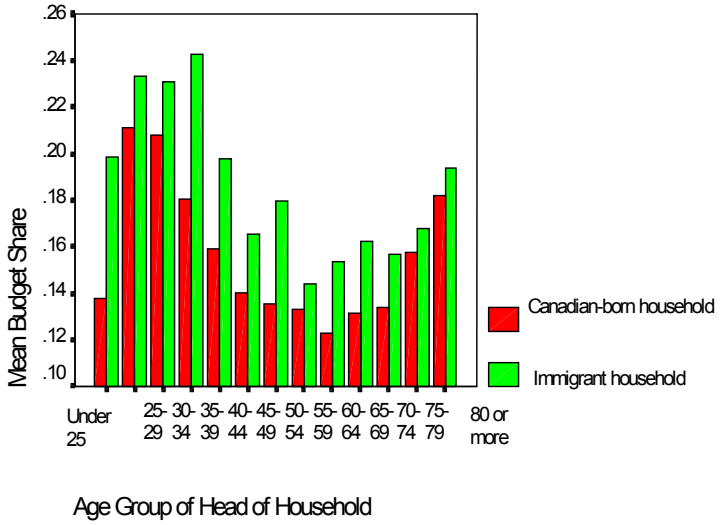


Figure 3a: Mean Consumption Shares of Owners' Expenditures

sample of owners with a mortgage

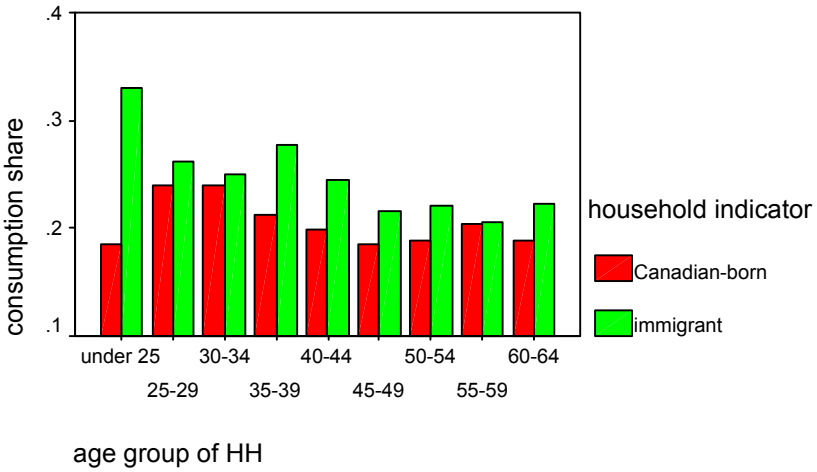


Figure 3b: Mean Value of Dwelling by Age and Origin

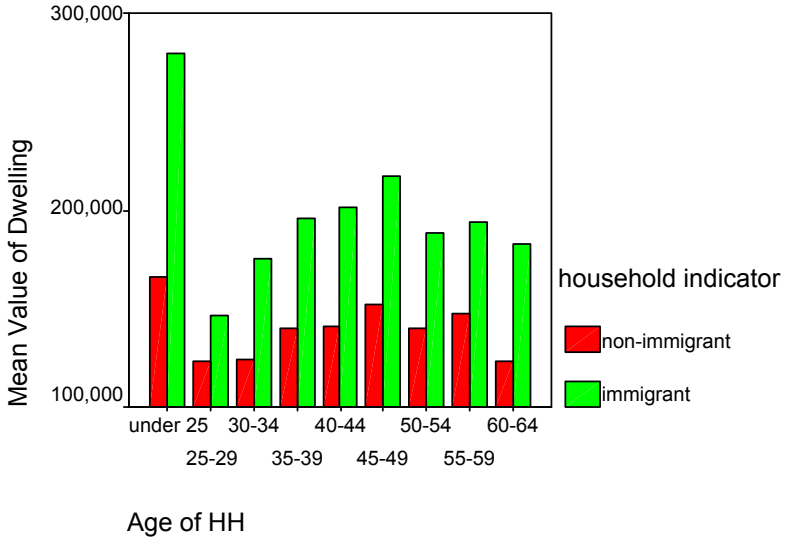


Figure 4: Mean Consumption Shares of Rental Expenditures

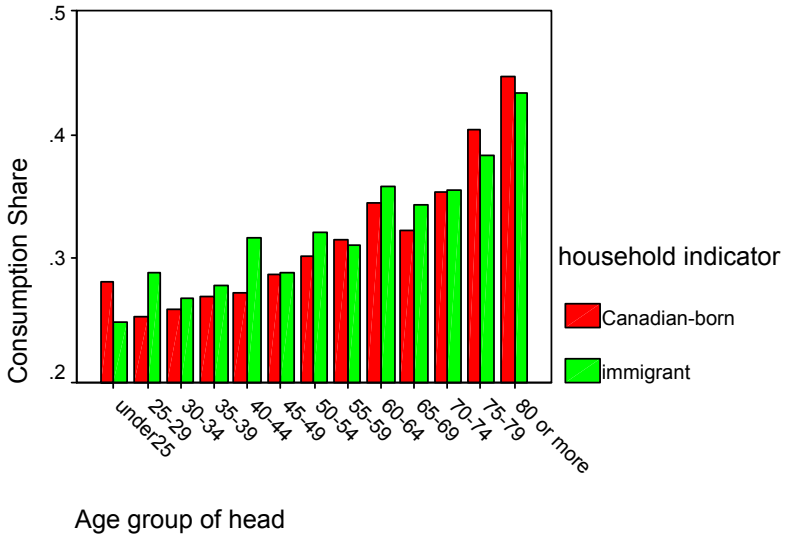
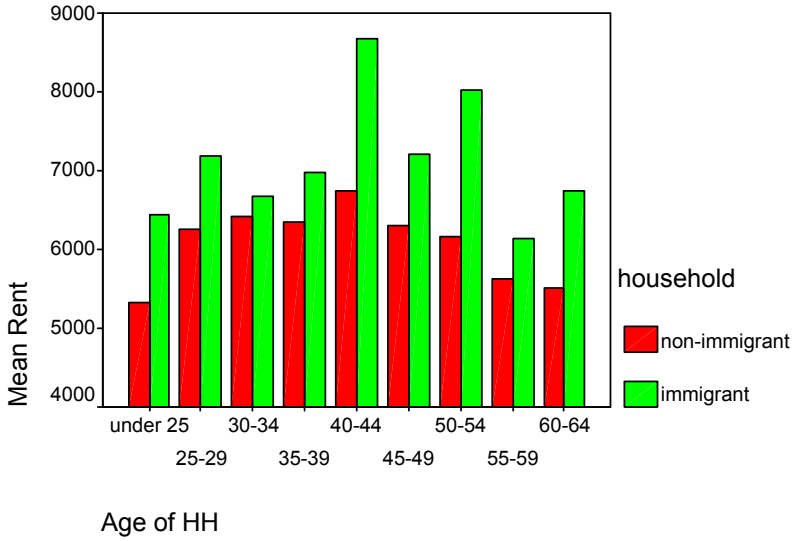


Figure 4a: Rent by Age and Origin

(FAMEX 1996, $1996)



The average consumption share spent on owned living quarters appears to be *decreasing* in age (at least in the first half of life span: Figure 3 and 3a), while dwelling values are concave in age peaking around 45–49 years old (Figure 3b). Regarding rental housing, the average budget shares seem *to increase* monotonically with the age of the head of the household (Figure 4), while rent is concave in age. Similar trends are observed when a narrower definition[98] of immigrant household is used.

[98] A narrower definition of *an immigrant household* is used for comparison: both spouses are immigrants.

Figure 5: Mean Consumption Shares of Owner Housing Expenditures by Income Level and Place of Birth

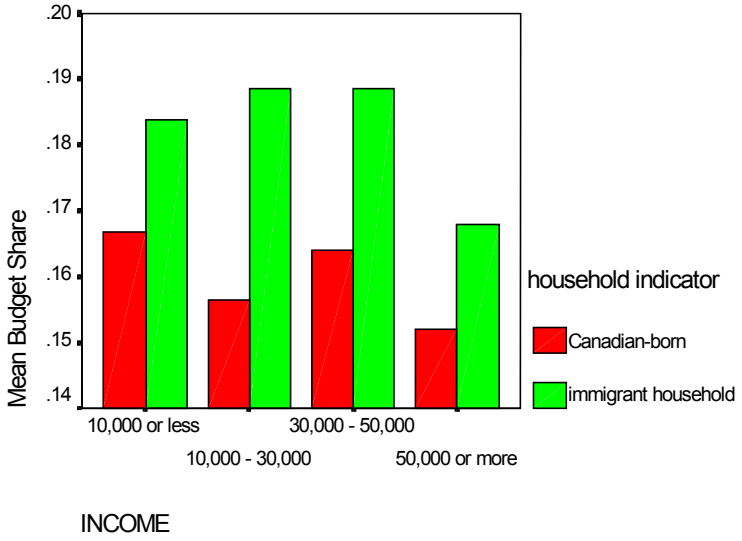


Figure 5a: Mean Consumption Shares of Owner Housing Expenditures

sample of owners with a mortage

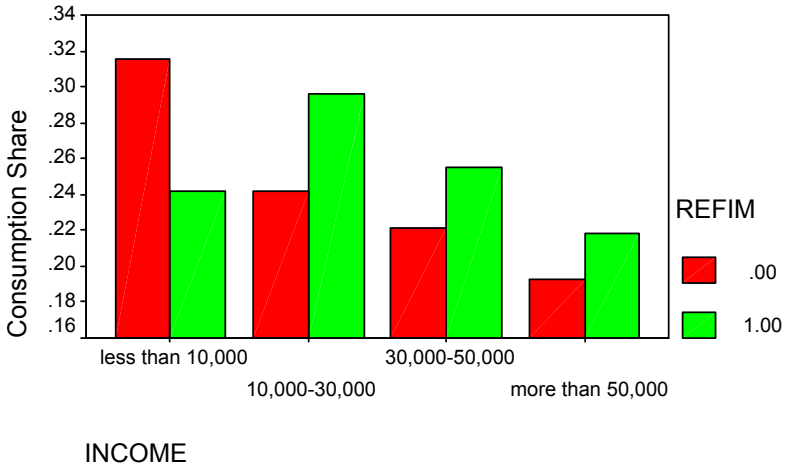
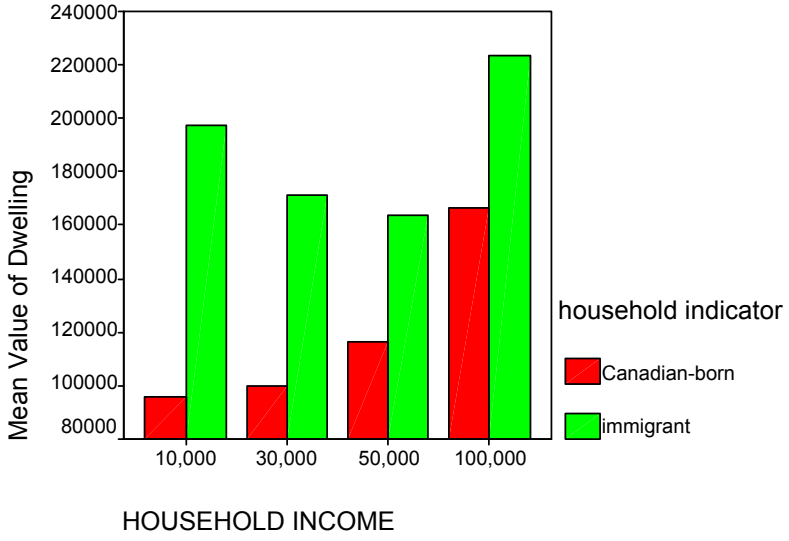


Figure 5b: Mean Value of Dwelling by Income and Origin



Households with higher income spent a smaller share of their budget on housing (see Figures 5, 5a and 6). This negative relationship between income levels and average budget shares is especially obvious for the consumption shares of expenditures on rental units (Figure 6) and expenditures of owners with mortgage. On the contrary, there exists a positive relationship between income levels and absolute housing expenditures (especially rented). Immigrants' absolute expenditures on owner housing do not follow the Canadians' pattern of expenditures by income levels, according to Figure 5b. Similar relationships are observed between housing consumption shares and education.[99] Of course, this is expected, as income and education are highly collinear.

[99] Figures can be obtained from author upon request.

Figure 6: Mean Consumption Shares of Rental Housing Expenditures by Income Level and Place of Birth

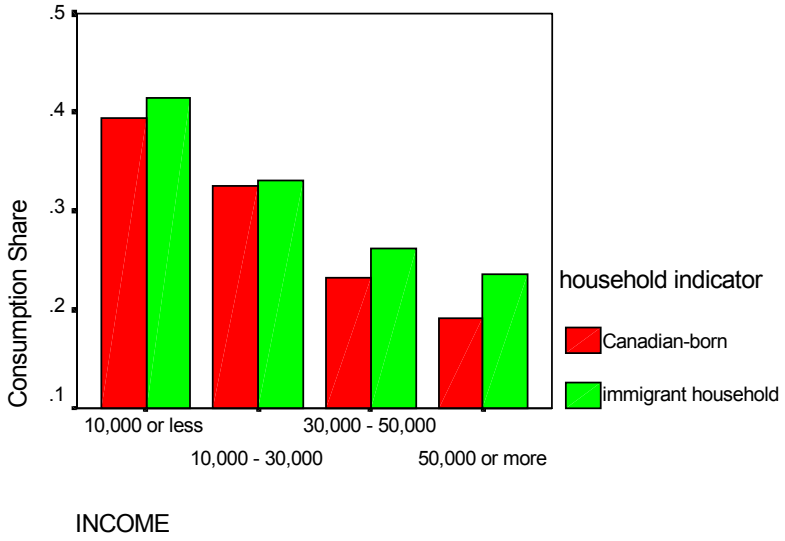
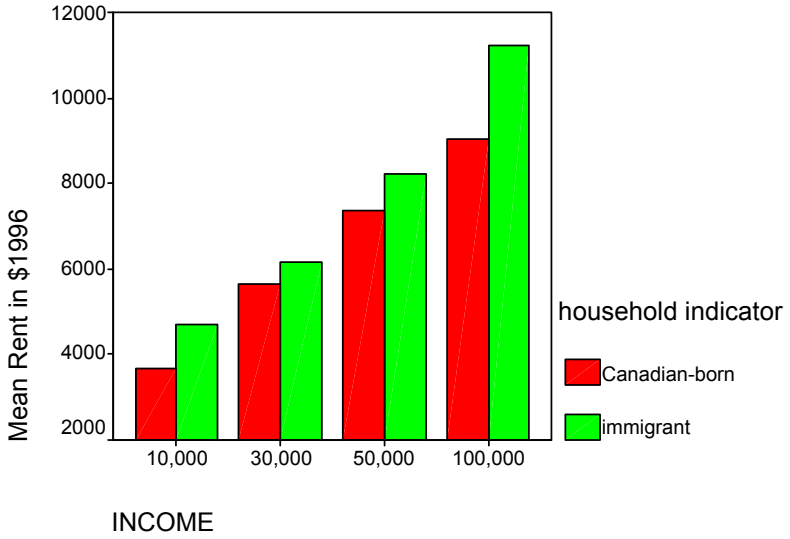


Figure 6a:

Mean Rent by Income and Origin

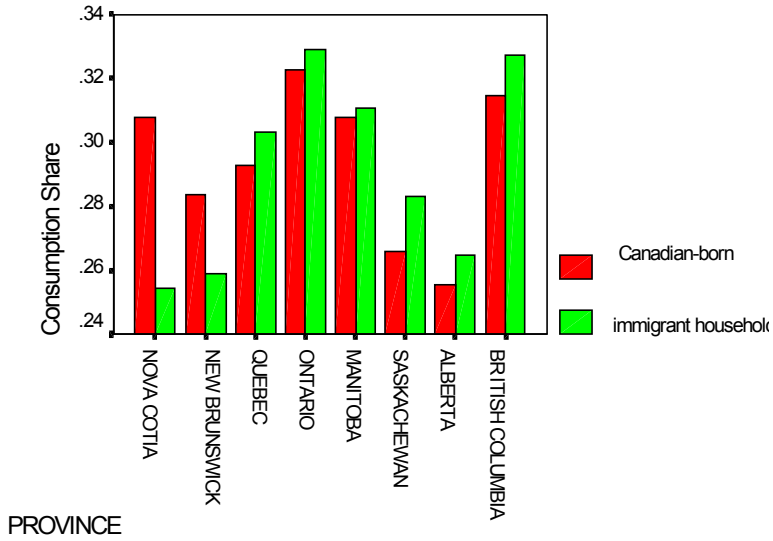


According to the descriptive analysis of other socio-demographic variables and housing expenditures,[100] male-headed households seem to spend a greater share of their consumption budget on housing and among both male and female-headed households immigrant households

[100] Figures can be obtained from author upon request.

spend a larger share of their consumption budget on housing than do Canadian-born households. Married couple households spend a smaller share of their income on housing than do other types of households. One-person households spend the largest share of their consumption budget on housing among households of varying family sizes. In case of rental housing, there is a pronounced negative relationship between the number of people in a household and the average consumption share spent on housing. Across households grouped by family size immigrant households spent a larger share of their budget on housing than non-immigrant households.

Figure 7: Mean Consumption Shares of Rental Housing Expenditures by Province of Residence and Place of Birth



Budget shares spent on housing also vary by region of residence and size of area of residence (see Figures 7 through 10). Same trends are observed in absolute expenditures on rental and owner housing (variations in rent and value of dwelling).[101] Households residing in Ontario and British Columbia spend the largest budget shares and absolute dollar amounts on both rental and owned living quarters. The average budget share spent on owned living quarters decreases as the size of area of residence declines (Figure 9).

[101] Figures can be obtained from author upon request.

Figure 8: Mean Consumption Shares of Owner Housing Expenditures by Province of Residence and Origin

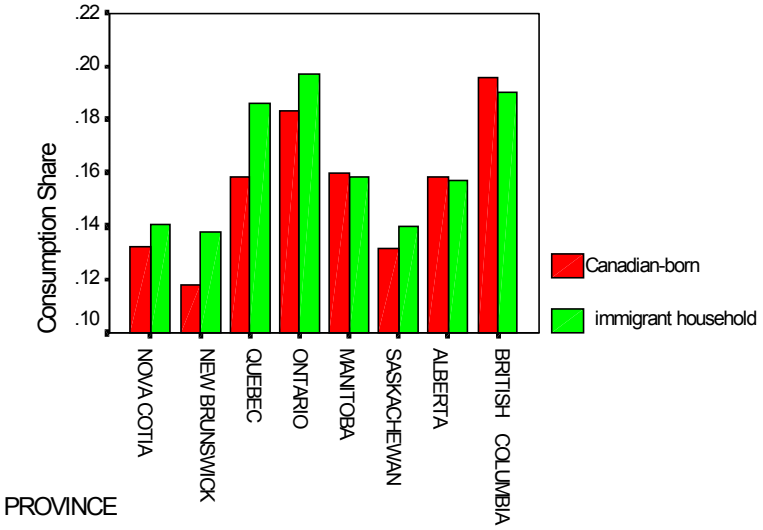


Figure 9: Mean Consumption Shares of Owner Housing Expenditures by Size of Area of Residence and Origin

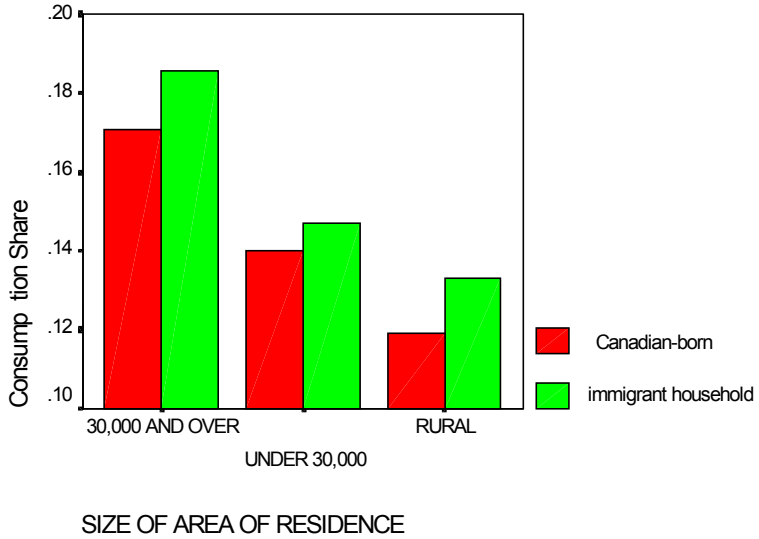
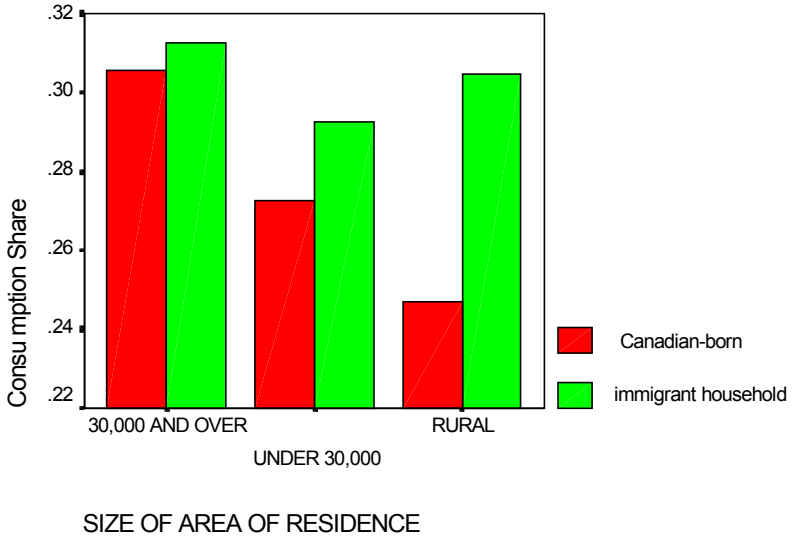


Figure 10: Mean Consumption Shares of Rental Housing Expenditures by Size of Area of Residence and Origin



APPENDIX D: PRICE INDICES

For example, the base category for the inter-regional CPI presented in Table 4 is British Columbia in 1992, hence both rental and owner housing CPI takes value 1 for British Columbia housing in 1992. The value of owner housing in Ontario in 1990 is 0.98, which is antilog[102] of the coefficient on the interaction of Ontario indicator and 1990 year dummy from the owner housing equation.

APPENDIX E: IMR

It accounts for correlation between errors in the demand equations and error in the tenure choice equation. Its coefficient would measure the correlation between the error terms in the demand equation and the tenure equation times the standard deviation of the normal untruncated distribution (Kennedy 1996).

APPENDIX F: CALCULATING OPPORTUNITY COST

These estimates were obtained as follows. First logit regressions (presented in Table 6) were run. Then estimates of the coefficients were used in order to estimate probabilities of owning for immigrant households (PI) at the mean relative price, value-rent ratio, wealth (for all households), predicted earned income and corresponding age groups (3 categories). Then same technique was applied to calculated probabilities of owning at the Canadian average income: PC. Then I solved these equations for the additional income necessary to equate probabilities of homeownership of the immigrant households to those of the Canadian households. For instance, the predicted earnings of the Canadian households with 30-year-old head of the household are Y, and the predicted earnings of the representative "recent" immigrant households is X. The following equation estimates probability of owning for Immigrant households: **P= constant + α Earnings + s Wealth+ β Value Rent Ratio + γ Relative Price + δ Family Size + ζ *Male* + η Married + *θ Single* + ι Age of HH + κ Age Square + λ Years Since Migration + (μ Years Square) + *ν***

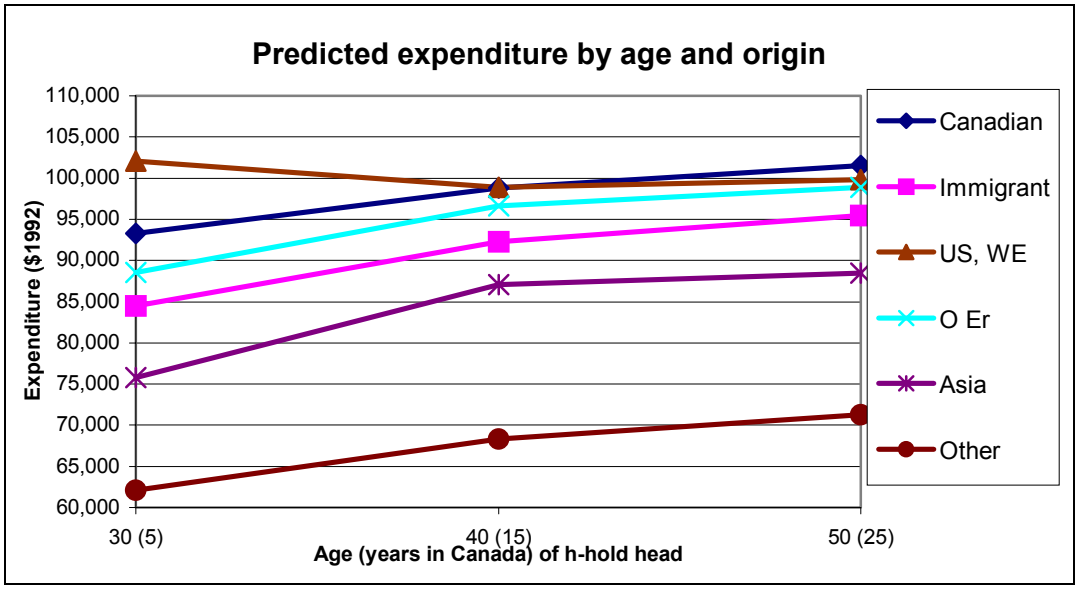
[102] Exponent to the degree (of the coefficient).

***Atlantic region* + ξ Québec + o Ontario + *π Prairies* + ε.** The probability of owning for a 3 member Canadian household with a 30-year-old head of the household is equal to 0.864. The probability of owning for a representative newly arrived immigrant household is equal to 0.622. So the difference in their probabilities is 0.242. The difference decreases to 0.156 when the probability of homeownership for this immigrant household is estimated using the predicted Canadian income Y. An income increase of $63,541 ($1992) is necessary for this immigrant household to have 0.864 probability of homeownership (given endowments of the representative Canadian household). Thus $63,541 is the opportunity cost of owning for this immigrant household.

APPENDIX G: TESTING RESTRICTIONS

The restrictions have been tested by means of F-tests: ((SSEr-SSEu)/Q)/(SSEu/(N-K), where Q – number of restrictions, N – sample size, and K – number of independent variables in the unrestricted equation, SSEr – sum of squared errors from the restricted regression and SSEu – from the unrestricted regression. The restrictions proved to be valid for the expenditure-based owner demand regressions[103]. Only the restrictions on coefficients on the economic variables in value-based owner demand equations could not be rejected with a credible level of confidence (5% significance level). The restrictions on all the coefficients in the immigrant rental shelter equation were rejected.

APPENDIX H: FIGURE: Predicted Household Expenditure by Age and Origin



[103] Chow-test statistic was insignificant.

APPENDIX I: DECOMPOSITION AT MEANS

Table 1I below presents predicted housing expenditures calculated at mean endowments (income, value-rent ration, age, share of male-headed married households) for Canadian, recent immigrant and old immigrant households.

Table 1I: Housing expenditures by origin (predicted at Canadian and immigrant mean endowments, and mean values of other variables)

	Predicted value	Predicted owner expenditure	Predicted rent
Canadian	**106,079**	**5,649**	**6,749**
Recent immigrant – own endowments	**133,416**	**11,074**	**6,716**
Recent immigrants – Cdn endowments	**134,021**	**9,340**	**6,995**
Old immigrant – own endowments	**153,720**	**7,586**	**6,580**
Old immigrants – Cdn endowments	**133,291**	**7,362**	**6,642**

It is clear that endowments account for a very small percent of the difference between dwelling values of recent immigrant and Canadian households, while they account for 43% of the difference in dwelling values of old immigrant and Canadian households. Endowments explain less than half of the gap in expenditures on owner housing by immigrant and Canadian households. Endowments account for all of the difference in rent expenditures between recent immigrant and Canadian households, and 37% between old immigrant and Canadian households. Age-specific analysis will be performed by means of representative household comparisons further.

APPENDIX J: ROLES OF FACTORS OTHER THAN ENDOWMENTS

Table 1J: Share of the Difference in Shelter Consumptions Between Immigrant and Canadian Households Explained by Factors Other than Endowments

Value-based owner demand equation					
Age of HH (Years in Canada)	**Immigrant**	**US, Western Europe**	**Other Europe**	**Asia**	**Other Regions**
30 (5)	1.23	-4.19	1.06	1.55	1.74
40 (15)	1.17	0.99	1.03	1.24	1.65
50 (25)	1.17	0.67	1.04	1.23	1.63
Rental demand equation					
Age of HH (Years in Canada)	**Immigrant**	**US, Western Europe**	**Other Europe**	**Asia**	**Other Regions**
30 (5)	1.47	0.74	1.29	2.54	-5.81
40 (15)	1.13	0.88	1.38	0.95	9.99
50 (25)	1.18	1.06	1.09	1.25	4.96

APPENDIX K: LOW VS. HIGH-INCOME HOUSEHOLDS

Poor household vs. rich: various definitions of poor households

I use several definitions to separate households into low-income and high-income groups to identify groups at risk. The first definition used is Low-Income-Cut-Offs (LICO) as provided by Statistics Canada.[104] The low-income households in my sample are defined as those whose real before tax income is below the calculated LICO lines.

Another measure of poverty is basic needs poverty lines constructed by Sarlo (2001). It is an absolute measure of poverty (the consumption bundle does not change over time). The rationale for superiority of such a poverty measure can be found in Pendakur (2001). The "Sarlo-poor" households are those whose total consumption is below the relevant poverty line. Thus, these households are defined as poor according to their level of consumption not income.

A third instrument to help distinguish low-income households is household social assistance indicator (SAI) as provided by FAMEX. If any member of the household has received social assistance in the survey year that household is defined in this study as a low-income household.

Descriptive Statistics and Predicted Income of Low-Income Households

As can be seen from Table 1K below, Sarlo and LICO measures produce comparable results in terms of descriptive statistics of their samples. However, households on social assistance have a higher mean income than previously defined low-income households. Their family size is also significantly higher. While mean "average" income of low-income immigrant households exceeds that of Canadian households, the predicted earnings of a representative low-income immigrant household are below those of a representative low-income Canadian household (see Table 1K).[105] Thus, low-income immigrant households' capacity to spend on shelter is below that of low-income Canadians. Female-headed households constitute a larger share of low-income Canadian households, while approximately the same number of male- and female-headed immigrant households are poor (across all three definitions).

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[104] Not a poverty measure as noted by Statistics Canada. However, it can be considered a relative measure of poverty in order to single out low-income households.

[105] In the sample of Sarlo poor households and households receiving social assistance, immigrant dummy has a significant negative coefficient, and years since migration significant positive coefficient.

Table 1K: Mean Values of Some Variables for Various Samples of Low-Income Households (income in $1992)

LOW-INCOME households	***Sarlo poverty lines***		***LICO***		***SAI***	
	Canadian	**Immigrant**	**Canadian**	**Immigrant**	**Canadian**	**Immigrant**
	694	**255**	**1723**	**368**	**1324**	**227**
Mean Age of HH	51.9	62.1	48	55.1	42.7	51.7
Mean Family Size	2.18	2.15	2.04	2.24	2.57	2.73
Share of Male Heads	0.37	0.525	0.33	0.50	0.37	0.55
Mean Income before Taxes	11,114	15,159	11,517	12,080	20,393	22,388
Mean Average Income	12,884	14,969	13,276	14,568	20,097	21,595

In addition, one can note from Table 1K that a notably larger share of immigrants is poor according to the consumption criterion than the low-income criterion.

Table 2K: Predicted household earnings for poor (Sarlo) households[106] and households receiving social assistance (SAI)

	Sarlo		SAI	
Age of HH	Canadian	Immigrant	Canadian	Immigrant
Recent immigrant - 30	20,970	16,908	35,017	29,070
Recent immigrant – 40	19,572	15,702	34,730	28,818
recent immigrant – 50	18,775	15,016	34,803	28,872
old immigrant - 40 -11 years in Canada		17,873		32,080
old immigrant - 50 - 21 years in Canada		18,427		33,908

As can be seen from Table 2K above, predicted earnings of households on social assistance are above the predicted earnings of households whose consumption is below Sarlo poverty lines. Social assistance indicator (SAI) denotes that at least one person has received social assistance in the survey year, while Sarlo and LICO measures denote that the whole household's income or consumption is below a threshold level. Thus, the sample of households on social assistance is larger, and could include more affluent households. However, many

[106] Income regressions (earnings) (with an immigrant dummy and years since migration variable) are run for the sample of poor households, and then household earnings are predicted. Base: head works 40 weeks full time, spouse works 20 weeks part time, child non-working, post-secondary diploma education, occupation in services. Significant coefficients on immigrant dummy and years since migration were obtained. Regressions with a sample of low-income LICO households produced similar estimates of income, except the coefficients on immigrant dummy and years since migration were not significant.

immigrants are not eligible for social assistance (for instance, sponsored relatives during their first 10 years in Canada). For this reason, immigrant households constitute only 14.6 percent of all households on social assistance, while they comprise 17.6 per cent of all LICO-low-income households and 26.9 per cent of Sarlo-consumption-poor households.

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