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Immigrant Expenditure Patterns on Transportation

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Immigrant Expenditure Patterns on Transportation

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Abstract

Recent Canadian immigrant expenditure studies focusing on housing, food, and health report distinct differences in expenditures by foreign-born status. This paper extends these expenditure studies by investigating the foreign and Canadian-born populations' transportation (public and private) expenditure patterns by region of origin and period of entry. There are significant differences in both the levels of transportation expenditure and also the division of expenditures between public and private transportation by foreign-born status. Furthermore, a life-cycle expenditure model is estimated to rationalize these different expenditure patterns between foreign-born and Canadian-born between 1984-1996.

JEL Classification: D10, R41

Key Words: transportation expenditures, life-cycle consumption analysis, expenditure elasticity, immigrants.

Introduction

Transportation, expenditures for the representative foreign-born household on average absorbed about 12% of total household expenditures and between 20% to 25% of total after tax income.¹ Thus any shifts in tastes and preferences, resulting from immigrant demand, which affect transportation expenditures can have a significant impact on retail sales in immigrant settlement areas. The goal of this paper is to firstly investigate the differences in transportation expenditure that might exist between foreign-born and Canadian-born, and also by region of origin. Secondly, the common variables in a life-cycle expenditure hypothesis will be analyzed to gauge their impact and significance and to see how they compare by region of origin and birth status.

This paper is organized as follows: the first part of the paper presents an over view of expenditure patterns of the entire Canadian population, the foreign-born, and the Canadian-born households to assess differences in expenditure patterns by foreign birth status. Next, foreigners are disaggregated into five subgroups to detect any differences in public and private transportation expenditure patterns by country or region of origin. The underlying hypothesis implied by disaggregation is that the foreign-born may have initially different transportation expenditure patterns owing to level of development or relative prices in the home country. Over time, however, assimilation or change in tastes may cause convergence in transportation expenditure patterns to a Canadian norm.

Finally, through regression analysis I estimate a life-cycle model to rationalize the difference in transportation expenditure by status. The results of the regressions are then used to simulate age transportation expenditure patterns over a households lifetime by foreign birth status, area of origin and length of stay in Canada.

Literature Review

The search for models that might explain the underlying demand factors for cars, trucks, and other forms of private transportation has spawned numerous studies. These studies range from Cragg and Uhler's (1970) general analysis of the demand for automobiles, to models used for forecasting energy crises as presented by Carlson and Umble (1980), to Wetzel and Hoffer's (1982) study of a disaggregated transport market. In addition Henshar, Milthorpe, and Nariida (1990) studied the effect of urban location on transportation demand, while Rippe and Feldman (1976) studied the impact of residential construction on the demand for automobiles. In sum, transportation demand modelling is wide ranging and eclectic.

This paper in turn offers another viewpoint, namely that differentiating Canadian and foreign-born household demand for transportation may explain changing demand patterns. I focus on household demand literature and their potential econometric problem.

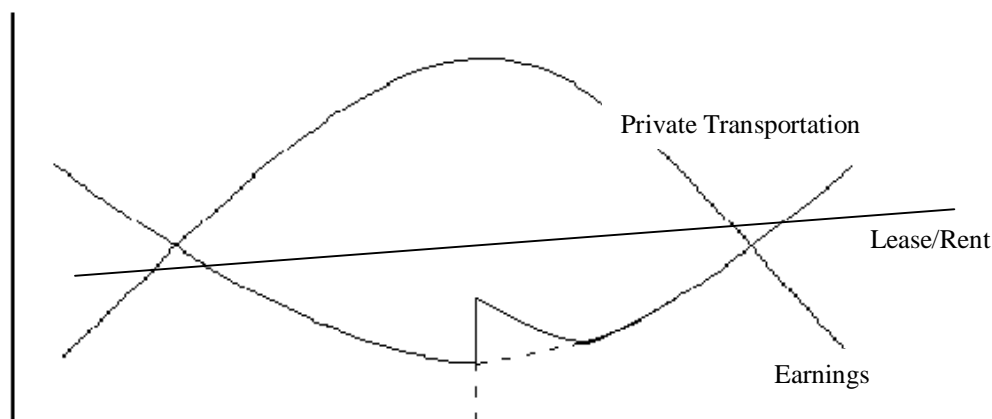
One central economic issue in the private transportation demand studies (or demand for any durable good for that matter), is the notion of zero expenditures at any given point in time given the lumpy nature of private transportation expenditure. Cragg and Uhler (1970) discuss this issue and present an explicit model of automobile demand that recognizes the durable nature of transportation goods.

By the nature of durable goods, if a consumer holds a durable such as an automobile in one period, he begins the next period with this asset. As a result, the decision on what to hold in one period affects the possibilities open in succeeding periods. The relevant utility function is therefore a multi-period one...the consuming unit may borrow and lend at market rates of interest without restriction and has a given stream of income (Cragg and Uhler, 1970).

The multi-period nature inherent in the demand for private transportation lends itself to a standard life-cycle consumption model. Figure 1 portrays vehicle expenditures as a convex step function over the household's lifetime.

¹ Calculated from household expenditures as reported in the 1984, 1986, 1990, and 1996 FAMEX surveys.

Figure 1. Household Life-Cycle for Private Expenditure



This functional representation implies that after the initial purchase OI in period t , the remaining yearly expenditures may decrease until replacement at M . This convex step function can be modified if the household leases in lieu of purchasing private transportation were the expenditures would be a slightly upward sloping line.

The literature cited earlier also reports a number of common variables related to the life-cycle hypothesis as depicted in Figure 1. These variables are age, household size, number of children, and household disposable income. Beyond this common set of variables, depending on the focus of the author, other variables are incorporated to assess their relevance to the particular demand function under consideration. For example, Wetzel and Hoffer (1982), incorporate in their consumer demand model for automobiles a common set of economic variables including prices of complements, the price of substitutes, own price and household income. In the “other factors” category, they incorporate market size, technology, and styling. Thus the life-cycle hypothesis provides the core variables with more exotic variables used to explain demand for transportation in a particular setting.

Rippe and Feldman (1976) present a model of vehicle demand based on residential construction and proximity to the city center. They argue that “suburban and rural homeowners are more likely to own cars than are central city residents” (Rippe and Feldman, 1976). The implication for transportation modeling in the context of immigrants and growing cities is clear. Rippe and Feldman conclude that residential construction has a positive impact on automobile sales and argue that construction is an omitted variable in most other models.²

I will indirectly recognize this construction phenomenon when I incorporate recent immigrant arrivals in my private transportation demand analysis.³ This study also explicitly recognizes the recent modeling which has argued that different tastes and preferences can be captured as demographic variables. Burton and Young (1992), suggest that “Our methodology. . . does not allow one to determine the underlying causes of taste changes in consumer preferences. But many factors could be suggested to explain changes in taste. These might include changes in household constraint. . . (and) in demography (age, sex, and ethnic composition of population).” In this spirit we include these demographic arguments to account for cultural differences.

Finally, I will incorporate the recent demand methodologies for housing (Laryea 1999; Lewin-Epstein and Semyonov 1999) and food expenditures (Werner 2000) when I argue that significant transportation expenditure differences arise due to foreign birth status, country of origin, and year of arrival.

A Comparison Across Birth Status Groups

The following series of figures depict expenditure patterns over the period 1984-1996. The data shows that the foreign born spend both absolutely and in terms of budget share, more on transportation than do Canadian-born households. A central motivation of this study is to

² Within the framework of a stock adjusted model, housing is included as one determinant of the desired stock of automobiles, and upon re-estimation its inclusion is found to improve substantially the empirical results. (Rippe and Feldman, 1976)

³ Considering that approximately 2/3 post-1991 urban growth and home construction has been due to immigration, this could be used as a proxy for assessing private transportation demand.

isolate what factors lead to the observed differences in expenditure patterns by birth status. Three general arguments could lead to these differences on transportation expenditure: cohort differences, a period effect, and rate of assimilation of immigrant tastes over time.

If I control for household expenditures and compute a household's budget weight or share of transportation expenditures, substantial differences appear by birth status and year as shown in Figure 2. In short, the foreign born household systematically allocates a greater budget share to total transportation expenditure than their Canadian born counterpart.⁴ Between 1984-1996, foreign-born households allocated between 0.5% and 2% more to transportation expenditure than their Canadian born counterpart.

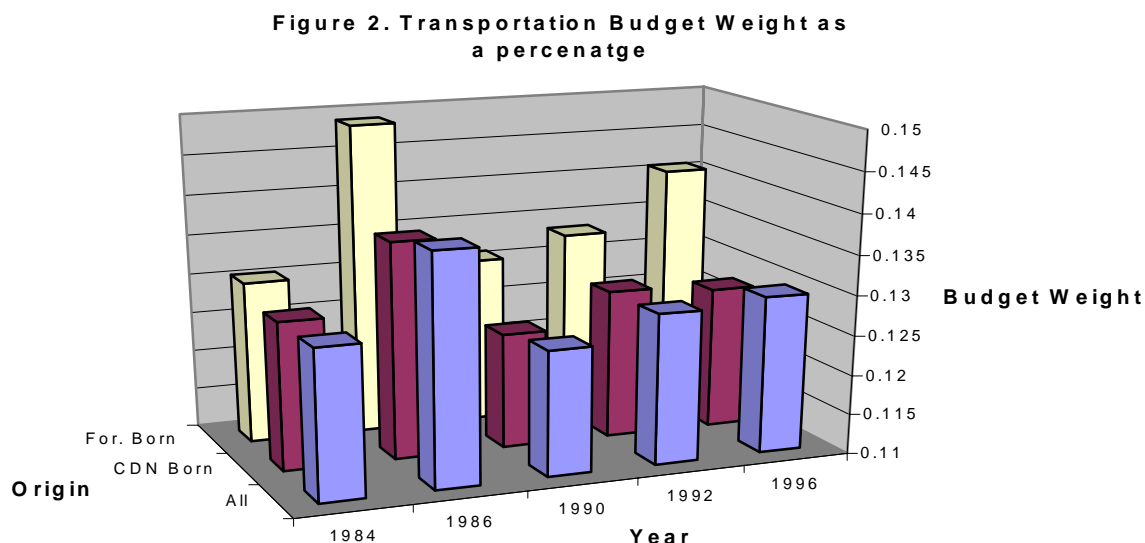


Figure 3, which reports private transportation expenditures, reveals only minor budget share differences by aggregate foreign-birth status. These differences in private transportation expenditures by birth status are very small, indicating that the bulk of the difference across households comes from differences in public transportation expenditures.

⁴ Note that Total Transportation as reported in the 1996 Survey of Family Expenditures, released May 14, 1998, is defined as the sum of private and public transportation. Private transportation expenditures include the purchase, lease, and operation of cars and trucks plus garage and insurance expenses. Public transportation expenditures include local and commuter transportation, inter-city transportation and Airplane.

Figure 3. Private Transportation Budget Weights

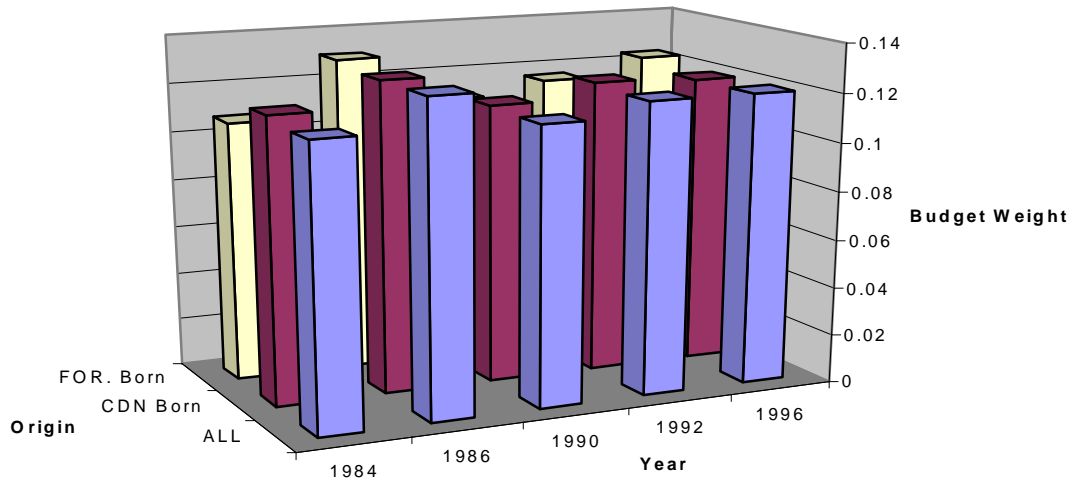
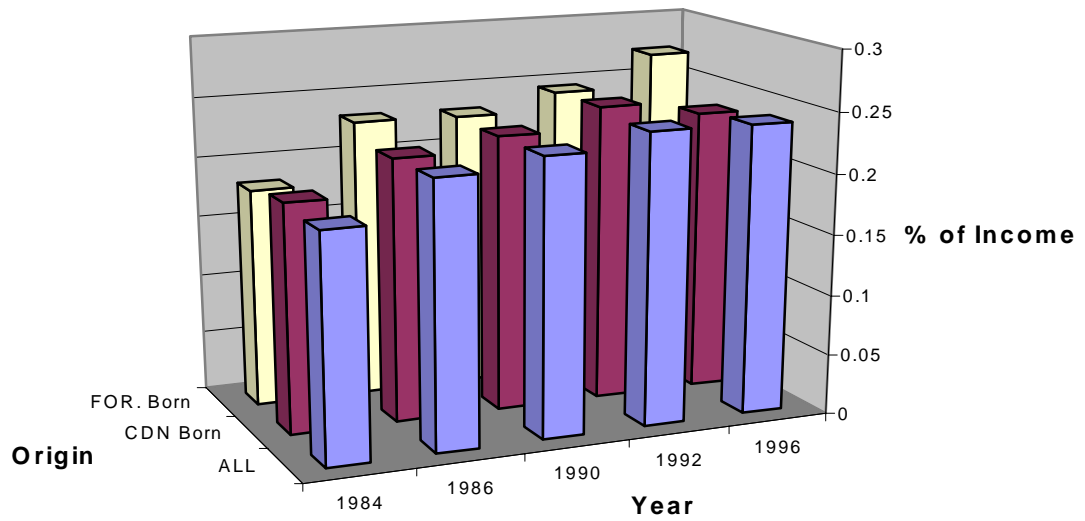


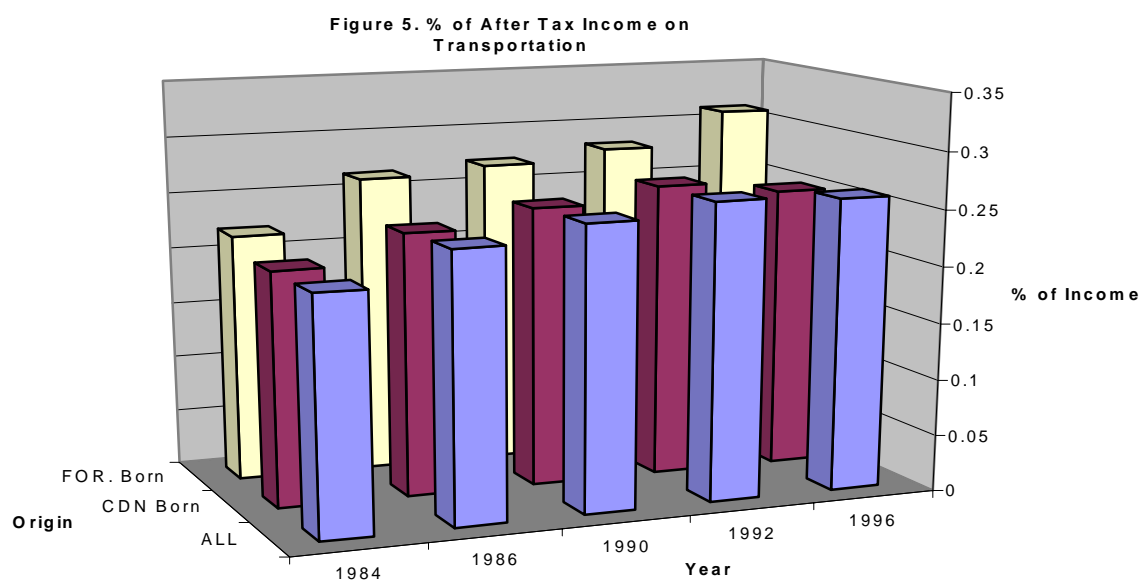
Figure 4. % of After Tax Income on Private Transportation



Data from the FAMEX

These different private transportation expenditure patterns widen slightly when I control for after-tax household budget shares.

In short, with the exception of 1984, the foreign born generally devote a greater portion of their after tax income to private transportation, even though the difference is not substantial. However, a greater relative difference emerges by foreign birth status when we consider the percentage of after tax income on total transportation expenditure (which captures the difference in public transportation). Consider Figure 5 below.



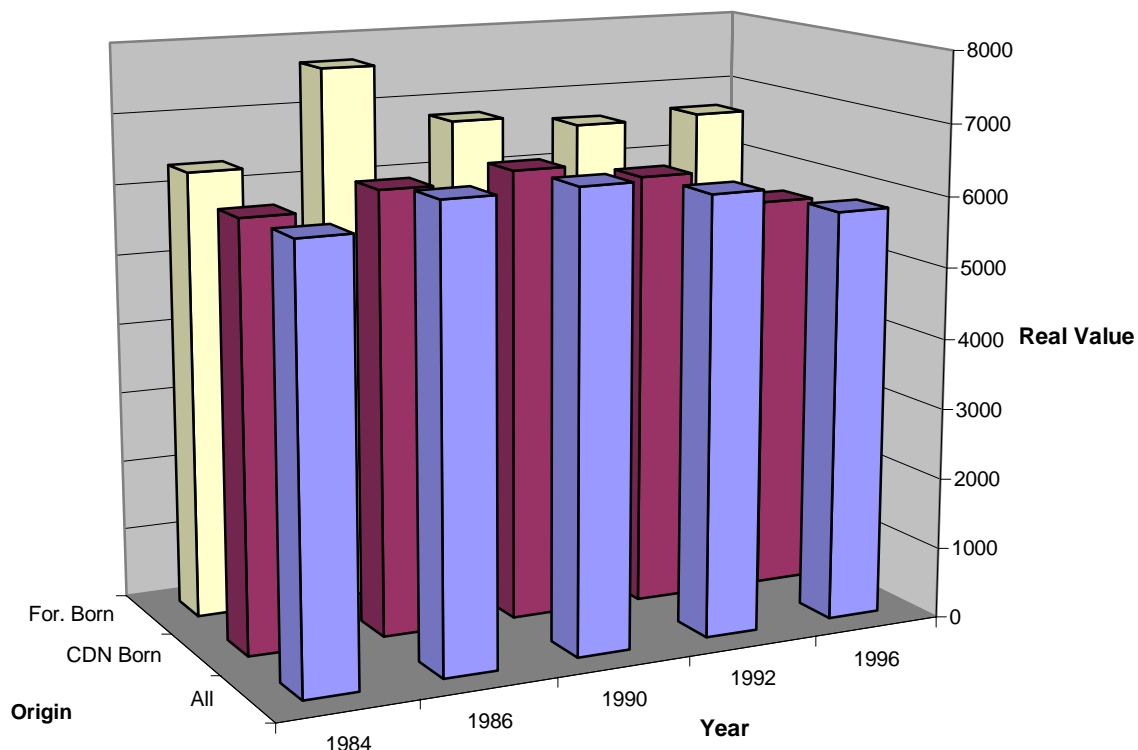
The diagram indicates that there is a greater proportion of after tax income devoted to public sector transportation by foreign born than there is by Canadian born in any sampled years. In particular, the foreign-born post-tax budget share rises from 0.22 in 1984, to over 0.30 by 1996. On the other hand, the Canadian-born post-tax share fluctuates slightly between 1984 and 1996. Thus by 1996, the foreign-born spend over 5% more of their post-tax budget share on total transportation.

Two competing explanations arise to rationalize these observed differences. First, differences in income levels between the Canadian and foreign-born grows coupled with differences in expenditure elasticities could have led to these differential expenditure patterns. Moreover, length of time in Canada can accentuate the observed differences in budget share. As years in Canada increases for the foreign-born, not only will income rise

but also tastes for public versus private transportation will change. The change in tastes toward greater transportation expenditure could in turn arise from immigrants' mobility from urban to suburban areas after arrival. On this note, Foot and Stoffman (1998) indicate the importance of growing suburban areas and the impact it will have on public transportation expenditures. Though their focus is on the aging baby boomer cohort and their settlement in the suburbs for retirement, the same principle does apply. "They (public transportation), were not invented to serve sparsely populated suburbs. Public transit makes money in the core; it loses money in the suburbs." (Foot & Stoffman 1998) Therefore, with immigrants opting to live in the suburbs, the demand for public transportation will increase, and if sufficient public transportation does not exist, expenditures in private transportation will inevitably rise.

Consider Figure 6 below. After having deflated the nominal values, using 1992 as our base year, we can make several interesting observations about cohort and assimilation effects on total transportation expenditure.

**Figure 6. Total Transportation Expenditure:
Real Value (1992 base year)**

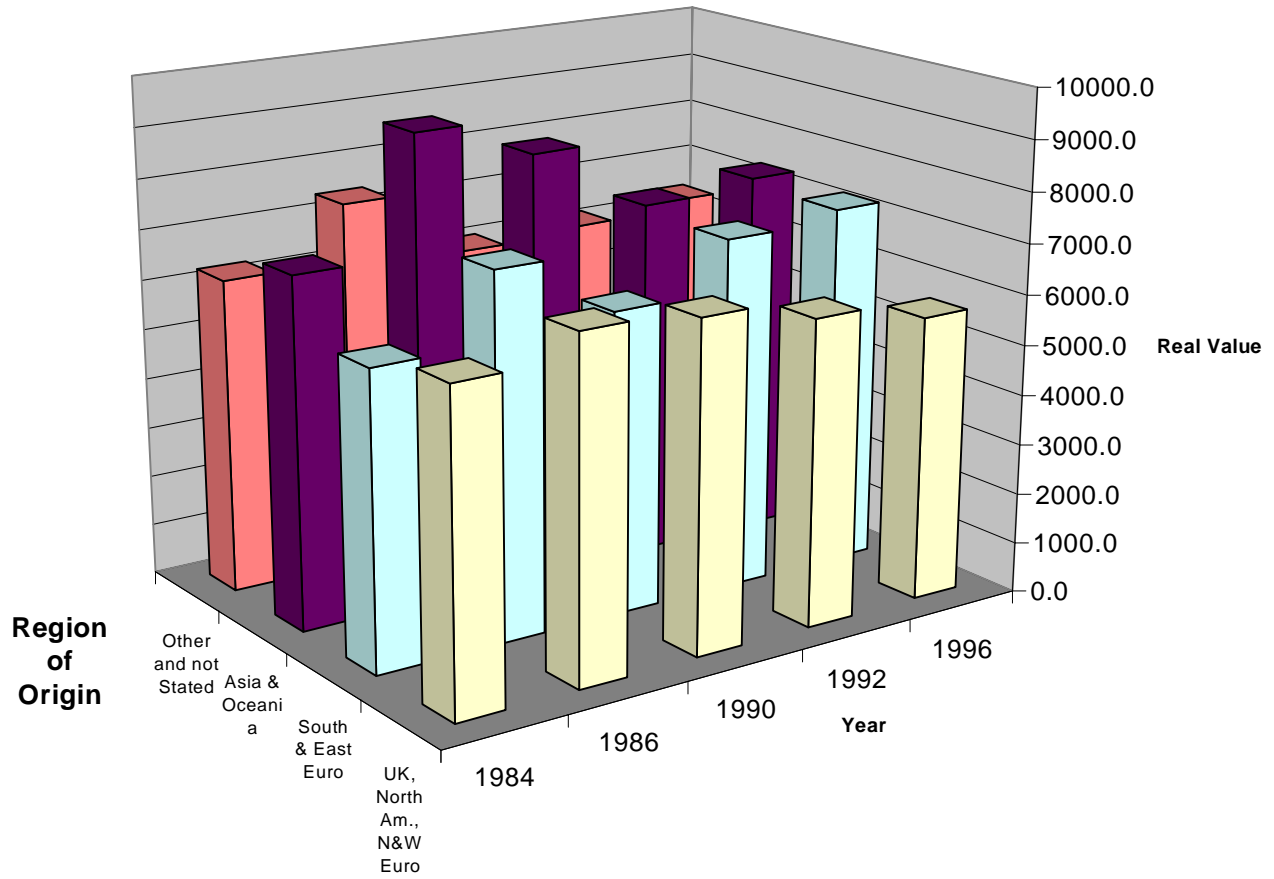


* Data obtained from the FAMEX data base

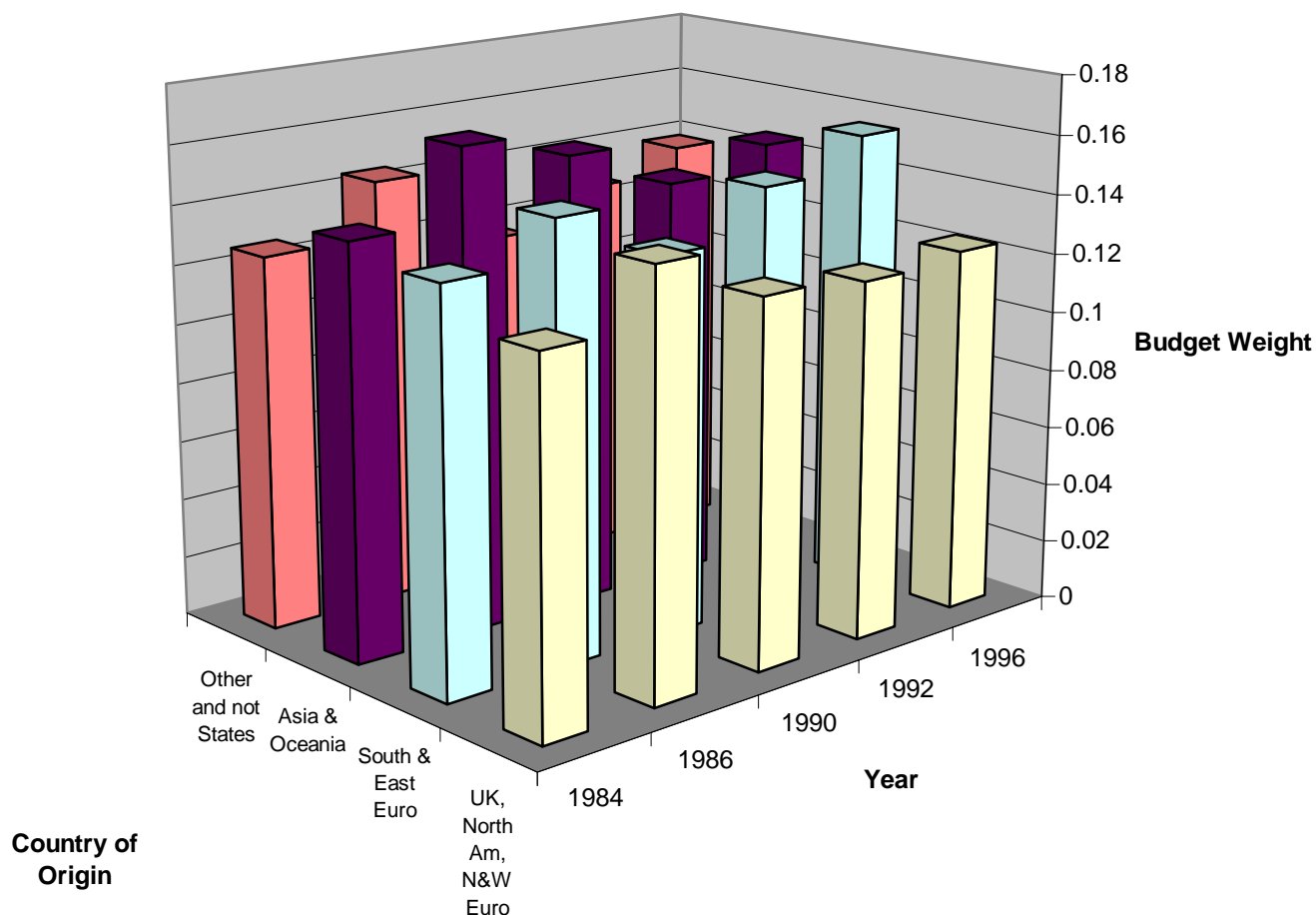
Recall that total transportation expenditure patterns of the foreign born differ from that of the Canadian born, and the differences persist cross-sectionally and over time. For the Canadian born transportation expenditures (1992 dollars), fluctuates over time. The foreign born on the other hand exhibit an initial rise but then they spend at a relatively constant level for the remaining study period. This expenditure variation across time and birthplace justifies suggests that our modeling and econometric estimates should be disaggregated by region of origin.

Figures 7 and 8 add further evidence to the need for disaggregation. The budget weights, as shares devoted to total transportation expenditures, control for household income and still reveal persistent expenditure differences across entry groups in any year.

Figure 7. Real Total Transportation Expenditures: 1984-1996
Real Value (1992 base year)



**Figure 8. Transportation Budget Weights
By Country of Origin: 1984-1996**



Date obtained from the FAMEX database.

In sum, the descriptive analysis and the life-cycle model in Figure 1 help define my estimation model. Figure 7, argues that the standard determinants of transportation demand (i.e. income, family size, age, and foreign birth status) must be included in my demand argument. Separating demand by country of birth and entry period will test for an assimilation process as well as taste difference.

In the following section we use regression analysis to estimate these differences by foreign birth status and use the results to simulate expenditures over time to assess the feasibility of the life-cycle consumption hypothesis.

Life Cycle Theory and Estimating Equations

Linear Household Expenditure System.

At this point with the aid of a life-cycle model we first estimate a transportation expenditure equation as part of a complete expenditure system and then concentrate on individual estimates of an independent transportation equation. The intent of this exercise is to highlight several issues. Firstly, to determine the total expenditure elasticity on the demand for transportation and private transportation by birth status, and then to compare them with the results once we incorporate such demographic controls as age and household size. Second issue to investigate would be to compare the results of this study with similar studies done on other expenditure items such as food expenditure (Werner 2000) and health care expenditure (Didukh 2000).

The Model

Both the available literature and Figure 1 argue for a linear expenditure function as follows:

$$\ln(EX_{t,p}) = c + x_1 \ln(RLTotex) + \varepsilon$$

Eq. 1

$$\ln(EX_{t,p}) = c + x_1 age + x_2 age^2 + x_3 HH + x_4 \ln(RLTotex) + x_n dummy_n + \varepsilon$$

Eq. 2

where EX refers to either private (p) household transportation expenditures or total (t) household transportation expenditure as specified for each regression, and the dummies are specified for the years 1986, 1990, and 1996.

The data used is from the 1984, 1986, 1990, 1996 Famex series. The data were screened such that the following conditions were met.

1. Male head of household.⁵
2. Total and private transportation expenditure of greater than \$0 dollars.

⁵ Note that male head of household was selected because male reference persons had both on average a greater income than female reference persons and also were a higher representation of the total sample in terms of greater income as shown in the appendix. Hence the selection for male head of household.

3. Age range of 25 to 65 years.
4. Foreign-born household is defined as any head of household not born in Canada.

According to these specifications and the none zero observations of logged variables, we have a total number of 14,251 observations. Of this number, there are 11,608 ‘Canadian-born’ observations and 2,643 ‘foreign-born’.

Table 1 contains the pertinent descriptive statistics of the data set used.

Table 1. Average values of variables in pooled data set (1984-1996)

	Age	Hh. Size	Real Tran Exp.	Real Priv. Tran exp	Real Total Exp
All	42.65	3.19	6888.4615	6348.1028	52701.688
Canadian-born	42.08	3.13	6745.9097	6316.6069	52293.739
Foreign-born	45.13	3.45	7475.0184	6486.4320	54493.392

I first estimate the expenditure function without any demographic controls, to derive expenditure elasticities for both total transportation expenditure and private transportation expenditure as reported in column 2 of tables 2 and 3. However, when we add the demographic controls (age, age², and household size) the results are slightly larger.

Table 2a. Total Transportation Expenditure, Comparison of Expenditure Elasticity With and Without Demographic Controls

Total Transportation Exp.	Expenditure elasticity w/o demographic controls	Expenditure elasticity with demographic controls
All	1.030	1.052
Canadian-born	1.015	1.042
Foreign-born	1.089	1.102

Table 2b. Total Private Transportation Expenditure, Comparison of Expenditure Elasticity With and Without Demographic Controls

Total Private Transportation Exp.	Expenditure elasticity w/o demographic controls	Expenditure elasticity with demographic controls
All	1.069	1.079
Canadian-born	1.050	1.059
Foreign-born	1.161	1.167

A comparison of the expenditure elasticities in tables 2 and 3 highlight several points. As would be expected the expenditure elasticity for private transportation is greater than the expenditure elasticity for total transportation expenditure. In other words, we observe $|\eta_P| > |\eta_T|$. This is intuitive in that one would expect a greater change in private expenditure allocation for a given change in total expenditures, something that is also highlighted in the system of equations for expenditures as calculated by Didukh (2000). Further, when we compare the elasticities of private and total transportation expenditure with and without the demographic controls, we notice the differences in the value. Several issues are well worth noting. Firstly, intuitively, we would expect some degree of multicollinearity between age and expenditure elasticity. However, this is not the case in that transportation expenditure is negative in age and hence the convex curve when simulating the life-cycle expenditure pattern. A second important issue is to rationalize the direction of change in the magnitude of the expenditure elasticities once we add the demographic control variables. In all cases, expenditure elasticities with demographic controls are larger (though marginally) than elasticity estimates derived without controls. Therefore, the age variable and the household size variable do have an impact on expenditure elasticities. The curious point that remains is whether or not the impact of the control variables should have been greater on the expenditure elasticities. I will come back to this later.

System of equations:

Didukh (2000), in her analysis of household expenditures, presents a system of equations incorporating a series of expenditure items including transportation expenditures (i.e. car/truck purchase & car/truck operation). In her study, using AIDS regressions, she finds that car/truck purchases are in fact elastic in expenditures and own prices. Tables 18 and 19 in Didukh (2000), summarize these findings along with elasticities for a number of different expenditure items. The AIDS demand function used is of the following form:

$$w_i = \alpha_i + \sum \gamma_{ij} \log P_j + \beta_i \log(x/P)$$

where

$$\log P = \alpha_0 + \sum \alpha_k \log P_k + (1/2) \sum \sum \gamma_{kj} \log P_k \log P_j$$

and where, w_i is the budget share of the i^{th} good, P_j is the price of the j^{th} good, and x is total expenditure.

The double-log regressions with and without demographic controls show us the expenditure elasticity by foreign birth status. From the results it is obvious that even though the elasticities are not significantly different, they are also another indication that foreign-borns do have different expenditure patterns. These differences are further highlighted with the set of simulations that are performed and the resulting graphs. Here a set of standard OLS regressions have been run, to gather results used for the simulations. The regressions are of the form:

$$EXP_{T,p} = c + x_1 age + x_2 age^2 + x_3 Hh.Size + x_4 RLTotEx + x_n dummy + \varepsilon$$

Eq. 3

where EXP represents expenditure on Total and Private transportation as specified, and TotEx represents total household expenditure.

Table 3a. Parameter Estimates for Real Total Transportation Expenditure On Selected Variables, (ALL Canadians)

Coefficients	Unstandardized		Standardized		t	Sig.
	Coefficients	Std. Error	Coefficients			
	B	Std. Error	Beta			
(Constant)	4147.417	773.713		5.360	.000	
RLTOTEX	0.121	0.002	.536	74.315	.000	
AGE	-249.085	37.905	-.402	-6.571	.000	
AGE_2	3.091	0.425	.445	7.270	.000	
TOTAL PERSONS A MEMBER						
SOMETIME IN 1996	160.461	36.110	0.033	4.444	.000	
DUMMY96	309.231	141.501	.020	2.185	.029	
DUMMY90	89.611	168.511	.004	.532	.595	
DUMMY86	603.171	134.679	.042	4.479	.000	

a Dependent Variable: Real Transportation Expenditure

Table 3b. Parameter Estimates of Real Total Transportation Expenditure On Selected Variables (Canadian Born)

Coefficients	Unstandardized		Standardized		t	Sig.
	Coefficients	Std. Error	Coefficients			
	B	Std. Error	Beta			
(Constant)	4313.622	829.733		5.199	.000	
RLTOTEX	.114	.002	.526	65.289	.000	
AGE	-248.602	40.954	-.412	-6.070	.000	
AGE_2	3.120	.462	.460	6.757	.000	
TOTAL PERSONS A MEMBER						
SOMETIME IN 1996	182.256	40.104	.038	4.545	.000	
DUMMY96	244.002	156.004	.017	1.564	.118	
DUMMY90	113.578	186.487	.006	.609	.543	
DUMMY86	532.484	147.804	.039	3.603	.000	
DUMMY86	532.484	147.804	.039	3.603	.000	

a Dependent Variable: Real Transportation Expenditure

Table 3c. Parameter Estimates of Real Total Transportation Expenditure On Selected Variables (Foreign Born)

Coefficients	Unstandardized		Standardized		t	Sig.
	Coefficients	Std. Error	Coefficients			
	B	Std. Error	Beta			
	B	Std. Error	Beta			
(Constant)	4715.444	2095.994		2.250	.025	
(Constant)	4715.444	2095.994		2.250	.025	
RLTOTEX	.153	.004	.586	36.205	.000	
RLTOTEX	.153	.004	.586	36.205	.000	
AGE	-297.605	99.096	-.422	-3.003	.003	
AGE	-297.605	99.096	-.422	-3.003	.003	
AGE_2	3.351	1.085	.435	3.088	.002	

TOTAL PERSONS A MEMBER	13.433	83.815	.003	.160	.873
SOMETIME IN 1996					
DUMMY96	592.441	331.954	.035	1.785	.074
DUMMY90	69.191	388.232	.003	.178	.859
DUMMY86	914.932	325.895	.055	2.807	.005

a Dependent Variable: Real Transportation Expenditure

The results by foreign birth status differ in terms of the magnitude and the significance of the parameter estimate. For example, whereas household size is a significant variable when running the regression for the Canadian born, it becomes an insignificant variable when the same is run for foreign born. Also, RLTotex differs when we disaggregate by birth status, reflecting a greater impact on foreign born than Canadian born. As for the dummy variables, the 1986 dummy is significant, whereas the 1990 and 1996 dummies are not.

Tables 7 to 9 report regression results, with real private transportation expenditure functions regressed on the same set of independent variables. Doing this, the focus shifts from overall transportation expenditure, which include public transportation (regarded as a necessity), to gauging taste differentials in private transportation which may reflect greater choice.

Table 4a. Parameter Estimates for Real Private Transportation Expenditure On Selected Variables (ALL Canadians)

Coefficients	Unstandardized	Std. Error	Standardized	t	Sig.
	Coefficients		Coefficients		
	B		Beta		
(Constant)	3996.093	780.569		5.119	.000
AGE	-243.448	38.241	-.401	-6.366	.000
AGE_2	2.972	.429	.437	6.930	.000
RLTOTEX	.109	.002	.493	66.334	.000
TOTAL PERSONS A MEMBER	185.175	36.430	.039	5.083	.000
SOMETIME IN 1996					
DUMMY96	499.224	142.755	.034	3.497	.000
DUMMY90	173.002	170.004	.009	1.018	.309
DUMMY86	768.845	135.872	.055	5.659	.000
DUMMY86	768.845	135.872	.055	5.659	.000

a Dependent Variable: Real Private Transportation Expenditure

Table 4b. Parameter Estimates for Real Private Transportation Expenditure On Selected Variables (Canadian Born)

Coefficients	Unstandardized	Std. Error	Standardized	t	Sig.
	Coefficients		Coefficients		
	B		Beta		
	B		Beta		
(Constant)	4054.092	839.406		4.830	.000

(Constant)	4054.092	839.406		4.830	.000
AGE	-240.973	41.431	-.405	-5.816	.000
AGE_2	3.002	.467	.449	6.428	.000
RLTOTEX	.103	.002	.483	58.321	.000
TOTAL PERSONS A MEMBER	242.039	40.572	.051	5.966	.000
SOMETIME IN 1996					
DUMMY96	374.710	157.823	.026	2.374	.018
DUMMY90	205.543	188.661	.011	1.089	.276
DUMMY86	632.922	149.527	.047	4.233	.000

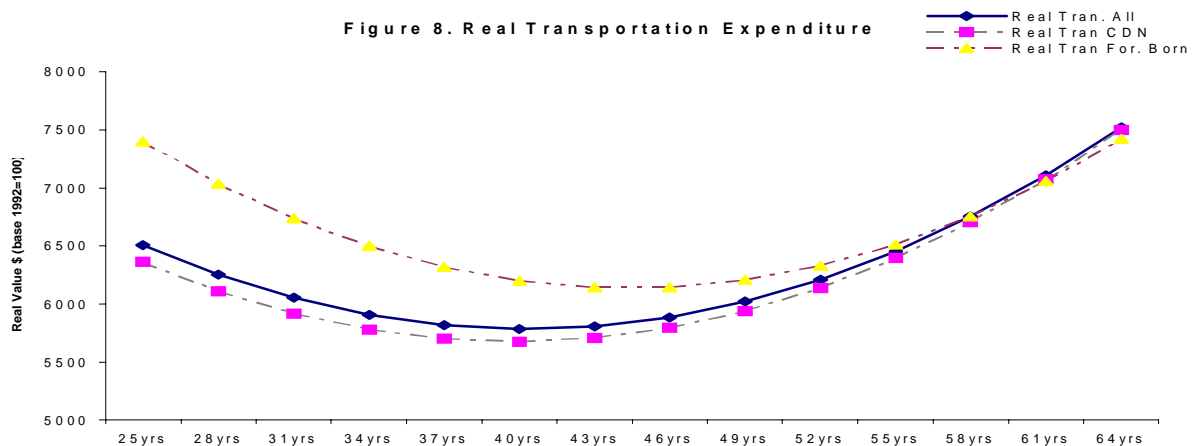
a Dependent Variable: Real Private Transportation Expenditure

Table 4c. Parameter Estimates for Real Private Transportation Expenditure On Selected Variables (Foreign Born)

Coefficients	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std. Error			
(Constant)	4439.998	2102.991		2.111	.035
AGE	-288.045	99.427	-.423	-2.897	.004
AGE_2	3.215	1.089	.433	2.953	.003
RLTOTEX	.135	.004	.538	31.946	.000
TOTAL PERSONS A MEMBER	-18.085	84.095	-.004	-.215	.830
SOMETIME IN 1996					
DUMMY96	917.913	333.062	.056	2.756	.006
DUMMY90	85.439	389.528	.004	.219	.826
DUMMY86	1159.028	326.983	.073	3.545	.000

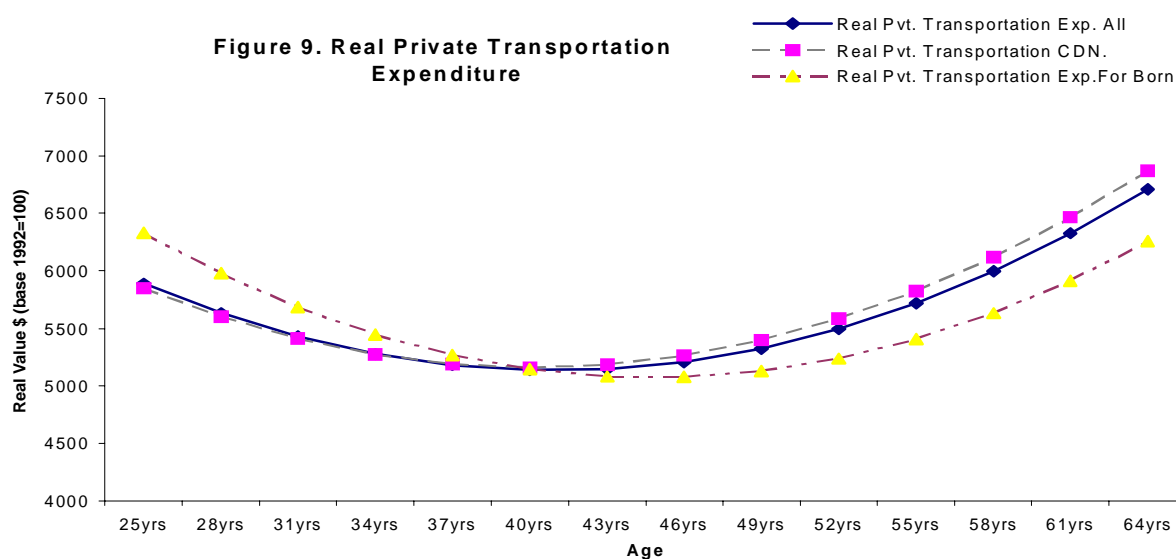
a Dependent Variable: Real Private Transportation Expenditure

The total private transportation estimates replicate the results for total transportation (Tables 3 a, b, and c), again household size was an insignificant variable in determining real transportation expenditure by Foreign born. This would raise some questions again that both theory and intuition would lead us to believe that the bigger the size of the household (dependents being over the age of 16) there should be a greater level of expenditure on transportation. We do not observe this with the foreign born. Tables 3a-c and 4a-c allow us to simulate lifetime patterns on total transportation and private transportation expenditures. Life cycle theory predicts that transportation expenditures over age would be convex and my results (Figure 8) confirm this hypothesis.



More importantly however, is the further distinctions we can draw between the two groups of foreign-born and Canadian-born. The important observation from this graph is that foreign-born has a significantly higher level of expenditure on transportation in the 25 to 49 year age group, and assimilate to Canadian-born cohort after age 46.

However, when we do the same for real private transportation expenditure, the results become more complex. As Figure 9 indicates, whereas the representative foreign-born households initially have a greater private transportation expenditure level between the ages 25 to 40, the difference collapses by age 43. After age 43, the Canadian-born representative household has a greater level of absolute private transportation expenditure with a progressively widening gap.



Figures 8 and 9 raise two points about expenditure assimilation. In particular, I seek an explanation for why there is a reversal in the household's expenditure pattern between the Canadian and foreign born for private transportation. In fact, for both total and private expenditures categories, a similarity exists in that initially the foreign-born households have a greater expenditure level on both private and total transportation. This initial higher expenditure by the foreign-born on private transportation is due to an initial need to purchase this durable good upon arrival. After age 43, time in Canada leads to a slower increase in real private expenditures for foreign-born households due to tastes and other unobservable variables.

The remaining three graphs illustrate the difference between total and private real expenditure for all, Canadian-born, and foreign born respectively. These graphs merely illustrate the gap of expenditure on private and public transportation between groups, but an absolute measure of the desire for public and private transportation as indicated by the expenditure levels. Figures 11 and 12 present a fairly uniform difference at every expenditure level. However this difference for the foreign-born is greater, indicating greater expenditures on public transportation at every age category.

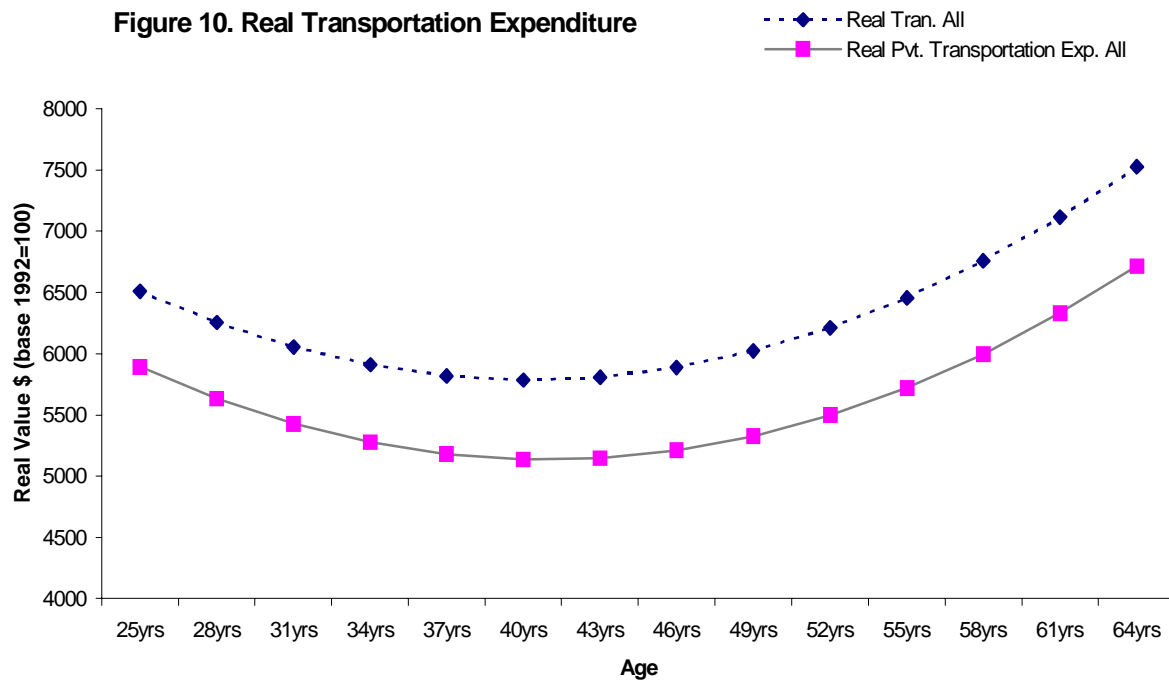


Figure 11. Real Transportation Expenditure for foreign-born

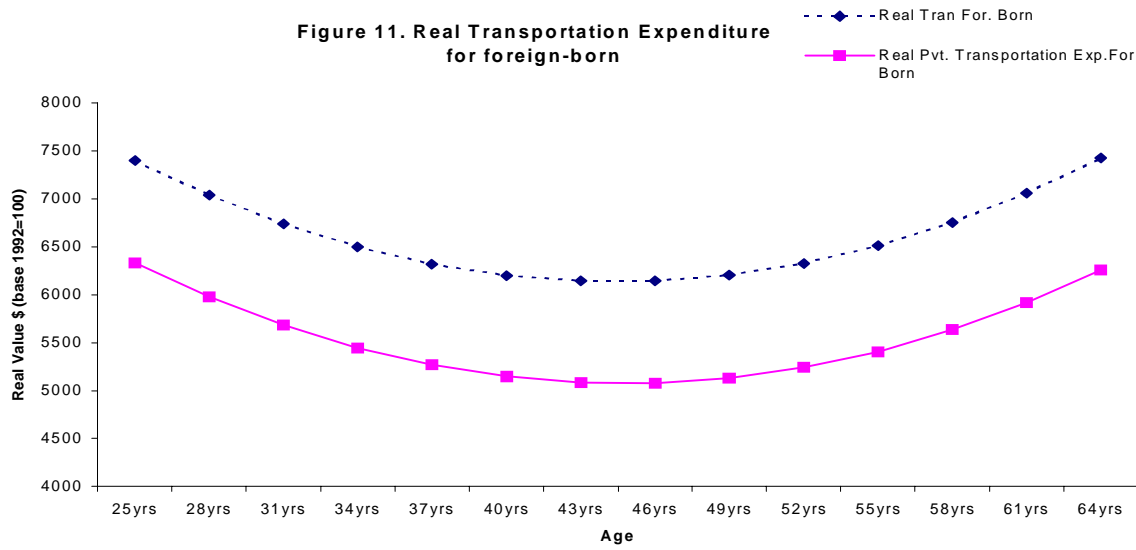
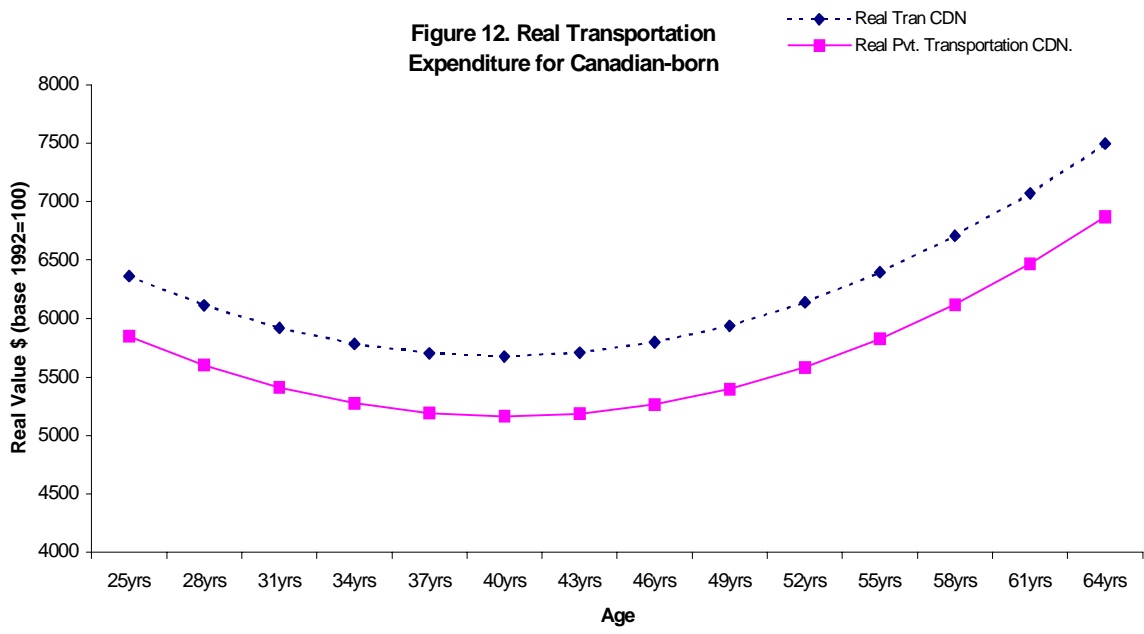
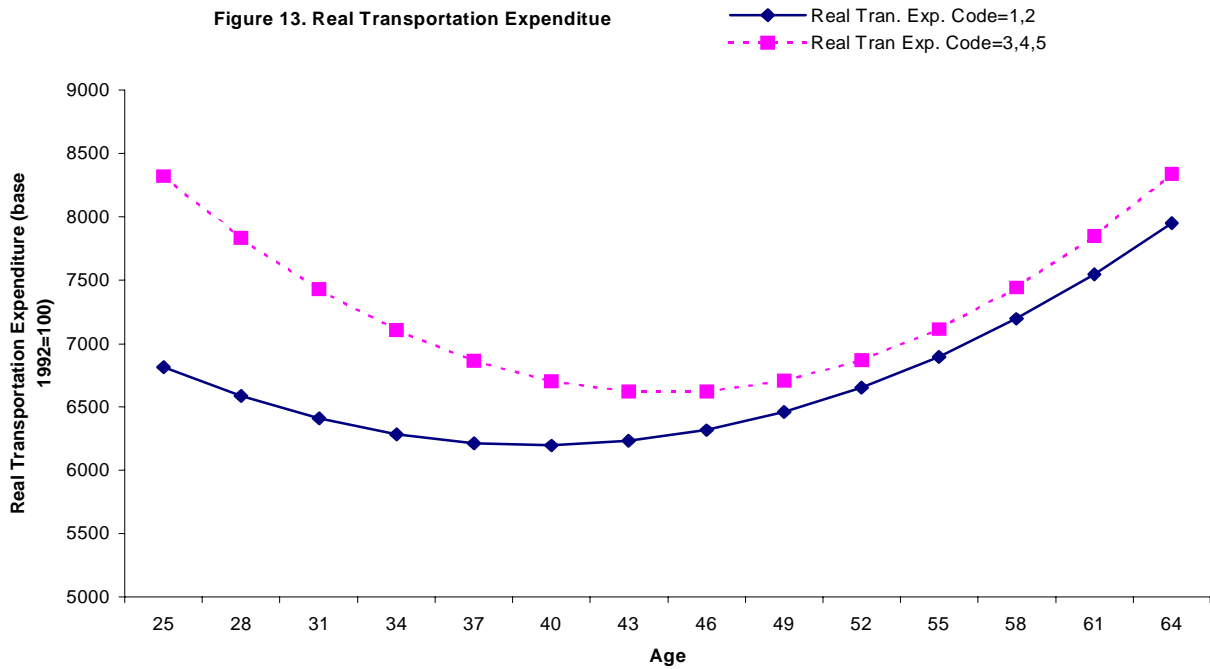
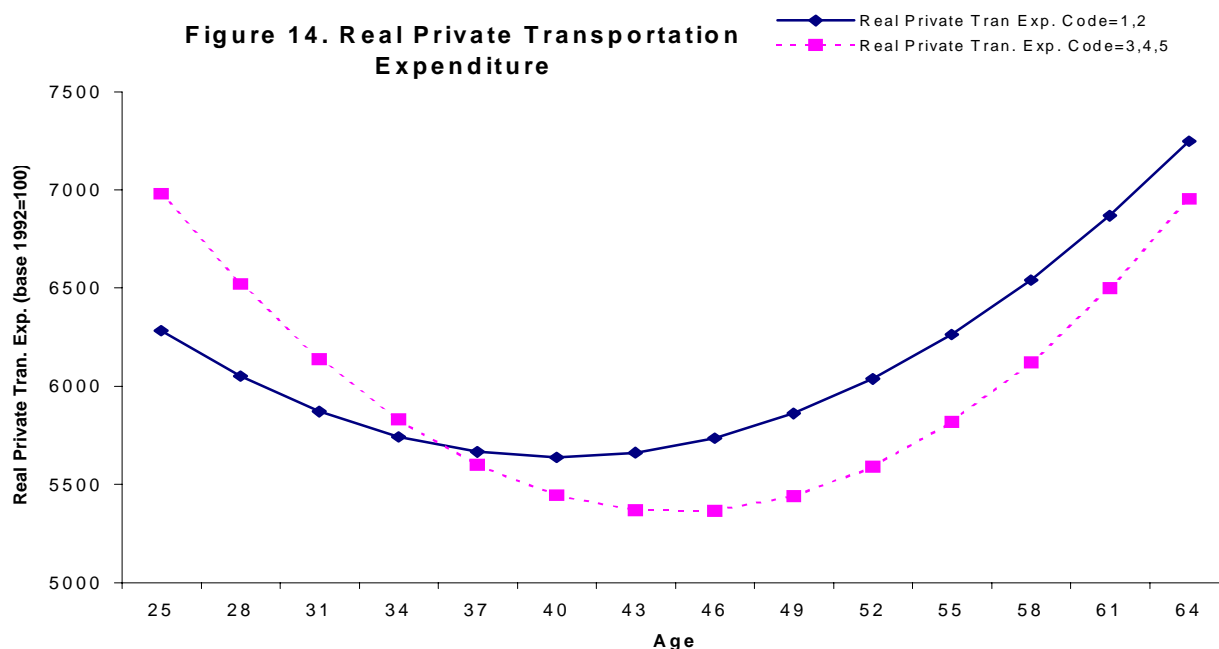


Figure 12. Real Transportation Expenditure for Canadian-born





In one last analysis, I will narrow things a little more by suggesting that Canadian-born and Western European and North American be grouped together and compared with the remainder of the foreign-born, the logic here being that Western Europe and the United States may not be as different in tastes and preferences from the Canadian-born as would be individuals from Asia for example. So, by assuming this cultural closeness and thus same tastes and preferences, I have narrowed the study to assess the differences between this new and larger group (still referred to as Canadian-born) with the rest of the foreign-born together. The same trend is visible as when we compared foreign-born with Canadian-born, and as expected foreign-Born has a much higher level of expenditure early on, but the gap narrows after the midpoint. Consider the diagrams below.



The same trend is visible as when we compared foreign-born with Canadian-born, and as expected foreign-born has a much higher level of expenditure early on, but the gap narrows after the midpoint.

More important than total real expenditure however, is the trend we observe when we do the same sort of analysis for private transportation expenditure. With private transportation expenditure, foreign-born again do have a greater level of expenditure early on. However, this trend reverses itself quickly such that Canadian-born (which now includes North American and Western European) has a greater level of expenditure past age 37 years.

The empirical results point to large discrepancies between foreign-born and Canadian-born. It is important to analyze and understand these differences and to determine what are the underlying factors that cause this. Would it make sense to suggest that private transportation, in other words owning and operating a vehicle, is an extremely important investment for a newly arrived immigrant? If so, the implications would be rather important for government policy makers, those in the auto industry, and city planners. Cities such as Vancouver, Toronto, and Montreal that have traditionally been selected cities for immigration, are indeed feeling the impact of population growth, urban expansion and consequently the increase in vehicle demand. In British Columbia, traffic has certainly

become noticeable as commuters find themselves leaving home earlier, and leaving work later in a bid to avoid rush hour.

Therefore, be it for tax revenue implications, for traffic and transportation services planning, or energy and fuel consumption forecasting, the analysis must take into account the fact that in a heterogeneous society, different tastes and preferences will also be a factor in determining consumption patterns. This will of course be in addition to the already well-established economic theories and variables used to determining transportation demand.

Conclusion

Given the results when we compare foreign-born and Canadian-born, and considering the differences that are observed in both the values as well as the significance of the variables, it becomes rather important to take account of this matter, particularly for policy purposes. Canada's immigration policy allows for a quota of approximately 250,000 per year (though estimates suggest a lower number arriving in Canada). If it is true that assimilation into mainstream takes anywhere from 5 to 7 years, this means a significant number of potential consumers will affect the market for transportation services and automobiles differently from what the standard generic models would tell.

These are issues which would have to be assessed and studied carefully in developing a blue print for policy purposes and for understanding further tastes and preferences and the concept of integration into mainstream society. Certainly economic models of transportation demand which incorporate such variables as gasoline prices, interest rates, cost of repairs and so on, as well as hedonic models, which consider 'clean air' to be another determining variable, do allow for forecasting demand. However, these models, despite the intricate and clever design to capture the economic factors that may influence choice, fail to recognize, or at least do not allow for different tastes and preferences based on cultural differences (i.e. the impact of a heterogeneous society).

Therefore, making the distinction that in a heterogeneous society tastes and preferences perhaps based on culture or any other reason do make a difference in consumption will help in devising more pertinent policy decisions. As demonstrated here,

and in other studies on immigrant expenditure patterns, it would be important to consider the composition of migrants to Canada according to region of origin, and incorporate this notion that differences do exist, which in turn affect the economy differently, when devising policy actions.

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