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CURRENT WEALTH AND TENURE CHOICE

BY

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CURRENT WEALTH AND TENURE CHOICE

I. Introduction

Empirical studies of housing demand usually treat that demand as a housing service flow determined via a multiperiod optimization of household consumption. The quantity of housing services demanded by a household is perceived as depending principally upon the relative price of housing services, the household's permanent income and life cycle and other household attributes influencing the utility derived from housing service consumption. In keeping with the conventional separation of consumption and investment decisions there is no role for housing as an asset acquired as part of a strategy for meeting life cycle goals. Consequently, initial budget components such as current (transitory) income or current wealth are viewed as having little, if any, role in the determination of housing demand.

Most approaches to the determination of tenure choice derive from this consumption orientation to housing demand. Consequently, permanent income (lifetime wealth) is postulated to be the appropriate budget constraint for the tenure decision. Given that household portfolio objectives are thereby ignored, initial balance sheet variables and current income are presumed to have marginal, if any, impacts upon tenure election. In this paper we lay out the case for believing that current nonhuman wealth is not only important to the tenure decision, but may be expected to dominate permanent income derived (largely) from human capital. In doing so, we refocus the tenure choice question, develop a model in which current household nonhuman wealth (net worth)

plays a pivotal role in determining the quantity of housing demanded and the tenure mode utilized, and test the ensuing proposition with cross section household survey data rich in balance sheet as well as income information.

In Section II we illustrate the strong preference for ownership that exists even among young households in an environment where neither interest nor property taxes are deductible for income tax purposes. This leads to the conclusion that the appropriate tenure question deals (as suggested by Artle and Varaiya (1978) and Plaut (1987)) with the timing of first-time ownership. The remainder of the section develops the reasons for believing that current nonhuman wealth should be a primary determinant of the initial tenure switching decision and reviews the deficiencies in previous attempts to estimate the impact of current wealth on tenure choice. The model of simultaneous housing consumption and investment decisions presented in Section III focuses upon the role of current net worth. Section IV deals with empirical specification, the data set and measurement issues, and the regression results are presented in Section V. A brief summary of conclusions and implications is provided in Section VI.

II. The Role of Current Nonhuman Wealth in the Tenure Decision

1. The Context

Homeownership appears to have had very strong attractions for Canadian as well as U.S. households. Despite the nondeductibility of home mortgage interest and property taxes on owner-occupied homes in the calculation of taxable income, the overall incidence of homeownerhip in

Canada (62.1% in the 1981 Census) has been almost as high as in the U.S. Even among young households, those with substantial budget endowments are nearly universally owners; based upon urban households headed by a married couple with an employed head in the 18 to 34 age range, 93 percent of such households with total earnings in 1983 in excess of $35,000 and net worth in 1984 in excess of $50,000 were homeowners in 1984.[1]

This strong preference for ownership among the young suggests that budget constraints rather than life cycle attributes may be the primary reason well-established young households have the lowest incidences of home ownership shown in Table 1. The leveling off of ownership incidence for married family units at a high plateau during the middle-aged years is at least consistent with Michelson's (1977) finding that once electing ownership, households that remain intact have a very high incidence of continuing to be owners for most of their remaining life cycles. Assuming this is the case, the proper focus of tenure analysis is the timing of the first election of ownership.

However, most empirical analyses of tenure choice have utilized samples containing a wide range of ages of household heads in order to incorporate the consumption/savings assumptions of the conventional life cycle hypothesis into the estimated model.[2] These studies have focused upon the estimation of income and price elasticities. Generally, the appropriate income concept is deemed to be permanent income, usually explicitly or implicitly understood to represent an annuity derived from the present value of expected lifetime income; this is the flow equivalent to expected lifetime wealth, which consists of the discounted value

TABLE 1

Ownership Incidence by Age of Head

For Urban, Married Family Units With Employed Heads

(percent owning)

Age Cohort	1977	1984
18-24	19.8%	20.1%
25-29	49.3	43.3
30-34	67.9	68.5
35-39	80.2	72.6
40-44	83.8	82.0
45-49	82.0	84.0
50-54	81.4	84.0
55-59	78.2	85.9
60-64	72.0	83.6
Sample Size	3198	3579

Note: Family Units represent those in the Survey of Consumer Finances (SCF) samples who are located in urban centers of 100,000 or more as of each survey.

Source: Calculated from the SCF micro data tapes for each survey provided by Statistics Canada.

of future earnings from human capital plus the present value of expected investment returns generated from planned saving. The major focus of the literature has been upon construction of permanent income and lifetime wealth measures[3] and in determining the bias in income elasticities resulting from omission or misspecification of prices or from aggregation.[4]

Recent studies of the aggregate consumption function, however, have found a significant influence of current income incompatible with the permanent income (lifetime wealth) hypotheses.[5] In the next section we review micro market literature which concludes that current income matters in the determination of both the quantity of housing services demanded and tenure choice. We contend that the most plausible rationalizations of these findings create a presumption that current wealth (net worth) should play a critical role in determining the timing of the initial switch from renting to owning.

2. The Case for Current Nonhuman Wealth

The specific justification of permanent income as the appropriate household budget constraint in the context of tenure choice is based upon a view of the tenure decision as part of a life cycle housing service consumption optimization associated with peculiar long-term risks attending homeownership. There are, however, serious conceptual, as well as well-known measurement problems (Gillingham and Hagemann (1983), and Dynarski and Sheffrin (1985)) associated with the use of permanent income in the tenure context. In a perfectly competitive world with complete markets, perfect knowledge, divisible assets, zero

transactions costs and neutral taxes, households would be indifferent with respect to their mode of housing tenure. (Arnott (1985), Fallis (1983)). Thus, theories of tenure choice must be rooted in specific uncertainties or imperfections that are of sufficient importance to households to create tenure preferences. Households may be uncertain regarding future housing prices, rents, or interest rates; market imperfections of relevance may include high transactions costs and indivisible housing assets, incomplete rental (or ownership) markets, nonneutral taxes, rental externalities and capital market imperfections. Some combinations of these factors are likely to be inconsistent with the use of permanent income (lifetime wealth) as the budget constraint. For example, housing unit indivisibility, high transactions costs and downpayment requirements represent a factor combination that creates doubts regarding the viability of a critical assumption underlying the permanent income hypothesis, namely, the perfect substitutability of human and nonhuman capital.

Housing unit lumpiness is particularly important in the context of urban land use and building code regulations which require substantial minimal housing units and contribute to high land prices. The consequence of the high ownership threshold hurdles produced by such constraints, is that for young households tenure selection is a choice between two radically different household balance sheets. Ownership amounts to opting for a highly levered undiversified portfolio heavily weighted by a risky investment in owner-occupied housing; renting is consistent with holding a low risk financial asset portfolio with low leverage. In this situation the ownership election should be expected

to depend upon the relation of asset prices for minimal ownership units to current household net worth, contingent upon portfolio objectives.

The net worth constraint may be alleviated by leverage i.e., human capital collateral may be a close substitute for current net worth for households willing to accept leverage risks. This has been the assumption underlying most tenure choice and housing demand analysis; for example, Kain and Quigley (1975, Ch. 5) contend that the development of mortgage insurance made high ratio loans readily available and rendered current accumulated wealth irrelevant to the tenure decision. High ratio loans are, however, contingent upon households meeting income coverage constraints which are likely significantly tilted toward current income; in the housing tenure context it is these requirements that most likely represent the capital market imperfections Tobin (1967) had in mind as inhibitors to households' ability to liquify human capital. Moreover, risk averse households view financial asset accumulation as a hedge against the risks of levered ownership of a risky housing asset and may internalize downpayment requirements which substantially exceed those imposed by the capital markets (Plaut, 1987). In these situations, current net worth and current income should constitute significant components of the budget constraint vector.

The fungibility of lifetime wealth may also be impaired by the existence of high transactions costs in the housing market. High transactions costs both contribute to and reflect the illiquidity of housing assets. Pissardes (1978) contends that consumption of goods with high transactions costs is much more a function of current than permanent income oriented life cycle models imply. Again current net

worth is a substitute for current income in this situation.

Downpayment requirements as entry fees to initial homeownership election stem from both transactions costs and income coverage requirements. The dependence upon current income or net worth is reinforced by lender (insurer) insistence that downpayment requirements be met from current household resources, not from borrowing. The moral hazard concerns which serve as the root cause of such requirements provide the rationalization for Dynarski and Sheffrin's (1985) and Goodman and Kawaii's (1982) contentions that transitory income has an impact, independent of permanent income, upon tenure election and the quantity of housing demanded, respectively. Transitory income proves to be empirically significant in both cases. Henderson and Ioannides (1985) find confirmation of their (1983) model which hypothesizes that current income, represented by the tilt in the time path of income, has a significant impact on tenure choice, given lifetime wealth. Direct evidence of the impact of the downpayment constraint exists in Dhrymes (1983) who, utilizing the U.S. Annual Housing Survey database, estimates that the probability of first-time ownership has about a unitary elasticity with respect to the proportion of house values lenders require as downpayments.

Theoretical modelling of the tenure issue by Artle and Varaiya (1978), Slemrod (1982) and Brueckner (1985) has clarified the constraining role of downpayment requirements by integrating principles of life cycle savings with the imperfections and uncertainties underlying tenure preferences. These models assume tax nonneutralities permit housing services to be acquired at lower cost over the life cycle via

the ownership option. However, achievement of ownership requires asset accumulation to meet downpayment requirements; this capital accumulation is accomplished in these models by households distorting consumption below optimal levels produced from solving a multiperiod consumption algorithm with a permanent income constraint. Downpayment requirements do significantly impact tenure choice in Slemrod's (1982) simulation analysis based upon his general equilibrium growth model.

Such models imply that observed household net worth has been generated by a savings/investment dynamic conditional upon (i) a strong desire for ownership and (ii) a significant downpayment barrier. Tenure choice and net worth can be conceived as being jointly determined from a set of simultaneous equations specifying life cycle savings/investment decisions; ownership is only observed when the savings/investment results have generated the threshold net worth. A substitute for this onerous and endogenous wealth accumulation process is available to some young households from exogeneous receipts of wealth via gifts and bequests. The extensive literature which demonstrates, at the macro level at least, substantial net saving among retired households (Mirer (1980), Davies (1981), Bernheim (1984)) suggests that such transfers may occur in very substantial magnitudes. Indeed, Kotlikoff and Summers (1981) conclude that aggregate wealth accumulation in the U.S. has been primarily driven by intergenerational transfers, not by the savings pattern hypothesized by life cycle theory. Such exogenous transfers strongly separate current net worth from constructed lifetime wealth and highlight the potential role of current nonhuman wealth in determining the point at which first-time ownership occurs.

3. Current Wealth in Previous Tenure Choice Studies

Despite the persuasive conceptual basis for current nonhuman wealth as a central and independent component of the household budget constraint in tenure models, current wealth has rarely been accorded a central role in empirical specifications of the tenure choice problem. Indeed, the only published tenure study that focuses primarily upon current wealth is Bossons (1978). Based upon 1963 U.S. Federal Reserve Board survey data, Bossons found a strong nonlinear current nonhuman wealth threshold effect upon the probability of ownership.

Current nonhuman wealth has also been featured in several studies focused upon explaining differences in the incidence of ownership by race (Birnbaum and Weston (1974), Roistacher and Goodman (1976) and Smith (1981)). Current wealth contributes significantly to the explanation of lower ownership incidence for blacks in these studies. To the extent these results are accepted they significantly affect the perception of the role of racial discrimination in explaining black-white ownership differences. Measures of current nonhuman wealth have been used in tenure choice analysis by Boehm (1980, 1982) and Boehm and McKenzie (1981), and in estimation of housing demand by Boehm and McKenzie (1981) and Goodman and Kawaii (1982).

However, all single equation tenure choice estimation models are vulnerable to the objection that current wealth is determined endogenously in a set of savings/investment/tenure equations; at any point of time, accumulated wealth depends upon prior tenure decisions. Indeed, skeptics of the current wealth effect believe that positive correlations between current wealth and ownership primarily reflects the

wealth creating attributes of past homeownership.[7] A related possibility is that homeownership tends to be selected by households with high savings rate preferences. Of course homeownership has not always been wealth creating either in absolute terms or relative to diversified financial asset portfolios as market experiences of the 1980's attest.

The common approach to dealing with the endogeneity issue is to use constructed or predicted nonhuman wealth measures in lieu of actual wealth (Henderson and Ioannides (1987), Haurin and Gill (1985), Steele (1979)). These methods have two serious deficiencies, however, First, and most important, the segregation of nonhuman wealth is important because of its presumed 'liquidness' relative to human capital; only current measured wealth has this attribute, not 'permanent' or 'predicted' wealth. Second, nonhuman wealth is extraordinarily difficult to predict; this may explain why most authors do not report their wealth estimating equations and those that do (e.g., Haurin and Gill) report equations with very little explanatory value, absolutely and in relation to income predictors. We tried many specifications of nonhuman wealth on household attributes for the 1977 and 1984 SCF databases and were unable to obtain equations with even minimal explanatory value. The very high variance in nonhuman wealth distribution in relation to earned income (Table 1) suggests that unobserved variables (including generational interfamily relationships) explain most of the wealth accumulation of young families.

The only way to be certain of correctly identifying the wealth/tenure relationship would be to include only those owner-occupiers who

recently selected ownership for the first time and to exclude current renters who had been owners previously. All the above referenced studies, along with nearly all tenure choices analyses, have included households with heads whose ages cover a wide range, many of whom would have been owners for an extended period. The current wealth hypothesis is neither confirmable or refutable with such samples. Since, as we have contended, the tenure issue of primary relevance is the choice of timing of first time ownership, tenure analysis should focus upon young households;[8] such a focus has the added benefit of substantially reducing the extent to which current wealth can be affected by previous tenure elections.

We estimate a conventional single reduced form tenure equation, but include household net worth as an explanatory variable. The ambiguity regarding the wealth/tenure relationship is investigated in several ways. First, we limit the life cycle range to household heads aged 18 to 34. Second, we provide cross section estimates for two distinctly different points in time: (1) 1977, a year near the end of an era in which realized after-tax returns to owership have been generally regarded as much superior to returns generated by financial assets, and (2) 1984, a year preceded by several years in which owner occupied homes were generally much inferior to financial assets as wealth creators.[9] Third, we estimate separate regressions for each geographic region as well as nationwide equations with regional dummies. Fourth, to further reduce any possibility of extended prior ownership contamination, we retest the results on a very young subsample (heads aged 18 to 26) and finally, where the data permits we limit

owners to those identifiable as recent purchasers. However, before proceeding to the empirical results, we make explicit the nature of the model that we perceive to determine the budget constraint while simultaneously resolving competing housing consumption and investment objectives.

III. Simultaneous Housing Consumption and Portfolio Decisions: Implications for the Relevant Budget Constraint

In the spirit of Henderson and Ioannides (1983) we visualize housing choices being made by households independently solving two optimization problems to determine (i) the optimal time stream of consumption of housing services and (ii) the optimal amount of owner-occupied housing in the household portfolio. Thus, we postulate that each household (1) determines $\hat{h}_i$, the quantity of housing services desired in the i^{th} period by maximizing expected utility in a multiperiod consumption function subject to a permanent income constraint, and (2) determines $\hat{H}_i$, the desired amount of owner-occupied housing in its portfolio in the i^{th} period by maximizing expected portfolio returns subject to wealth and risk constraints.

Housing services are assumed to be produced by households according to

$$\hat{h}_j = \phi_j f(u)H \qquad \begin{matrix} f' > 0 \\ f'' < 0 \end{matrix}$$

where ϕ_j represents the efficiency of the j^{th} household in producing services and $f(u)$ represents the utilization rate of the given housing asset, H. As indicated, more services can be generated by subjecting

the asset to a higher utilization but at a diminishing rate, and at any utilization rate applied to a given H, households with higher efficiency factors (ϕ) will produce higher level of services. Following Weiss (1978) the magnitude of ϕ_j may depend upon many household attributes including the value of time, maintenance and management ability and sociodemographic characteristics.

We presume that the variance of the efficiency factor (ϕ_j) across households is much larger in the case of ownership where household management capabilities are more fully tested than in rental occupancy. Consequently, the determination of the minimum cost input combination for production of any level of housing services will depend upon production functions and input prices which are household specific. Nonneutral taxes also produce after tax user costs of owner-occupied housing which are household dependent. However, we assume that with given factor input prices, housing services can be generated at constant unit cost from a given H stock over a relatively wide range of services. Finally, the lumpy character of units available for owner-occupancy is characterized by assuming a minimum H value exists in any market; $\min H_k$ represents the market value of a basic 'starter' ownership unit in the k^{th} market.

We visualize the j^{th} household residing in the k^{th} market selecting an optimal $\hat{H}_{ijk}$ in the i^{th} period from solution of its portfolio choice algorithm. Dropping the i and k subscripts for notational simplicity, if $\hat{H}_j < \min H$, the household will rent (Case I). If $\hat{H}_j > \min H$ and $\hat{h}_j$ can be efficiently produced in the minimum cost range of the cost function of housing services produced from $\hat{H}_j$,

then the household elects ownership (Case II). If $\hat{H}_j > \min H$ but $\hat{H}_j$ is too small to efficiently produce $\hat{h}_j$ (Case III), then some distortion of the time path of either consumption or the portfolio mix will occur. In this case young households facing small inequalities are likely to choose ownership while those with large discrepancies will be more likely to rent. In any event, only households in Case II will simultaneously achieve both $\hat{h}$ and $\hat{H}$ in this period. We expect the probability of a household being found in any Case to be functionally dependent upon the household's current nonhuman wealth, with the higher wealth households most likely to be found in Case II, followed by Case III and least likely to be in Case I. The likelihood that a household in Case III elects ownership should also be positively dependent upon the household's wealth endowment.

In the context of this view of the household decision process, the impact of permanent income upon the probability of an ownership election is not clear. Case I in which the rental option is virtually certain and Case III which presumptively includes a significant proportion of renters can include households with high permanent incomes in relation to their nonhuman wealth endowments as well as low and middle income households. Similarly, while Case II households must have significant current wealth, a wide range of observed permanent incomes can be consistent with owner-occupancy in this group. The quantity of $\hat{h}_j$ is assumed to be dependent upon permanent income; however the larger $\hat{h}_j$, the greater the probability a household will be found in Case III where rental choice is a significant possibility.

The presumed central importance of current nonhuman wealth in determining the timing of first time ownership is refutable. Our current wealth thesis is essentially a double threshold proposition. The first wealth threshold must be reached before ownership is an option. (Case I households are below the threshold.) At the second threshold virtually all households are owners. The current wealth hypothesis implies that current net worth is the primary budget constraint determining the probability that households situated between the two thresholds will own. However, the elasticity of the probability of ownership with respect to increments in net worth is expected to erode as the level of net worth approaches the second threshold. If this erosion takes place very quickly after net worth passes the first threshold, then the importance of current nonhuman wealth will be more limited than suggested and permanent (current) income will be the primary budget constraint for many households. For very high wealth households with net worth well in excess of the second threshold, some of the attributes of owner-occupied housing may lose their uniqueness and capital market imperfections will produce no binding constraints. For example, for such households the tax shelter attributes of owner-occupied housing may be of minor significance; thus some reversal of ownership incidence might occur with respect to net worth among these wealthy households. Bossons (1978) did find evidence of a slight reversal.

Permanent income might also dominate nonhuman wealth because it serves as a cushion against future variability in operating expenses and financing costs. Moreover, permanent earnings will matter if human

capital is more liquifiable in the capital markets than we have suggested and if lender income coverage constraints are based upon permanent earnings. Of course, if lenders impose rigidly defined Gross Debt Service Ratios and households desiring ownership are willing to borrow up to lender imposed limits then $\hat{H}_j$ will have an income elasticity of unity. Should lenders focus upon current income, then measured, not permanent, income will be expected to dominate current nonhuman wealth in the tenure decision process under this scenario.

Inherent in the portfolio choice approach is the expectation that the demand for owner-occupied housing will have a high cross elasticity with respect to prices and other characteristics of assets possessing similar attributes. Even though owner-occupied housing is presumed to enjoy some very unique attributes, Bossons (1978) has postulated that illiquid instruments are particularly likely to be close substitutes for equity in owner-occupied residences; this is also implicit in Plaut's (1987) emphasis upon financial assets as a hedge against long positions in risky owner-occupied housing. In the aggregate, the largest holdings of illiquid assets by households in the Survey of Consumer Finances data we are utilizing are represented by equity in real estate other than a primary residence and equity in a business or profession. The hypothesis is that young households with an observed taste for such assets will, ceteris paribus, be less likely to elect homeownership. We include dummy variables measuring the presence of such assets in our specification of an empirical tenure equation in order to test this proposition.

IV. Empirical Specification and Data Issues

1. Form of Specification

The dual optimization assumption is summarized in equations 1 and 2. To emphasize the form in which each budget component is viewed as being important, human capital is represented as a permanent (or current) earnings flow (E_j) for the j^{th} household and nonhuman capital as a stock, i.e., net worth (NW_j). Each is only shown in the demand equation in which it is considered to be most important.

$$\hat{h}_{jo} = h\left(E_j, \left(\frac{P_{ho}}{P_c}\right)_j, Z_j\right) \tag{1}$$

h_{jo} = housing service demand by j^{th} household in ownership mode

E_j = permanent (current) household earnings

$\left(\frac{P_{ho}}{P_c}\right)_j$ = the price per unit of housing services acquired via ownership relative to the price of other consumer goods

Z_j = a vector of the j^{th} household attributes affecting relative preferences for housing services

$$\hat{H}_j = H\left(NW_j, P_{minH}, \left(\exp\frac{r_{HE}}{r_p}\right)_j, ILA_j, W_j\right) \tag{2}$$

$\hat{H}_j$ = asset demand for owner-occupied housing by the j^{th} household

NW_j = current net worth of the j^{th} household

P_{minH} = asset price of the minimum housing unit available in the ownership market

$\left(\exp \frac{r_{HE}}{r_p}_j\right)$ = expected after tax return on housing equity realizable by the j^{th} household in relation to the expected after tax return on the same amount invested in a diversified portfolio of financial assets

ILA_j = a proxy for household j's preferences for illiquid assets which may be substitutes for owner-occupied housing in meeting portfolio balance contraints

W_j = a vector of household j's attributes reflecting attitudes toward portfolio risk-taking.

Following Artle and Variaya (1978), we assume each household views the lifetime cost of the optimal time path consumption of housing services to be cheaper in the ownership mode. However, ownership does not occur until: (1) $\hat{H} > minH$, (2) portfolio diversification and balance objectives are satisfied (W_j, ILA_j), and (3) other household attributes (tax bracket and mobility proxies) signal that the household has, in fact, reached a life cycle position in which it will benefit from ownership. Some households never achieve these conditions and remain tenants throughout their life cycle A third $(\hat{h}_{jr})$ equation (not shown) determines the j^{th} household's housing service consumption if the rental mode is chosen.

Ideally, we would like to proceed by estimating $\hat{h}_o$ and $\hat{H}$ for each household, estimate a transformation cost function that would determine a minH for each $\hat{h}$, $H(\hat{h})$, and use $H/\hat{H}(h)$ as a

predictor of tenure choice. However, in order to focus upon the budget constraint issue we have elected to utilize a data base which is rich in micro balance sheet and income data and in doing so, we sacrificed measures of housing service demand; there are no expenditure data in the Survey of Consumer Finance database and therefore no measure of housing services consumed by renters. Consequently, we estimate the reduced form ownership likelihood function represented by equation (3).

$$P(\text{owning})_j = p\left(NW_j,\ E_j,\ ILA_j,\ \left(\frac{P_{ho}}{P_c}\right)_j,\ P_{minH},\ \left(\exp\frac{r_{HE}}{r_p}\right)_j,\ Z_j,\ W_j\right) \quad (3)$$

Equation (3) has the form of most tenure choice equations estimated in the literature except for its special emphasis upon the role of current balance sheet variables.

2. The Data Base

The data base utilized to test the alternative budget constraint hypotheses is the microdata tape prepared by Statistics Canada from the 1977 and the 1984 Surveys of the Consumer Finances (SCF). This data set provides a cross section of family units as of May 1977 (1984); income is reported for the calendar year 1976 (1983). The primary advantage of this data base is that it includes detailed balance sheet data on surveyed economic family units; this balance sheet information is collected in the Surveys at seven year intervals. A peculiar advantage of using Canadian household data is that the universality of very short term loans, and the absence of rate caps on variable rate loans, insures that observed book values of mortgage balances are a good proxy for market values; the much greater discrepancies between book and market values of mortgage debt among U.S. households creates significant

problems in estimating current net worth of owner households in the U.S. The family units are selected from a multi-stage, stratified clustered probability sample from a universe including virtually every private family unit in Canada.[10] Although earlier surveys were criticized (Davies 1979) for underreporting of assets and liabilities, the quality of the 1977 and 1984 Surveys appear to be quite high in this regard.[11] The most serious data deficiencies for our purposes, in addition to the absence of expenditure data, are (i) the lack of information on purchase price and date of purchase of owner occupied homes and (ii) the sparseness of information on household location, i.e., family units are aggregated into broad geographic regions.

The absence of home purchase date and price information are important because they relate directly to the issue of distinguishing the impact of current wealth endowments upon tenure choice from the possible impact of past tenure choice upon current wealth. The lack of market area location identification necessitates the omission of variables representing $\frac{P_{ho}}{P_c}$ and $\exp\frac{r_{HE}}{r_p}$. We can only provide a very crude representation of P_{minH} for each region. Omission of price and expected return variables is a potentially serious source of bias in estimation of coefficients on the key wealth, income and attribute variables.

3. Subsample Selection

The base regression results were obtained from a subsample of family units selected on the basis of containing a married couple with an employed head aged 18 to 34 living in an urban area of population of

100,000 or more. Only units with married couples were selected for two reasons. First, only family units containing married couples can be presumed to be households. Second, life cycle consumption oriented theories of tenure choice treat marriage and the presence of children as attributes which increase the probability of ownership being elected, either because they are associated with reduced mobility (lower transactions costs) or with preferences for housing service components peculiarly obtainable through ownership. By selecting the household type which traditionally prefers ownership, we can focus upon identifying the budget concept most clearly determining the ability of households to consummate their ownership preference. In order to have less noise for the purpose of estimating permanent income (or interpreting current income as a proxy for permanent income) we restricted the subsample to households with employed heads.

The limitation to households residing in the larger urban areas was imposed for two reasons. First, urban areas appear to impose greater obstacles to homeownership (e.g., higher P_{minH} barriers) as well as more complete rental markets than nonurban areas. Second, richer house price information is available for urban areas. The only plausible estimates of P_{minH} we could construct were based upon metropolitan area prices. The incidence of ownership among the urban, married, employed head aged 18-34 subsample was 53 percent in both 1977 and 1984.

4. Estimation Method and Variable Measurement

Empirical explanation of household tenure decisions is a probabilistic binary choice problem. We estimated each regression

utilizing two different approaches, namely (i) OLS estimation of the linear probability model and (ii) maximum likelihood estimation of the logit model. Although there are conceptual deficiencies associated with each method, as well as with the probit alternative, the choice method is not critical given our estimation objectives (which do not include prediction) and our quite large samples. In this situation, comparative empirical studies have indicated that the coefficient results generated by these alternative methods are usually indistinguishable (Pindyck and Rubinfeld (1976), p. 251). We, in fact, found each pair of linear probability and logit estimates to be indistinguishable; we report the logit results here.

We also estimated each regression (i) treating all household observations as equally weighted, and (ii) applying the sample weights which take into account the stratification feature of the SCF sample design. The case for utilizing the weights is presented in Statistics Canada (February 1980). However, Dumouchel and Duncan (1983) have shown that use of sample survey weights in regression analysis can only be justified on the basis of very refined assumptions regarding the underlying model being estimated. We found no substantive differences between the weighted and unweighted regression results; occasionally a secondary variable is significant in one version but not in the other. We report the unweighted results.

The variables representing household budget constraints have been chosen to be net worth and total family earnings from employment. This represents a clean separation of the roles of human and nonhuman capital as components of a household's economic resources. A gross earning

concept is employed since there is no feasible way to estimate the after-tax component of income attributable to earnings and because of the simultaneity between tenure choice and tax bracket. Each equation is estimated once using current earnings and a second time using permanent earnings obtained from a regression of total earnings upon a variety of household attributes. We report whichever equation produces stronger support for the income constraint as the budget determinant of tenure choice. A variety of sociodemographic variables are included as proxies for utility function and risk aversion parameters.

The budget constraint variables are normalized by an estimate of the current price of a basic house in each region. The basic house price is measured as the average sale price of new housing units financed by standard approved NHA loans in metropolitan areas; we averaged the prices reported by CMHC for 1977 and 1984 across the CMAs for each region. This is a crude index for the purpose because there is no necessary regional consistency in the composition of housing units included; also it is clear that this average price exceeds the market values of 'starter' homes in the urban areas of each region. However, this series provides a better representation of lower price houses in a CMA than do alternative data sources; this is because NHA financed new homes primarily represent lower priced housing in fringe areas (Scheffman, 1978). Moreover, the relative homogeneity of new units financed by NHA minimizes to the extent possible the regional inconsistenies in types of units represented.

As discussed in Section III, the form of the tenure choice function is expected to be distinctly nonlinear in the budget constraint variables. In order not to prejudge the nature of the nonlinearities

while being able to observe the (non)existence of specific nonlinearities (e.g., reversal of ownership likelihood at high levels of net worth or earnings), we partition the continuous normalized budget variables into cohorts and treat the cohorts as independent variables. The disadvantage of this approach is that it may create independent variables that are significantly collinear and could introduce errors-in-variables measurement problems. In fact, however, the multicollinearity does not occur either among or between the net worth and earnings cohorts; indeed current wealth and current earnings are remarkably uncorrelated. This is consistent with the view that the distribution of current wealth among young households in a (conventionally assumed) dissaving period of their life cycle is largely determined by exogenous gifts and bequests. It may, however, also be consistent with a saving/investment dynamic among young marrieds which is dominated by the objective to achieve home ownership.

V. The Regression Evidence

1. Base Case Results: 1977

Variable names utilized in reporting the logit results and permanent income estimates are defined in Table 2 and descriptive statistics for the continuous variables are provided in Table 3. Particularly noteworthy is the indication in Table 3 that current net worth endowments have much larger variances among even very young households than current or estimated permanent earnings. The regression equations from which TEP estimates are derived are reported in the notes to the logit tenure likelihood results (Tables 4, 5 and 6).

TABLE 2

Variable Definitions

Variable Name	Definition
TE	Total Household Earnings
TEP	Estimated Household Permanent Earnings
NW	Household Net Worth
BHPN*	Price of a Basic New Dwelling Unit
TEBHPN	TE ÷ BHPN
TEBHPN1	Equals 1 if TEBHPN $\leq$ .24; otherwise zero
TEBHPN2	Equals 1 if TEBHPN > .24 and $\leq$ .36; otherwise zero
TEBHPN3	Equals 1 if TEBHPN > .36 and $\leq$ .49; otherwise zero
TEBHPN4	Equals 1 if TEBHPN > .49 and $\leq$ .62; otherwise zero
TEBHPN5	Equals 1 if TEBHPN > .62 and $\leq$ .75; otherwise zero
TEBHPN6	Equals 1 if TEBHPN > .75; otherwise zero
TEPBHPN	TEP ÷ BHPN
TEPBHPN1, 2 and 3	Defined identically to TEBHPN1, 2 and 3
TEPBHPN4	Equals 1 if TEPBHPN > .49; otherwise zero
NWBHPN	NW ÷ BHPN
NWBHPN1	Equals 1 if NWBHPN < 0; otherwise zero
NWBHPN2	Equals 1 if NWBHPN > 0 and $\leq$ .10; otherwise zero
NWBHPN3	Equals 1 if NWBHPN > .10 and $\leq$ .24; otherwise zero
NWBHPN4	Equals 1 if NWBHPN > .24 and $\leq$ .39; otherwise zero
NWBHPN5	Equals 1 if NWBHPN > .39 and $\leq$ .59; otherwise zero
NWBHPN6**	Equals 1 if NWBHPN > .59 and $\leq$ .89; otherwise zero
NWBHPN7	Equals 1 if NWBHPN > .89 and $\leq$ 1.29; otherwise zero
NWBHPN8	Equals 1 if NWBHPN > 1.29; otherwise zero.

TABLE 2 (Continued)

OCC/OCCUP	Occupation of Household Head
OCC1	Equals 1 if Managerial and Administrative, Natural Sciences, Engineering, Mathematics, Social Sciences, Religion, Teaching, Medicine and Health, Artistic, Recreational and Related Occupations; zero otherwise
OCC2	Equals 1 if Clerical, Sales or Services; zero otherwise
OCC3	Equals 1 if Farming, Horticultural and Animal Husbandry, Fishing, Trapping, Forestry, Logging, Mining and Quarrying, Processing and Machinery; zero otherwise
OCC4	Equals 1 if Product Fabricating, Assembling and Repairing; zero otherwise
OCC5	Equals 1 if Construction Trades; zero otherwise
OCC6	Equals 1 if Transport Equipment Operations, Materials Handling, Other Crafts and Equipment Operations; zero otherwise
OCCUP1	Equals 1 if Managerial and Administrative; zero otherwise
OCCUP2	Equals 1 if Equals OCC1 less OCCUP1; zero otherwise
OCCUP4	Equals 1 if Sales; zero otherwise
OCCUP5	Equals 1 if Services or OCC3 or OCC4; zero otherwise
OCCUP9	Equals 1 if Equals OCC5; zero otherwise
OCCUP10	Equals 1 if Equals OCC6; zero otherwise
E	Education Level Achieved by household head
E1	Equals 1 if No Schooling or Elementary (8 years or less); zero otherwise
E2	Equals 1 if 9 or 10 Years of Schooling; zero otherwise
E3	Equals 1 if 11-13 Years of Schooling; zero otherwise
E4	Equals 1 if Some post-secondary education; zero otherwise
E5	Equals 1 if Post-secondary Certificate or Diploma; zero otherwise
E6	Equals 1 if University Degree; zero otherwise
AGE	Age of Head
AGE1	Equals 1 if Head's Age is 18 to 24; zero otherwise
AGE2	Equals 1 if Head's Age is 24 to 29; zero otherwise
AGE3	Equals 1 if Head's Age is 29 to 34; zero otherwise

TABLE 2 (Continued)

R1	Equals 1 if Household resides in the Atlantic Provinces; zero otherwise
R2	Equals 1 if Household resides in Quebec; zero otherwise
R3	Equals 1 if Household resides in Ontario; zero otherwise
R4 (1977)	Equals 1 if Household resides in the Prarie Provinces; zero otherwise
R4 (1984)	Equals 1 if Household resides in Manitoba or Saskatchewan; zero otherwise
R5 (1977)	Equals 1 if Household resides in British Columbia; zero otherwise
R5 (1984)	Equals 1 if Household resides in Alberta; zero otherwise
R6 (1984)	Equals 1 if Household resides in British Columbia; zero otherwise
SELFE	Equals 1 if Head is Self Employed; zero otherwise
NOE	Equals 1 if there is more than One Earner in Household; zero otherwise
CHILD	Equals 1 if there are One or More Children in Household 17 Years of Age or Less; zero otherwise
CHILD1	Equals 1 if Household contains no children under 17; zero otherwise
CHILD2	Equals 1 if Household contains child under 7; zero otherwise
CHILD3	Equals 1 if Household only contains children 7 years of age or older; zero otherwise
PENSION	Equals 1 if any Earner is covered by an Employer Sponsored Pension Plan; zero otherwise
ORE	Equals 1 if Household Owns Investment Real Estate or a Vacation Home; zero otherwise
BPEQ	Equals 1 if Household Net Worth includes Equity in a Business or Profession; zero otherwise
IMMIG	Equals 1 if Head is Immigrant who arrived in 1946 or later; zero otherwise

*Derived from CMHC series, 'Prices of New Houses Financed Under NHA', CMHC Housing Statistics Table (1977) and Table 82 (1984). Regional BHPN's are averages of CMA prices for each CMA with population over 100,000. The means and standard deviations of regional prices for 'basic' housing units computed in this way are:

	1977	1984
Region 1	$37320 (628)	$71308 (8583)
2	36502 (4892)	60658 (3359)
3	50567 (6891)	82493 (13074)
4	51129 (11554)	77466 (8134)
5	49675 (1812)	92979 (3764)
6	-	97998 (3202)

The 'Regions' correspond to the 'R' definitions in the table.

**In Table 6 below NWBHPN6 is defined openendedly as 'Equals 1 if NWBHPN > .59; otherwise zero.'

TABLE 3

Variable Means and Standard Deviations
by Age of Head and Survey Year

Variable Name	Age 18-34		Age 18-26	
	1977	1984	1977	1984
TE	18577 (838)	33280 (15579)	16117 (7552)	27060 (12809)
TEP	17372 (5450)	30439 (9575)	15024 (5034)	24664 (7940)
TEBHPN	.415 (.197)	.434 (.207)	.356 (.175)	.360 (.177)
TEPBHPN	.388 (.132)	.398 (.138)	.331 (.121)	.330 (.120)
NW	24009 (36182)	39515 (58615)	10696 (26231)	17706 (37210)
NWBHPN	.519 (.753)	.503 (.732)	.229 (.538)	.232 (.461)

Columns IA and IB of Table 4 present the logit results for 1977 using current and permanent household earnings, respectively, exclusive of evidence on current wealth. As indicated above, earnings are normalized by the applicable regional basic house price series. Since there are very few households with observed TEP greater than .49 BHPN, fewer cohorts are available when TEP is utilized. In accord with the conventional view, permanent (current) household earnings significantly positively affect the likelihood that a household owns its home. Cohort earnings elasticities of .13 to .22 using current earnings and .08 to .16 using TEP are in the lower range of income elasticities reported in the tenure choice literature. Household attributes which appear to induce higher probabilities of ownership among young marrieds are (i) the presence of children (ii) an older household head (iii) a head employed in an administrative/professional occupation (broadly defined) with an employer sponsored pension plan and (iv) residence outside Quebec. Also, contrary to our model hypothesis, investments in illiquid assets (ORE or BPEQ) are positive and significant.

Thus a base case household with low earnings (TEBHPN < .24), no children, head under 25, little education, located in Quebec, etc. has virtually no likelihood (literally 1.9% from Equation IA) of owning; if the same household had total earnings in excess of .75 BHPN the ownership probability (Equation IA) rises to 27 percent. A 'low' earnings household with children, a head aged 26 with a high school degree and resident in Ontario has a ownership probability from Equation IA of 45 percent; a 'high' earnings household with the same attributes has a 94 percent probability of owning, consistent with our suggested

TABLE 4

Tenure Choice for Urban Married Households
With Employeed Heads Aged 18 to 34
1977

Dependent: Owner = 1 Renter = 0

	IA	IB	II	III
*TEBHPN2	1.07 (4.61)	.743 (2.52)	.627 (1.45)	
3	1.50 (6.20)	1.45 (3.68)	.842 (1.48)	
4	1.97 (6.96)	2.23 (4.29)	1.42 (1.89)	
5	2.62 (6.55)			
6	2.93 (7.02)			
NWBHPN2			.622 (1.24)	.624 (1.25)
3			3.14 (7.04)	3.13 (7.06)
4			4.01 (8.70)	4.07 (8.86)
5			5.49 (10.84)	5.48 (10.87)
6			6.58 (11.56)	6.59 (11.59)
7			6.03 (10.31)	6.09 (10.47)
8			6.06 (10.74)	6.07 (10.86)
ORE	.607 (2.58)	.780 (3.40)	-.528 (1.90)	-.503 (1.81)
BPEQ	.801 (2.69)	.880 (3.10)	-.684 (1.92)	-.663 (1.86)
AGE2	.717 (3.12)	.634 (2.65)	-.002 (.005)	.193 (0.65)
AGE3	1.31 (5.36)	1.07 (2.77)	.033 (.086)	.375 (1.17)
PENSION	.506 (3.35)	.424 (2.54)	.404 (1.69)	.619 (3.05)
NOE	-.197 (1.18)	-.363 (1.72)	.174 (0.58)	.169 (0.77)
CHILD	1.25 (7.39)	1.21 (7.42)	1.37 (6.08)	1.32 (5.93)
IMMIG	-.297 (0.17)	-.271 (1.62)	-.494 (2.13)	-.538 (2.35)
E2	-.189 (0.61)	-.073 (0.30)	.394 (0.91)	.386 (0.89)
E3	.098 (0.34)	.031 (0.28)	.050 (0.12)	.230 (0.59)
E4	.199 (0.60)	.174 (0.32)	.120 (0.26)	.266 (0.60)

TABLE 4 (Continued)

	IA	IB	II	III
E5	.484 (1.49)	.433 (0.32)	.215 (0.46)	.386 (0.86)
E6	-.220 (0.64)	-.319 (0.35)	-.556 (1.10)	-.165 (0.36)
SELFE	-.612 (1.45)	-.499 (1.23)	-.443 (0.89)	-.627 (1.30)
OCC2	-.169 (0.80)	-.188 (0.92)	-.169 (0.59)	-.193 (0.67)
OCC3	-.820 (2.90)	-.791 (2.83)	-.305 (0.77)	-.416 (1.08)
OCC4	-.366 (1.37)	-.347 (1.33)	-.463 (1.23)	-.542 (1.46)
OCC5	-.583 (2.05)	-.651 (2.34)	-.807 (2.10)	-.697 (1.85)
OCC6	-.286 (1.03)	-.318 (1.17)	-.083 (0.22)	-.164 (0.44)
R1	.670 (2.35)	.886 (3.05)	1.02 (2.33)	.788 (1.90)
R3	1.56 (7.93)	1.56 (7.36)	1.76 (5.84)	1.44 (5.88)
R4	1.30 (5.39)	1.36 (5.11)	1.11 (3.01)	.748 (2.47)
R5	1.32 (4.60)	1.33 (4.60)	1.02 (2.54)	.762 (2.03)
Asymptotic t statistics in ( ).				
Constant	-3.94	-3.94	-5.87	-5.55
Likelihood Ratio Test	416.85 (28 D.F.)	356.81 (26 D.F.)	919.80 (33 D.F.)	915.85 (30 D.F.)
McFadden $\overline{R}^2$	.250	.197	.539	.538
Percent Right Predictions	74.5	73.0	87.6	88.0
Number of Observations	1204	1204	1204	1204

*Equation IA utilizes measured total household earnings. Equations IB and II utilize an estimate of permanent earnings derived from the following regression estimate:

$$
\begin{aligned}
\text{LnTEP} = {} & 5.61 + \underset{(9.25)}{.990}\ \text{LnAGE} + \underset{(11.84)}{.301}\ \text{NOE} - \underset{(2.98)}{.190}\ \text{SELFE} + \underset{(8.44)}{.168}\ \text{PENSION} \\
& + \underset{(3.52)}{.209}\ \text{OCC1} + \underset{(1.22)}{.068}\ \text{OCC2} + \underset{(3.44)}{.201}\ \text{OCC4} + \underset{(0.79)}{.040}\ \text{OCC5} + \underset{(3.44)}{.205}\ \text{OCC9} \\
& + \underset{(0.80)}{.047}\ \text{OCC10} + \underset{(4.33)}{.155}\ \text{E3} + \underset{(1.87)}{.084}\ \text{E4} + \underset{(3.21)}{.144}\ \text{E5} + \underset{(6.26)}{.309}\ \text{E6} \\
& - \underset{(1.53)}{.046}\ \text{CHILD2} - \underset{(0.56)}{.032}\ \text{CHILD3} - \underset{(1.80)}{.027}\ \text{IMMIG} - \underset{(3.25)}{.163}\ \text{R1} + \underset{(2.69)}{.084}\ \text{R3} \\
& + \underset{(0.53)}{.021}\ \text{R4} + \underset{(1.85)}{.091}\ \text{R5} \qquad (\text{t statistics in ( )}).
\end{aligned}
$$

$\overline{R}^2 = .328$ SE = .429 F = 29.01 N = 1204

interpretation of Table 1 above. Using permanent earnings (col IB) produces very similar results. Thus the conventional wisdom appears confirmed; the transition to ownership is driven by the interaction of permanent (current) returns from human capital and household life cycle and location characteristics. The only portfolio objective variables included have the wrong sign.

A different view is obtained, however, when current nonhuman wealth (net worth) is included as a budget constraint component (Equation II). First, net worth appears to be a much more potent trigger to tenure transition than earnings. The changes in the AGE cohort and ORE and BPEQ coefficients suggests that they served as crude proxies for current wealth in Equations IA and IB. The illiquid asset variables now have the hypothesized negative signs. The permanent earnings cohort elasticities are little affected (.11 to .13), while the NWBHPN cohort elasticities range between .21 and .40 once net worth exceeds ten percent of BHPN. As postulated, there is evidence of a modest reversal in ownership likelihood in the high net worth cohorts.

Using Equation II literally, a household with low earnings (TEBHPN < .24) and low (but positive) net worth ($0 < \text{NWBHPN} \leq .10$) and base attributes (head under age 24 with less than eight years education, Quebec residence, no children, etc. has a nil (less than 1%) chance of owning; a similar household with children, a (say) 25 year old head with a high school education residing in Ontario has just a 12 percent probability of owning. Providing the same household with permanent earnings greater than .49 BHPN increases the probability of ownership to 36 percent; however, endowing the household with net worth of .65 BHPN

will make it virtually certain to be an owner (98% probability) even though it is in the lowest earnings cohort. Thus, these results suggest that some households with attributes predisposing them to ownership are able to achieve ownership through human capital liquification without accumulating current nonhuman wealth; however, predisposed households who cross a net worth threshold are very highly likely to achieve ownership, regardless of their permanent earnings. As Equation III shows, the net worth coefficients are essentially unaffected by deleting earnings cohorts from the regression equation. Competition from nonhousing illiquid assets reduces ownership likelihoods substantially for households with modest net worths, but has relatively marginal depressing effects upon households with relatively high net worth (say .5 NWBHPN or above).

2. Separating Current Wealth from Prior Homeownership

As discussed above there should exist concern regarding whether a strong positive relationship between the incidence of homeownership and current wealth reflects the importance of net worth accumulation in triggering first-time ownership or, to the contrary, reflects the wealth creating history of prior ownership. We reduced the likelihood of the latter possibility by truncating the sample to households with heads aged less than 35. Nonetheless, it is arguable that the comparative after tax returns to home ownership were sufficiently superior to returns from generally available investment opportunities in the early to mid-1970's, that the 1977 net worths of even young households were systematically impacted by the tenure mode chosen over prior years.

Consequently, we have tested the robustness of the current wealth findings in several ways.

First, in contrast to earlier versions of these results (Jones (1985, 1986)), we now have available the 1984 SCF database. As previously observed, the disinflationary era of the early eighties effectively reversed the 1970's experience and, generally, diversified financial asset portfolios were better wealth creators than home-ownership. If the wealth/tenure relationship existing in 1977 was caused by the portfolio mix implications of prior tenure choice, then this relationship should be much weaker, if not negative, for young households in 1984.

However, the logit regression results reported in Table 5 look remarkably similar to the 1977 results. Cohort elasticities for the NWBHPN cohorts fall in the same range as the 1977 results but the TEPBHPN are all below .10. As before the AGE cohort coefficients are much smaller (and become insignificant) when net worth is allowed for and the illiquid asset measures acquire their postulated negative coefficients. However, unlike the 1977 results, there is no reversal in ownership likelihood in the high net worth cohorts; not only does the probability of ownership continue to increase with net worth, but the highest cohort elasticities are in the two highest cohorts. Using Equation II for households resident in Ontario, with children, a 26 year old head with a high school education and highest cohort permanent earnings combined with low (but positive) net worth produces a probability of ownership equal to only 6.8 percent. The same household with Cohort 6 net worth (as in the 1977 illustrations) has an 84 percent

TABLE 5

Tenure Choice for Urban Married Households
With Employed Heads Aged 18 to 34
1984

Dependent: Owner = 1 Renter = 0

	IA	IB	II	III
*TEBHPN2	.931 (3.89)	.505 (1.57)	.285 (0.62)	
3	1.50 (6.31)	.987 (2.28)	.506 (0.82)	
4	2.23 (8.00)	1.50 (2.66)	.843 (1.04)	
5	2.38 (7.34)			
6	2.54 (6.52)			
NWBHPN2			-.088 (0.17)	.092 (0.17)
3			3.00 (6.31)	2.98 (6.27)
4			4.54 (9.05)	4.55 (9.08)
5			4.96 (9.63)	4.97 (9.67)
6			5.00 (9.50)	5.00 (9.50)
7			6.02 (10.19)	6.03 (10.22)
8			7.20 (9.30)	7.21 (9.33)
ORE	.891 (4.19)	.980 (4.73)	-.485 (1.90)	-.474 (1.86)
BPEQ	.941 (3.61)	.614 (2.51)	-.345 (1.07)	-.345 (1.07)
AGE2	.634 (2.47)	.681 (2.56)	.161 (0.45)	.303 (0.93)
AGE3	1.30 (4.90)	1.29 (4.05)	.581 (1.31)	.877 (2.60)
NOE	-.422 (2.41)	-.380 (1.65)	-.371 (1.11)	-.131 (0.55)
CHILD	.884 (5.75)	.787 (5.42)	1.18 (5.71)	1.17 (5.70)
IMMIG	-.364 (1.93)	-.286 (1.48)	-.817 (2.90)	-.939 (3.65)
E2	.022 (0.60)	.008 (0.21)	.524 (1.01)	.520 (1.01)
E3	.457 (1.37)	.449 (1.35)	.364 (0.77)	.461 (1.01)
E4	.069 (0.18)	.071 (0.19)	-.261 (0.49)	-.110 (0.22)
E5	.491 (1.36)	.456 (1.23)	-.005 (.009)	.176 (0.37)
E6	.626 (1.65)	.604 (1.55)	.004 (.007)	.202 (0.39)
SELFE	-.864 (2.25)	-.703 (1.83)	-.857 (1.62)	-1.08 (2.21)

TABLE 5 (Continued)

OCC2	.172 (0.84)	.125 (0.61)	.504 (1.68)	.380 (1.36)
OCC3	.087 (0.33)	.238 (0.87)	.700 (1.80)	.548 (1.52)
OCC4	.190 (0.76)	.236 (0.91)	.099 (0.28)	.055 (0.17)
OCC5	.086 (0.29)	-.111 (0.38)	.071 (0.17)	.018 (.045)
OCC6	.030 (0.11)	-.023 (0.09)	.401 (1.03)	.245 (0.67)
R1	.257 (0.86)	.211 (0.71)	.414 (0.96)	.257 (0.63)
R3	1.02 (5.30)	.907 (4.37)	.986 (3.41)	.816 (3.36)
R4	1.16 (4.10)	1.07 (3.84)	1.19 (3.12)	1.07 (2.94)
R5	0.99 (4.11)	.970 (3.43)	1.48 (3.67)	1.21 (3.82)
R6	1.20 (3.88)	1.11 (3.12)	1.32 (2.64)	.997 (2.51)
Asymptotic t statistics in ( ).				
Constant	-3.70	-3.04	-5.44	-5.22
Likelihood Ratio Test	354.92 (28 D.F.)	266.47 (26 D.F.)	841.81 (33 D.F.)	840.54 (30 D.F.)
McFadden $\overline{R}^2$	.200	.146	.506	.506
Percent Right Predictions	71.4	69.6	86.1	86.2
Number of Observations	1171	1171	1171	1171

*Equation IA utilizes measured total household earnings. Equations IB and II utilize an estimate of permanent earnings derived from the following regression estimate:

$$\begin{aligned}\text{LnTEP} = {} & 5.11 + \underset{(9.81)}{1.32}\ \text{LnAGE} + \underset{(10.75)}{.347}\ \text{NOE} - \underset{(4.58)}{.339}\ \text{SELFE} \\ & + \underset{(2.41)}{.166}\ \text{OCC1} + \underset{(1.34)}{.090}\ \text{OCC2} + \underset{(0.79)}{.059}\ \text{OCC4} - \underset{(0.70)}{.042}\ \text{OCC5} + \underset{(1.91)}{.149}\ \text{OCC9} \\ & - \underset{(0.60)}{.043}\ \text{OCC10} + \underset{(3.14)}{.149}\ \text{E3} + \underset{(3.40)}{.210}\ \text{E4} + \underset{(4.44)}{.256}\ \text{E5} + \underset{(4.96)}{.306}\ \text{E6} \\ & - \underset{(0.92)}{.032}\ \text{CHILD2} - \underset{(1.13)}{.076}\ \text{CHILD3} - \underset{(5.31)}{.056}\ \text{IMMIG} - \underset{(0.81)}{.053}\ \text{R1} + \underset{(1.35)}{.054}\ \text{R3} \\ & + \underset{(1.72)}{.102}\ \text{R4} + \underset{(0.54)}{.028}\ \text{R5} + \underset{(0.45)}{.030}\ \text{R6} \quad (t \text{ statistics in } (\,)).\end{aligned}$$

$\overline{R}^2 = .259$ SE = .523 F = 20.51 N = 1171

probability of owning even if it is in the lowest earnings cohort; being in the highest permanent earnings cohort just increases the probability to 92 percent.[12]

As an additional method of ensuring that observed owner households have enjoyed only brief ownership tenures, we reestimated the equations for households with heads aged only 18 to 26; results from the Equation II format from Tables 4 and 5 are reported in Table 6. The 'Pension' variable is missing from all 1984 equations because the requisite question was not included in the 1984 SCF, and the NWBHPN7 and 8 cohorts, E2 and SELFE are not represented due to a lack of observations. Even for this very young subsample, current net worth dominates earnings from human capital in explaining tenure choice. A household living in Ontario, with children and a head with a high school education has an ownership probability in 1977 (1984) of only 40% (10%) if it is a high permanent earnings/low net worth (as previously defined) family and a 99.8% (91.8%) likelihood of owning if it is a low permanent earnings but high net worth family. The similarity of results for these very young marrieds suggests that the timing and amount of intergenerational wealth transfers may have a major role in explaining tenure distribution among the young (30% of the 18-26 age subset were owners in 1977 and 26% in 1984).

3. Some Caveats and Additional Evidence

A common problem in housing demand and tenure choice studies is the absence or inadequacy of price data. In principle, omission or misspecification of prices can seriously bias the estimates of coefficients and elasticities of the budget constraint variables of interest.

TABLE 6

Tenure Choice for Urban Married Households
With Employed Heads Aged 18 to 26

Dependent: Owner = 1 Renter = 0

	I (1977)	II (1984)
TEPBHPN2	.096 (0.13)	-.346 (0.46)
3	.228 (0.22)	.512 (0.61)
4	.285 (0.23)	1.55 (1.39)
NWBHPN2	.932 (1.22)	-.284 (0.30)
3	3.27 (4.45)	2.93 (3.16)
4	4.76 (5.78)	4.61 (4.53)
5	6.15 (6.00)	5.51 (4.98)
6	7.70 (7.06)	5.85 (5.24)
ORE	-2.69 (3.25)	-1.03 (1.63)
BPEQ	-1.32 (1.55)	-.583 (0.85)
PENSION	.374 (0.81)	
NOE	-.167 (0.23)	.127 (0.18)
CHILD	1.55 (3.69)	1.61 (3.39)
IMMIG	-.056 (0.10)	-.539 (0.86)
E3	.360 (0.60)	.132 (0.20)
E4	.463 (0.69)	-.498 (0.56)
E5	-.509 (0.60)	-.300 (0.37)
E6	-.947 (0.98)	-1.21 (1.23)
OCC2	-.658 (1.15)	.720 (1.14)
OCC3	-.429 (0.61)	1.83 (2.49)
OCC4	-1.12 (1.47)	1.02 (1.35)
OCC5	-1.55 (1.83)	-1.01 (1.14)
OCC6	-.383 (0.55)	.686 (0.91)
R1	1.29 (1.45)	1.45 (1.23)
R3	1.40 (2.34)	1.77 (2.95)
R4	-0.21 (0.24)	1.88 (2.80)

R5	1.31 (1.54)	.809 (1.11)
R6		1.89 (2.08)
Asymptotic t statistics in ( ).		
Constant	-5.04	-6.32
Likelihood Ratio Test	244.28	171.85
McFadden $\overline{R^2}$	.506	.474
Percent Right Predictions	89.2	86.9
Number of Observations	371	314

*Permanent Earnings are derived from the following regression estimates:

I (1977)

$$\begin{aligned}\text{LnTEP} = {} & 3.70 + \underset{(5.06)}{1.59}\ \text{LnAGE} + \underset{(8.04)}{.440}\ \text{NOE} - \underset{(0.78)}{.193}\ \text{SELFE} + \underset{(4.37)}{.169}\ \text{PENSION} \\ & + \underset{(0.25)}{.032}\ \text{OCC1} - \underset{(0.44)}{.043}\ \text{OCC2} + \underset{(0.78)}{.088}\ \text{OCC4} + \underset{(0.33)}{.028}\ \text{OCC5} - \underset{(0.59)}{.006}\ \text{OCC9} \\ & + \underset{(0.80)}{.078}\ \text{OCC10} + \underset{(1.70)}{.114}\ \text{E3} - \underset{(0.26)}{.022}\ \text{E4} + \underset{(0.58)}{.055}\ \text{E5} + \underset{(1.66)}{.191}\ \text{E6} \\ & - \underset{(1.40)}{.074}\ \text{CHILD2} - \underset{(0.09)}{.032}\ \text{CHILD3} - \underset{(0.66)}{.025}\ \text{IMMIG} - \underset{(3.58)}{.377}\ \text{R1} + \underset{(0.94)}{.060}\ \text{R3} \\ & - \underset{(1.74)}{.131}\ \text{R4} - \underset{(0.56)}{.054}\ \text{R5} \qquad (t \text{ statistics in } ( )).\end{aligned}$$

$\overline{R^2}$ = .327 SE = .455 F = 9.18 N = 371

II (1984)

$$\begin{aligned}\text{LnTEP} = {} & 0.783 + \underset{(5.79)}{2.69}\ \text{LnAGE} + \underset{(5.38)}{.399}\ \text{NOE} - \underset{(2.43)}{.491}\ \text{SELFE} \\ & + \underset{(0.78)}{.112}\ \text{OCC1} + \underset{(0.30)}{.040}\ \text{OCC2} - \underset{(0.25)}{.037}\ \text{OCC4} - \underset{(1.06)}{.112}\ \text{OCC5} + \underset{(0.81)}{.114}\ \text{OCC9} \\ & - \underset{(0.37)}{.048}\ \text{OCC10} + \underset{(0.51)}{.048}\ \text{E3} + \underset{(2.92)}{.363}\ \text{E4} + \underset{(2.60)}{.285}\ \text{E5} + \underset{(0.77)}{.108}\ \text{E6} \\ & + \underset{(0.68)}{.036}\ \text{CHILD2} + \underset{(1.43)}{.354}\ \text{CHILD3} - \underset{(1.90)}{.047}\ \text{IMMIG} - \underset{(1.05)}{.128}\ \text{R1} + \underset{(0.41)}{.003}\ \text{R3} \\ & + \underset{(1.34)}{.142}\ \text{R4} + \underset{(0.89)}{.089}\ \text{R5} + \underset{(0.64)}{.082}\ \text{R6}\end{aligned}$$

(t statistics in ( )).

$\overline{R^2}$ = .249 SE = .536 F = 5.94 N = 314

In our case the inability to adequately estimate market prices of housing and nonhousing goods faced by observed housholds is rooted in the imperfect location information provided by the SCF databases. Our one attempt to include price information is aimed at proxying the price of a minimum housing unit which is critical to our view of the tenure transition process. The NHA financed new house price series should include the basic units of interest. However, it is an average across diverse CMAs of average prices within each CMA. Thus it is arguable that this series is a better measure of basic housing unit prices in high price CMAs than in lower price CMAs, particularly in 1977 when eligibility for NHA financing included a house price ceiling. Although there is no obvious reason to believe that this data imperfection would affect the normalized earnings variable more than the comparably normalized net worth variable, that result is possible.

Consequently, we have further tested the robustness of our reported results in several ways. First, the 1984 SCF provides an additional piece of household location evidence by coding households residing in CMAs of over 500,000 population. This sharply reduces the number of CMAs required for inclusion in a subsample. We reestimated all the specifications reported above. The explanatory power of the equations is somewhat greater, as expected, in each case and net worth strongly dominates the earnings constraint.

Second, the potential bias associated with averaging across CMAs can be alleviated by estimating tenure regressions for each region separately. We have done so using several alternative specifications forms including log transformations of NW and TEP (TE) without using

BHPN. These were estimated for each of the five regions in 1977, the six regions in 1984 and for the subset of CMAs containing over 500,000 persons in 1984 in each of the five regions such CMAs exist (none exist in the Maritimes). Net worth dominates the earnings variables in explaining tenure likelihood although in three cases the contribution of household earnings is more important than in the nationwide equations reported herein.

Finally, we tested to see whether the earnings trigger hypothesis is more strongly confirmed when households with low earnings are excluded; this was done by selecting only households with earnings in excess of $5000. Separately, we estimated each regression specification limiting the sample to households with positive net worth. Each of these sample adjustments only marginally improved the explanatory contribution of the budget constraint cohorts in question.

VI. Conclusions and Implications

In this paper we have developed the conceptual case for believing that current nonhuman wealth plays a prominent, and perhaps the critical role in determining the tenure transition to first time home ownership. Consistency tests of the hypothesis are executed utilizing micro cross section data on Canadian households. The reported results are consistent with the proposition that human capital is limited in its ability to overcome nonhuman capital deficiencies in achieving ownership. On the other hand, the results strongly suggest that strong nonhuman endowments trigger ownership almost independent of returns being realized or realizable (permanent earnings) from human capital.

The results are robust over numerous sample selection and specification alternatives; in particular, there is considerable evidence that the results are not the spurious product of the wealth creating attributes of past ownership.

Data imperfections require caution regarding the results. In particular, measures of differences across markets in basic unit housing prices are inadequate and nonhousing goods prices are omitted altogether. Due to the absence of housing expenditure data for renters we were unable to allow for housing demand/tenure choice simultaneity in the estimation process. The methods employed to reduce current wealth/-past tenure mode endogeneity are imperfect. However, the strength and robustness of the current wealth effect is very impressive and raises questions regarding the appropriateness of the efforts of many analysts to refine expected lifetime wealth estimates at the expense of focussing on current wealth accumulation is in explaining tenure choice. In particular our discussion and empirical results suggest that a satisfactory understanding of the transition to homeownership depends critically upon understanding (i) the savings/investment dynamic for young households (ii) the relative importance of internalized versus externally imposed downpayment requirements and especially (iii) the role of intergenerational wealth transfers in determining housing demand.

Footnotes

[1]Computed from the microdata file prepared by Statistics Canada from the 1984 Survey of Consumer Finances.

[2]Virtually all empirical studies of tenure choice estimate tenure likelihood over samples of households drawn from essentially all life cycle stages. Indeed, the only study which, to our knowledge, estimates determinants of the likelihood of the first transition from rental to ownership is Dhrymes (1983). Henderson and Ioannides (1986) do present the regression results for a subsample of families with household heads aged under 35 as an ad hoc means of identifying decision units constrained by capital market imperfections, but they consider the results to be unenlightening.

[3]Recent examples include Goodman (1986), Dynarski and Sheffrin (1985), Henderson and Ioannides (1986) and Gillingham and Hagemann (1983).

[4]For discussion of these issues see Polinsky (1978), Polinsky and Ellwood (1979), Gillingham and Hagemann (1983), Greenlees and Zieschang (1981) and Smith and Campbell (1978).

[5]Flavin (1981) reaches this conclusion based on nondurable goods consumption and Mankiw (1982) for durable goods consumption.

[6]The real payment tilt literature suggests this phenomenon is exacerbated in periods of high expected inflation, see e.g., Schwab (1983).

[7]This skepticism has been justified by the fact that the primary current wealth variable which has been utilized in tenure likelihood and housing demand equations is equity from prior home ownership, or 'previous tenure' as proxy for realized home equity. See, for example, Smith (1981), Boehm (1981, 1982), Boehm and McKenzie (1981) and Henderson and Ioannides (1985, 1986).

[8]Also of relevance, but unstudied, is the reverse tenure transition from ownership to rental among older households. This reversal appears to have been more pronounced in Canada than in the U.S., perhaps because sale of a principal residence in Canada has been unconditionally free of capital gains tax, whereas tax exemption for U.S. households is subject to ownership rollover or gains cap restrictions.

[9]For a comparison of realized after tax returns to ownership in the U.S. in the 1970's versus the early 1980's see Peiser and Smith (1985). Canadian housing and financial asset markets were subjected to similar macroeconomic impacts during these eras.

[10]Excluded from the sampling universe are residents of the Yukon, Northwest Territories and Indian Reserves and intitutionalized persons. We excluded an extra sampling of high income/wealth family units since many of the relevant data items had been deleted from the data tape by Statistics Canada. We also excluded secondary family units (i.e., those with neither owner or rental status) and we eliminated family units who did not report positive total earnings and positive total assets.

[11]Statistics Canada instituted procedures to substantially improve reporting in the 1977 Survey and these were apparently maintained in the 1984 Survey. See Statistics Canada Catalogue 13-570 (1979) and Statistics Canada, "Evaluation of Data" (1979).

[12]The lower estimated ownership probabilities for 1984 relative to 1977 are, of course, consistent with the view that (perceived) high real interest rates and a disinflation psychology combined to significantly depress expected after tax returns from ownership compared to other available asset mixes.

[13]As reported in Jones (1986), for the 1977 SCF we were able to select a sample of households with heads under 35, for which the owner family units were all recent purchasers (i.e., within the previous 27 months); given their age the bulk of these owners must have been first time purchasers. Current wealth dominated earnings as determinants of tenure mode for this subsample also. Unfortunately the 1984 survey instrument did not collect date of purchase information.

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