The Housing Market Outcomes of Immigrants in Norway

John E Hayfron[*]
Vancouver Centre of Excellence: Immigration (*RIIM*)
8888 University Drive, Burnaby
BC, V5A 1S6 Canada

Abstract

In this paper I use a multinomial logit model to analyze the housing market outcomes of immigrants in Norway. The initial descriptive analysis reveals that a higher proportion of immigrants and Norwegians who were renters in 1980 became homeowners in 1990. The MNL results also provide an evidence of immigrant assimilation in the Norwegian housing market. The decomposition analyses indicate that increasing propensity to own a dwelling explains a greater part of the tilt towards privately owned housing over the decade, while changes in endowment account for the narrowing of the homeownership gap between immigrants and comparable Norwegians over time.

JEL Classification: J1, J15, R21
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Introduction

Following Chiswick's (1978) seminal work, economists have studied income data extensively to estimate the extent to which immigrants' earnings change over time relative to the native-born. Evidence suggests that immigrants experience an initial earnings gap, but this gap narrows with years of residence in the host country (Beggs and Chapman 1988, Bloom et.al 1994, Borjas 1994, and the literature cited therein).

Due to the direct link between the labor market and the housing market, a number of researchers have applied similar techniques to analyze immigrants' housing market performances in some countries. In the U.S., for example, where the bulk of the studies have been done on both the various ethnic groups (Wachter et.al 1992, Krivo 1995, Coulson 1999) and immigrants (Schill et.al 1998, Myers and Lee 1998a, Myers, Megbolugbe, Lee 1998b), evidence suggests that immigrants' homeownership rates converge towards those of the native-born over time. These studies found cohort membership, aging, duration of residence, educational level, choice of location, and immigrant status to be important determinants of homeownership attainment of immigrants in the U.S.

Similarly, empirical studies that have been conducted in countries, such as Australia (Bourasssa 1994), Canada (Ray 1991, Laryea 1999) and Israel (Lewin-Epstein et al. 1997) also indicate among others, a positive correlation between length of stay in the host country and immigrants' homeownership propensity. For example, Bourasssa (1994) found that time spent beyond the age of 15 has a significantly positive effect on immigrants' propensity to own a home in Australia. He concluded that differences in

endowments account for virtually all the differences in homeownership rate between immigrants and the Australian-born in Sydney and Melbourne.

In Norway, the foreign-born population has grown over the past two decades, increasing from 61,806 (or 1.5 percent) in 1975 to 232,200, or (5.3 percent of the total population of 4.4 million) in 1997. Most of these are part of the earlier wave of so called economic immigrants from the developing countries to Europe in the 1980s.[1] Yet little is known about their performances in the Norwegian housing markets. This paper fills the gap by investigating whether the tenure status (renting versus owning) of immigrants changed between 1980 and 1990. It also investigates whether the gap (if any) between immigrants and Norwegians homeownership rates narrows over time. A convergence of immigrants' homeownership rate towards that of Norwegians over time is interpreted as evidence of immigrant assimilation in the Norwegian housing market.

The paper proceeds with a brief discussion of the Norwegian housing market and housing policy. Section III describes the data employed in this study, while section IV is the model specification. Section V reports the results, and section VI decomposes the changes in tenure status into the portion due to differences in endowments over time, and a portion due to the residual. Section VII concludes with a summary of the analysis.

II. The Norwegian Housing Market

The housing market in Norway is currently unregulated. However, the government is an active player in the housing and credit markets. The Norwegian State Housing Bank's interest rates are an integral part of the financial system in the housing

[1].Unlike countries like Australia, Canada and the U.S, Norway has a closed-door immigration policy. For a detailed analysis of the Norwegian immigration policy, see Hayfron (1998b).

market. These interest rates are relatively low compared to those of the commercial banks,[2] and this is one reason why people find the state bank mortgage loans as reasonable alternative to those provided by the private credit institutions. Unlike the private credit institutions, the state housing bank influences the size of the house the individual intends to purchase or build through its mortgage loan requirements. That is, the house should not exceed 140 square metres. The rents in housing cooperatives are controlled to a large degree by the interest rate trend of the Norwegian State Housing Bank (Weekly Bulletin of Statistics no 2, 1999).

Apart from the state bank's home loans, a number of other available measures deserve mention. For example, the Norwegian government gives tax incentives (i.e., tax relief on interest costs) to homebuyers, and housing subsidy (*bostøttet*) to low-income earners in the rental market. At the local level, public funding makes the rents of the municipal or social housing to be relatively low compared to the rents in the private rental sector. Eligibility for social housing depends on one's income (i.e., income tested).[3] On the whole, the re-distributive purposes of the social housing are somewhat achieved since only low-income earners are normally channeled into the social housing.

Norwegian Housing Policies and Immigrant Homeownership

Immigrants have equal access to home loans or mortgages issued by the state lending institutions as the indigenous Norwegians. They also benefit from government's tax incentives to homebuyers as well as housing subsidy to low-income earners. Yet immigrants are less likely to own a house than Norwegians. As is well known, tax

[2] This depends on whether it is a fixed or a floating interest rate. The floating rate is about the same level as that of the commercial banks. As of 1996, the fixed rate (for 1 – 3 years) has a maturity period of 20-30 years and requires a down payment of 30 percent of the total cost of housing. Turner (1999) provides an excellent international comparison of housing finance across countries.

incentives normally benefit high-income earners. This means that tax incentives would not necessarily tip their decision whether or not to remain renters or become homeowners, since most immigrants are in low or middle-income group. This would imply that most immigrants would depend heavily on the social housing. From this analysis, it becomes clear that affordability, which a number studies have found to be theoretically and empirically important in determining homeownership (Haurin 1991, Schill et.al 1998) would be important in the case of Norway. This paper explores this issue further in the analysis.

III. Data and sample selection

Borjas (1985, 1994) (see also Baker and Benjamin 1994, Hayfron 1998) has shown that the use of a cross sectional data to measure immigrants' economic advancement over time would overstate the effects of duration of residence because of the intercohort differences between recent and established immigrants. For this reason, I used data from the 1980 and 1990 censuses. One major advantage with the use of the census data is that, it is possible to trace individual immigrants across the two the census periods. Thus, eliminating the possibility of sample selection bias that might arise as a result of return migration or panel attrition. The data was obtained from the Norwegian Population and Housing Census Databank (*FTDB*). The Census Databank is a 10 percent sample from the 1960, 1970, 1980 and 1990 Population and Housing Censuses linked on an individual level. For the purposes of this study, the whole 9,080 observations on immigrants aged 17-66 in the census databank were used. In addition, a randomly drawn sample of 9,080 Norwegians was used to match the immigrant sample. A person is

[3] In some cases, long years of tenancy can be converted into ownership of the apartment.

classified as an immigrant if that person was born outside Norway, has a non-Norwegian parentage and is living in Norway (St meld no 17).

The data provide a detailed information about households, including ownership/ tenancy, number of rooms, area size, number of occupants. The ownership/ tenancy variable has five categories; single owner or collective ownership, housing co-operatives (Borettslag), tenant, housing in connection with the job, tenancy agreement for a limited period. Individuals can either own an apartment built by the housing co-operatives or build a "conventional" home. In this paper, three dummies are used to indicate (1) Rent, (2) own a Co-op apartment, or (3) own a home (privately owned housing). See appendix for a more detailed description of the data

Descriptive Statistics

Table 1 shows the tenure status of immigrants and Norwegians in 1980 and 1990. The proportion of Norwegian renters dropped from 20 percent to 15.3 percent between 1980 and 1990. Similarly, the proportion of Norwegians in owned Co-op apartments dropped from 17.6 percent to 15.3 percent between 1980 and 1990. However, the proportion of Norwegians owned homes increased from 62.4 percent in 1980 to 72.2 percent in 1990.

Of the immigrant sample, 40.2 percent lived in rented houses, 21 percent owned Co-op apartments, while 38.8 percent owned homes in 1980. In 1990, only 16 percent remained in rented houses, while 21.6 percent owned Co-op apartments. About 62.4 percent lived in privately owned homes. Table 1 shows a similar trend among immigrant cohorts.

Much as the descriptive statistics in Table 1 is informative regarding change in tenure status between 1980 and 1990, it falls short of the factors that explain the change in tenure status over time. In other words, what factors do individual Norwegians and immigrants consider when deciding whether to rent or own a house? The multivariate analysis in the next section attempts to address this question.

IV. Model Specification

The tenure choice decision is modeled as a multinomial logit model.[4]

$$\Pr(H_m = m) = \frac{\exp(X_i^{'}\beta_j)}{\sum_{m=1}^{M}\exp(X_i^{'}\beta_j)}, \qquad \text{for all m } (=1,2,3) \qquad \text{Eq. (1),}$$

where, H = homeownership propensity; X_i = a vector of measured explanatory variables of the ith individual; and β = the vector of unknown regression parameters associated with the explanatory variables (X).The vector X includes measures of permanent and transitory incomes, a set of age dummies, gender, geographical locations, marital status, household size, place of births and year of arrival.

Permanent Income

Since the data report only current income, the permanent and transitory income measures were derived from the human capital method, where current disposable income

[4] The multinomial logit model (MNL) is preferable to the nested logit model for two reasons. First, the independent variables used to estimate the tenure choice function are individual attributes and do not vary by type of ownership. Second, nested logit model, which deals with independence from irrelevant alternatives (IIA) limitation of MNL, is considered to be inefficient in the sense that information is omitted in the estimation of the lower level. Moreover, the amount of calculation needed to pass information between the initial and subsequent estimates is excessive (Daly 1987).

was regressed on human capital and non-human capital variables (Goodman 1988; Myers and Lee 1998; Gyourko and Linneman 1996, Long and Caudill 1992, Cameron 1986, Bourassa 1994). The fitted values are used to proxy permanent income, while the residual, which is the difference between current and permanent income, is used as a proxy for transitory income. Table 3 presents the estimated coefficients. The dependent variable is a Box-Cox transformation of current disposable income with $\lambda = 0.5$. [5]

In general, the results of the estimations support the human capital hypothesis. The human capital theory suggests that the human capital variables (age, age squared, and education) should be positively related to permanent income. The individual coefficients of the remaining variables (e.g., residential locations and gender) also appear to perform as expected for both immigrants and Norwegians.

V. The Estimation Results

Tables 4 and 6 report the results from the multinomial logit model (MNL) of homeownership in Equation (1) for immigrants and Norwegians. Tables 5 and 7 present the derivatives of the estimated coefficients with respect to each variable. The dependent variable for the set of coefficients is the log of odds of owning Co-op apartment versus renting; the second set refers to the log of the odds of owning homes versus renting. The reference category is renting. The interpretation of the MNL coefficients is now well known. That is, an addition of one unit in an explanatory variable reduces (if a negative coefficient) or increases (if a positive coefficient) the likelihood of owning a Co-op apartment or owning a home relative to renting a house.

[5] Disposable income was used in this analysis to capture the effect of tax benefits associated with

Three models were estimated separately for immigrants and Norwegians. Each of them has a different measure of income as one its explanatory variables. Model 1, which is the initial model includes current disposable income as one of the explanatory variables, while Model 2 includes measures of permanent and transitory incomes. Model 3 includes a variant of the permanent income (average income).[6] This was to test the hypothesis that using both permanent and transitory incomes together in the tenure choice equation would predict better than using the current income. A likelihood ratio test indicates a slight improvement of the fit of model 2 over models 1 and 3. For this reason, only model 2 is analyzed in the remainder of the paper. Moreover, I will focus on only the parameter estimates of the model that are statistically significant.

Immigrant sample

The MNL model indicates that an unmarried immigrant who arrived in Norway in 1970-79 is less likely to own a Co-op apartment relative to renting. The negative sign on the permanent income variable is somewhat surprising, but reflects the fact that an increase in permanent income significantly decreases the likelihood of owning a Co-op apartment relative to renting a house. A set of regional dummies was included in the estimates of tenure choice to control for the variation in housing prices across geographical locations. The results show that being a resident of either Greater Oslo or Bergen/Stavanger/Trondheim municipalities increases the likelihood of owning Co-op apartment relative to renting a house. It appears that being from an OECD country

homeownership.

[6] Following Silberman, Yochum and Ihlanfeldt (1982), an alternative measure of permanent income variable was formed by averaging the 1980 and 1990 disposable incomes.

increases the likelihood of owning a Co-op apartment relative to renting a house in 1980, but the likelihood changed in 1990.

Next, consider the likelihood of an immigrant owning a home relative to renting a house. As shown in Table 5, the signs of the marginal effects for the permanent income are consistent with the associated coefficients in the MNL model. For example, an increase in permanent income by NoK.1, 000 increases the probability of owning a home by 7 and 8 percentage points in 1980 and 1990 respectively. Transitory income is not statistically significant. As argued by Goodman (1998) transitory income may not have a significant impact on tenure choice, since it might not cover transaction costs that normally associated with home purchase. However, being a resident of Greater Oslo municipality and being never married or divorced/separated/widow reduces the likelihood of owning a home relative to renting a house.

The results show that originating from either OECD or NOECD country increases the likelihood of owning a home relative to renting a house. As expected, the marginal effects for the household size variable indicate that increasing the number of persons in an immigrant household by one would increase the probability of owning a home relative to renting a house by 10.7 and 6.4 percentage points in 1980 and 1990.

Norwegian sample

Having analyzed the tenure choice function for immigrants, I now turn to the tenure choice of Norwegians. The results in Table 7 suggest a significantly negative relationship between permanent income and the likelihood of owning a Co-op apartment relative to renting a house. This is contrary to a priori expectation. The likelihood of

owning Co-op apartment relative to renting a house increases with age within each age group. Compared to their counterparts in the rest of the country (reference), being a resident of the large municipalities (Greater Oslo or Bergen/Stavanger/Trondheim) increases the likelihood of owning Co-op apartment relative to renting a house. This is to be expected, since most of the housing co-operatives are found in the large cities.

Considering the likelihood of owning a home relative to renting a house, the results show that transitory income and marital status (divorced) reduce the likelihood of owning a home relative to renting a house. Similarly, aging increases the likelihood of owning a home relative to renting a house. Moreover, the marginal effect for household size indicates that an increase in the number of people in a household by one person increases the probability of owning a home relative to renting a house by 10.7 and 6.4 percentage points in 1980 and 1990.

VI. Decomposition Analysis

Both the descriptive and multivariate analyses indicated, as expected, a change in tenure status (i.e., a shift from renter-occupation to owner-occupation) between 1980 and 1990. To assess the contribution of changes in endowments to changes in the tenure status over a decade, the following decomposition equation was used (Yates, 2000).

$$(2) \qquad \bar{P}^{J}_{t+10} - \bar{P}^{J}_{t} = \underbrace{(\bar{P}^{J}_{t+10} - \bar{P}^{J}_{t+10|\bar{X}_t})}_{\textit{Endowment Effect}} + \underbrace{(\bar{P}^{J}_{t+10|\bar{X}_t} - \bar{P}^{J}_{t})}_{\textit{Propensity Effect}}.^{7} \qquad t = 1980;\ j = N, I.$$

[7] Equation 2 can be written as $\bar{P}^{J}_{t+10} - \bar{P}^{J}_{t} = \hat{\beta}_{t+10}(\bar{X}_{t+10} - \bar{X}_{t}) + \bar{X}_{t}(\hat{\beta}_{t+10} - \hat{\beta}_{t})$. This is similar to the well-known Blinder/Oaxaca (1973) decomposition technique, which has been used extensively by social scientists to decompose earnings gap between groups.

Where $\overline{P}_t^J$ is the *j*th group's average probability in year *t*. $\overline{X}_t$ is mean characteristics in year *t*. *N, I* represent Norwegians and immigrants respectively. The first component on the right hand side of Equation (2) shows the portion of the probability gap ($\overline{P}_{t+10}^j - \overline{P}_t^J$), which is due to changes in characteristics over time, i.e., "endowment effects," while the last component is the residual, or "homeownership propensity effect".

The results from the decomposition exercise are reported in Table 8 for Norwegians, immigrants and by period of immigration. Since the objective of this paper is to investigate the source of change in tenure over time, average homeownership probabilities were calculated for each of the tenure choice alternatives (renting, owing a Co-op apartment and owing a home). The figures in column (4) show a negative sign, indicating a decline in the probability of renting and owing co-op apartment, while the positive sign indicates an increase in the probability of owing a home. Column 5 shows the percentage contribution (in brackets) of changes in endowment to changes in tenure status over time. Column 6 shows the residual.

Compare for example, the change in immigrants' probability of renting and the probability of owing a home. In both cases, as noted in Table 8, one sees a much smaller impact of endowment (4.2 percent) on the probability of renting a house. The contribution of endowment is equally to the increase in the probability of owing a home is small effect (7.6 percent). This implies that 95.8 percent of the decline in probability of renting and 92.4 percent of the increase in owing a home is due to some unmeasured factors. These could range from a possible effect of government policies to fluctuations in housing prices etc over the ten-year period. It is worth noting that the current analysis

compares immigrants as well as Norwegians tenure status in 1980 to those of 1990. As shown in Table 9, the rate of change is higher for immigrants than for Norwegians.

The second objective is to measure the progress made by immigrants relative to Norwegians in the Norwegian housing market. The results in Table 10 indicate that the homeownership rates of immigrants are converging rapidly towards those of Norwegians over the decade. Consider, for example, the probability of owing a home. The gap between Norwegians and immigrants homeowners was .306 in 1980. However, the gap dropped by 64 percent to .11 in 1990. Figure 1 provides an additional support for this finding. The results also indicate that 75.4 percent of the decline in the gap can be traced to endowment effects, while 24.6 percent is due to homeownership propensity effects.

VII. Summary and Conclusions

In this paper I use 1980 and 1990 census data to examine the housing market outcomes of immigrants in Norway. First, I investigate whether the tenure status of immigrants changed between 1980 and 1990, and whether the change (if any) is explained by changes in endowment, or due to some unmeasured characteristics. Second, I also investigate whether the homeownership rate of immigrants converges towards that of Norwegians, and the contribution of endowment to the convergence. A multinomial logit model was used, which relates the explanatory variables to the log of owing a Co-op apartment versus renting, and the log of owing a home versus renting.

Both the descriptive and the MNL analyses indicate that both Norwegians and immigrants changed tenure status (i.e., a shift from renting to owing) between 1980 and 1990. Assessing the contribution of to changes in the tenure status over time was, it was

found that endowment effect was relatively small compared to propensity effect. In other words, individuals changed tenure status because of the increasing preferences to own a dwelling.

However, comparing the performances of immigrants with those of Norwegians, it became apparent are catching up with their Norwegian counterparts over time. The analysis indicates that the gap between Norwegian and immigrants dropped from 0.306 in 1980 to 0.011 in 1990. It was also found that changes in endowment over time account for 75 percent of the rapid convergence of Norwegian-immigrant homeownership gap, living 24.6 percent unexplained. This is not surprising since the estimated permanent income gap between Norwegians and immigrants dropped from NoK 1,286.35 in 1980 to NoK 933,31 in 1990.

References

Baker M., Benjamin D. (1994). "The Performance of Immigrants in the Canadian Labor Market." *Journal of Labor Economics* 3(4): 369-405

Beggs JJ. Chapman BJ (1988). Immigrant Wage Adjustment in Australia. Cross Section and Time Series Estimates. *Economic Record* 64,184, 161-167.

Borjas, G. (1985). Assimilation, Changes in Cohort Quality, and Earnings of Immigrants. *Journal of Labor Economics* 3(4): 463-489.

Borjas, G. (1994). The Economics of Immigration. *Journal of Economic Literature* 32(4): 1667-1717.

Bourassa, S. (1994). "Immigration and Housing Tenure Choice in Australia". *Journal of Housing 5, 1,* 117-137.

Cameron, TA. (1986). "Permanent and Transitory Income in Models of Housing Demand. *Journal of Urban Economics* 20, 205-210.

Chiswick, B R (1978). "The Effect of Americanization on the Earnings of Foreign-Born Men. *Journal of Political Economy* 86 (5): 897-921.

Coulson, E. N. (1999). Why Are Hispanic- and Asian-American Owner-occupancy Rates So Low?: Immigration and Other Factors. *Journal of Urban Economics* 45, 209-227.

Daly, A. (1987). "Estimating tree logit models". *Transportation Research B*, 251-267.

Goodman, A.C. and Kawai, M. (1982). "Permanent Income. Hedonic Price and Demand for Housing: New Evidence". *Journal of Urban Economics*. 12, 214-237.

Gyourko, J and Linneman P.(1996). "Analysis of the Changing Influences on Traditional Households'Ownership Patterns". *Journal of Urban Economics* 39,

318-341.

Hayfron, J. (1998a) “The Performance of Immigrants in the Norwegian Labor Market.” *Journal of Population Economics* 11:293-303

Hayfron, J. (1998b) “The Labor Market Experience of Immigrants in Norway.” Ph.D. Dissertation. Economics Department University of Bergen, Bergen, Norway.

Ihlanfeldt, K. and Silberman, J. “Differential Response to Change: The Case of Home Purchase”. *Journal of Urban Economics* 17, 127-144 (1985).

Krivo, L. (19995). “Immigrant characteristics and Hispanic-Anglo housing inequality, *Demography*, 43, 599-616.

Laryea, S. (1999). “Housing Ownership Patterns of Immigrants in Canada.” RIIM Working paper #99-19. 1 -37

Lewin-Epstein, N.Y., Elmelech and M. Semyonov (1997). “Ethnic inequality in homeownership and the value of housing: The case of immigrants in Israel.” *Social Forces* 75, 4, 1439-62.

Myers, D., and Lee S.W. (1998). “Immigrant Trajectories into Homeownership: A Temporal Analysis of Residential Assimilation”. *International Migration Review*, 32, 3, 593-625

Myers, D., Megbolugbe I, and Lee S.W. (1998). “Cohort Estimation of Home Ownership Attainment among Native-born and Immigrant Populations”. *Journal of Housing Research*, 9, 2, 237-268.

Schill, M. H., S. Friedman, E. Rosenbaum (1998). “The Housing Conditions of Immigrants in New York City”. *Journal of Housing Research*, 9, 2, 201-235.

St. meld nr 7 (1996-97). Om innvandring og det flerkulturelle Norge (About immigration

and the multicultural Norway).

Turner, B. (1999). Social Housing Finance in Sweden. *Urban Studies,* Vol. 36, 4, 683-697.

Yates, J. (2000). “Is Australia’s Homeownership Rate Really Stable? An Examination of Change Between 1975 and 1994”. *Urban Studies*, 37, 2.

Wachter S. and I. Megbolugbe (1992). “Racial and ethnic disparities in homeownership. *Housing Policy Debate*, 3,333-370.

Weekly Bulletin of Statistics no 2, 1999. Statistics Norway.

APPENDIX

Description of Data

The census data do not distinguish between male and female household heads, therefore, each is counted as a household head when either or both own or rent a dwelling unit. Similarly, the census data do not report directly years since migration (or year of arrival). However, using the personal identification number in the data, a set of year of arrival dummies for immigrants was created. According to Norwegian law, only individuals who are residents of Norway for at least six months prior to each census, can participate in the population census. For example, immigrants in the pre-1960 cohort reported participation in the 1960 Census. Immigrants in the 1960-69 cohort reported participation in the 1970 Census, while those in the 1970-79 cohort reported participation in the 1980 Census. For Norwegians, only those who participated in all the censuses were included in the analysis, thus reducing the possibility of census attrition.

The 1990 census file reports immigrant's country of birth and current citizenship, while the 1980 file reports only the latter. However, since the same individuals can be identified in both data files, the birthplace variable would apply to immigrants in 1980 file as well. Individuals who reported Norway as the country of birth were categorized as second-generation immigrants.[8]

[8] Statistics Norway usually classify immigrants born in Norway are as immigrants on the basis of their father's nationality.

Table A1

Age Cohort		
Age 17-25	=	Reference category
Age 26-35	=	One, if individual belongs to this age group; otherwise zero
Age 36-45	=	One, if individual belongs to this age group; otherwise zero
Age 46-57	=	One, if individual belongs to this age group; otherwise zero
Age 58-67	=	One, if individual belongs to this age group; otherwise zero
Educational Level		
Elementary School	=	Zero, if 0-10 years of schooling (reference category)
High School	=	One, if 11-12 years of schooling; otherwise zero
College/University	=	One, if 14+ years of schooling; otherwise zero
Income Measures		
Income	=	Disposable income earned in period *t*.
Permanent Income	=	Fitted values
Transitory Income	=	Current income – permanent income
Geographic location		
Oslo	=	One, if resides in Oslo and Akershus Municipality; otherwise zero
Bergen	=	One, if resides in Metropolitan cities Municipalities; otherwise zero
Rest of the country	=	Reference
Marital status		
Never married	=	One, if never married; otherwise zero
Other	=	One, if separated, divorced or widow(er); otherwise zero
Married	=	Zero, if currently married (Reference category)
Gender	=	One, if male; otherwise zero
Self-employed	=	One, if self-employed; otherwise zero
Household size	=	Number of persons in the household
Place of birth		
Nordic	=	One, if place of birth is Denmark,Finland,Sweden; otherwise zero
OECD	=	One, if place of birth is OECD country; otherwise zero
NOECD	=	One, if place of birth is NOECD country; otherwise zero
Second Generation	=	Zero, if place of birth is Norway (Reference category)
Arrival Cohort		
1970-79	=	One, if arrived in Norway in the 1970s; otherwise zero
1960-69	=	One, if arrived in Norway in the 1960s; otherwise zero
Pre-1960	=	Zero, if arrived in Norway before 1960 (Reference category)

Table 1. Distribution of Tenancy/Ownership. 1980-1990

	1980				1990			
		Owner-occupation				Owner-occupation		
	Renter	Co-op	Private	N	Renter	Co-op	Private	N
Norwegians	20.0	17.6	62.4	3753	12.5	15.3	72.2	3753
All immigrants	40.2	21.0	38.8	1360	16.0	21.6	62.4	1360
Year of Arrival in Norway								
1970 – 1979	54.2	18.1	27.7	733	19.0	22.1	58.9	733
1960 – 1969	23.8	23.3	52.8	369	11.1	19.5	69.4	369
Pre -1960	24.0	50.4	25.6	258	14.3	23.3	62.4	258

Source. Author's calculations from the census data.

Table 2. Mean Characteristics

	Immigrant sample		Norwegian sample	
	1980	1990	1980	1990
Permanent Income (Average Income)	51,639.63	51,639.63	51,618.97	51,618.97
Permanent Income (Fitted Values)	47,072.8	50,534.1	48,359.15	51,467.41
Transitory Income (Residual)	-1123.5	6,798.9	-2,948.87	6,360.50
Current Income (After Tax)	45,946.32	57,332.94	45,410.28	57,827.66
Age Cohort				
17-25				
26-35	.361		.311	
36-45	.298	.361	.243	.309
46-57	.181	.298	.247	.224
58-67		.181		.164
Marital status				
Never married	.208	.118	.253	.181
Divorced/Separated/Widow	.064	.151	.053	.117
Married				
Self-employed	.067	.067	.104	.104
Residential location				
Greater Oslo	.398	.406	.201	.198
Bergen/ Stavanger/Trondheim	.118	.107	.149	.148
Rest of the county				
Gender (*Male* = 1)	.604	.604	.622	.544
Household size	3.275	3.156	3.617	3.147
Place of Birth				
Nordic	.101	.101		
OECD	.379	.379		
Non-OECD	.346	.346		
Norway				
Arrival Cohort				
1970-79	.539	.539		
1960-69	.271	.271		
Pre-1960	.190	.190		

Table 3. Permanent Income Regression. (Dependent variable is a Box-Cox transformation of Disposable income with $\lambda = 0.5$.).

	Immigrant sample			Norwegian sample		
	Coefficient	t-statistic	Mean	Coefficient	t-statistic	Mean
Age	13.120	6.111	40.68	13.108	6.837	39.61
Agesq	-.1439	5.970	1774.9	-.1450	6.799	1701.5
Educational level						
Elementary school						
High School	12.354	2.285	.3937	34.435	6.284	.218
College/University	39.834	5.077	.2577	69.007	6.802	.210
Residential Location						
Oslo	18.148	3.525	.4022	34.043	5.727	.200
Bergen/Stavanger/Trondheim	39.052	4.233	.1129	10.206	3.315	.149
Rest of the country						
Gender (Male = 1)	63.635	6.828	.6037	74.896	7.007	.583
Marital Status						
Never married	-6.139	.964	.1629	-8.116	2.686	.217
Separated/Divorced/Widow (er)	7.589	1.112	.1074	34.767	5.852	.085
Currently married						
Self-employed	-55.384	5.123	.0676	-28.927	5.820	.104
Country of origin						
Nordic	17.796	1.796	.1015			
OECD	11.206	1.651	.3794			
NOECD	20.078	2.841	.3456			
Second generation						
Arrival Cohort						
1970-79	4.436	.620	.5390			
1960-69	-5.583	.854	.2713			
Pre-1960						
Constant	84.042	3.019		99.303	7.645	
R-sq.	.476			.490		
Sample size	2720			7506		

Source: Author's calculations based on the 1980 and 1990 Population and Housing censuses of Norway.
*Note***:** The 1990 mean income was converted into 1980 Norwegian kroner by deflating with the consumer price index (CPI), 2.312.

Table 4. Multinomial Logit Model of Housing Tenure Choice. Immigrant sample.

	1980			1990		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Owner Co-op apartment						
Current Income (*After Tax*)	-.00007			-.000005		
	(1.509)			(1.317)		
Permanent Income (*Fitted Values*)		-.0005			.00002	
		(2.559)			(.081)	
Transitory Income (*Residual*)		-.00005			-.000003	
		(1.033)			(.082)	
*Permanent Income (*Average Income)[1]			-.00003			-.000001
			(1.303)			(.053)
Age Cohort [2]						
26-35	.1280	.6042	.0667			
	(.492)	(1.807)	(.261)			
36-45	.5208	1.279	.4258	-.0987	-.3308	-.0312
	(1.836)	(2.903)	(1.541)	(2.768)	(1.025)	(1.140)
46-57	.4185	1.1581	.3008	-.0276	.1751	.2374
	(1.278)	(2.517)	(.939)	(.797)	(.528)	(.809)
58-67				-.0950	-.4920	-.4647
				(2.093)	(1.339)	(1.350)
Marital status [3]						
Never married	-.5934	-.7273	-.6007	.0173	-.5611	-.5686
	(2.567)	(3.038)	(2.598)	(.450)	(1.855)	(1.889)
Divorced/Separated/Widow	-.4040	-.2999	-.4132	.5732	-.6868	-.7026
	(1.297)	(.951)	(1.326)	(1.677)	(2.512)	(2.627)
Self-employed	-.5571	-1.0727	-.5394	-.0893	-.1499	-.1423
	(1.453)	(2.412)	(1.409)	(1.558)	(.267)	(.300)
Residential location [4]						
Greater Oslo	.7672	.9777	.7686	.1959	1.0474	1.0555
	(4.462)	(4.994)	(4.458)	(5.851)	(4.424)	(5.110)
Bergen/ Stavanger/Trondheim	.3634	.7623	.3625	.1393	1.081	1.090
	(1.375)	(2.403)	(1.367)	(3.282)	(2.596)	(3.084)
Gender (*Male* = 1)	.2073	.4041	-.2446	.0510	-.4870	-.4921
	(1.178)	(2.403)	(1.443)	(2.042)	(1.214)	(2.265)
Household size	.1588	.1553	.1586	-.0251	.0317	.0235

	(2.845)	(2.795)	(2.856)	(2.732)	(.432)	(.318)
Country of Birth [5]						
Nordic	.7930	1.061	-.1860	-.2171	-.6614	.0752
	(2.258)	(2.864)	(.613)	(4.028)	(1.495)	(.206)
OECD	.5951	.7927	-.5780	-.2377	-.5930	.1876
	(2.602)	(3.231)	(1.797	(5.658)	(1.985)	(.482)
Non-OECD	.1968	.5246	-.8147	-.2521	-.5054	.6952
	(.883)	(1.982)	(2.315)	(5.947)	(1.533)	(1.665)
Arrival Cohort [6]						
1970-79	-.7654	-.6016	-.7584	-.0610	-.9186	-.9319
	(2.845)	(2.162)	(2.819)	(1.604)	(2.693)	(2.837)
1960-69	.0513	-.0141	.1113	-.0398	-.2623	-.2893
	(.019)	(.053)	(.042)	(1.113)	(.812)	(.902)
Constant	-1.0344	-.1170	-.2333	.1313	1.1746	.6424
	(2.191)	(.186)	(.534)	(2.013)	(1.279)	(1.244)
Privately owned home						
*Permanent Income (*Average Income)[1]			.00002			.00003
			(1.036)			(1.438)
Permanent Income (*Fitted Values*)		.0004			.0005	
		(2.015)			(2.203)	
Transitory Income (*Residual*)		-.00003			.00003	
		(.812)			(1.012)	
Current Income (*After Tax*)	-.00002			.00004		
	(.383)			(1.342)		
Age Cohort [2]						
26-35	.0892	-.2953	.0624			
	(.353)	(.955)	(.250)			
36-45	.6336	.0295	.5970	.3923	.0974	.3733
	(2.334)	(.075)	(2.242)	(1.595)	(.340)	(1.514)
46-57	.8881	.2988	.8688	.4450	.1678	.4125
	(2.932)	(.735)	(2.924)	(1.673)	(.559)	(1.519)
58-67				.1205	.1866	.1706
				(.376)	(.577)	(.560)
Marital status [3]						
Never married	.5811	-.4717	-.5728	-.8218	-.7637	-.8201
	(2.638)	(2.098)	(2.597)	(3.146)	(2.907)	(3.135)
Divorced/Separated/Widow	-.7433	-.8232	-.7497	-1.2876	-1.3971	-1.2922
	(2.506)	(2.754)	(2.530)	(5.574)	(5.873)	(5.588)
Self-employed	.0519	.4864	.0967	.4923	1.017	.5164
	(.187)	(1.415)	(.348)	(1.307)	(2.226)	(1.370)

Residential location [4]						
Greater Oslo	-.4111	-.6040	-.4429	-.2545	-.4679	-.2614
	(2.563)	(3.297)	(2.747)	(1.431)	(2.272)	(1.468)
Bergen/Stavanger/Trondheim	.1096	.4498	-.1586	.2376	.1575	.2238
	(.490)	(1.639)	(.704)	(.770)	(.433)	(.725)
Gender (*Male* = 1)	-.5834	1.0918	-.6460	-.9647	-1.5622	-.9970
	(3.676)	(3.844)	(4.217)	(5.191)	(4.488)	(5.296)
Household size	.4071	.4077	.4022	.2344	.2285	.2332
	(7.696)	(7.706)	(7.603)	(3.480)	(3.392)	(3.452)
Country of Birth [5]						
Nordic	2.1716	1.9478	-.1978	.8890	.6298	.2557
	(5.763)	(4.995)	(.651)	(2.370)	(1.592)	(.818)
OECD	2.1318	1.9593	-.5961	1.1525	.9685	.4974
	(7.401)	(6.571)	(1.852)	(4.422)	(3.526)	(1.491)
Non-OECD	2.0834	1.8025	-.7930	1.3863	1.0614	-.8849
	(7.399)	(5.835)	(2.258)	(5.365)	(3.518)	(2.358)
Arrival Cohort [6]						
1970-79	-.6795	-.8202	-.7654	-.6502	-.8102	-.6221
	(2.855)	(3.321)	(2.845)	(2.285)	(2.749)	(2.199)
1960-69	.0935	.11076	.0514	-.0384	-.0519	-.0805
	(.397)	(.468)	(.019)	(.136)	(.018)	(.029)
Constant	-2.4966	-3.3021	-.4634	.5180	-.7879	1.3614
	(5.140)	(5.346)	(1.148)	(1.017)	(.958)	(2.971)
$-2 * LLR$	443.2	460.6	445.6	351.0	357.9	352.6
L_{max}	-1221.5	-1212.8	-1220.3	-1073.1	-1248.6	-1072.3
Significance level	.0000000	.0000000	.0000000	.0000000	.0000000	.0000000
Prediction rate (percentage)	58.7	59.2	59.3	66.6	66.5	67.0
Sample size	1360	1360	1360	1360	1360	1360

Note: Author's calculations are based on Table 15. The *t*-statistics are in parentheses.

[1] This was calculated by averaging the 1980 and 1990 disposable incomes.

[2] Reference age cohort is 17-25 (26 - 35) for the 1980 (1990) sample respectively

[3] Reference marital status is Married

[4] Reference location is the Rest of the country

[5] Reference country of birth is Norway

[6] Reference arrival cohort is Pre-1960

Table 5. The Marginal Effects. Immigrant sample.

	1980			1990		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Renter						
Current Income *(After Tax)*	.000009			-.000004		
	(1.019)			(1.056)		
Permanent Income (*Fitted Values*)		-.000004			-.00005	
		(.108)			(1.753)	
Transitory Income (*Residual*)		-.000010			-.000003	
		(1.071)			(.787)	
*Permanent Income (*Average Income*)*			.0000001			-.000003
			(.026)			(1.130)
Age Cohort[1]						
26-35	-.0253	-.0141	-.0155			
	(.500)	(.220)	(.312)			
36-45	-.1425	-.1262	-.1282	-.0289	-.0024	-.0273
	(2.508)	(1.497)	(2.315)	(.997)	(.007)	(.937)
46-57	-.1700	-.1543	-.1560	-.0479	-.0209	-.0462
	(2.586)	(1.747)	(2.432)	(1.507)	(.590)	(1.425)
58-67				.0027	-.0043	-.0036
				(.071)	(.114)	(.099)
Marital status[2]						
Never married	.1418	.1387	.1414	.0944	.0886	.0946
	(3.101)	(2.960)	(3.088)	(2.869)	(2.704)	(2.867)
Divorced/Separated/Widow	.1474	.1498	.1493	.1425	.1527	.1437
	(2.348)	(2.357)	(2.376)	(4.383)	(4.517)	(4.400)
Self-employed	.0457	.0305	.0375	-.0424	-.0933	-.0457
	(.691)	(.388)	(.567)	(.920)	(1.654)	(.987)
Residential location[3]						
Greater Oslo	-.0132	-.0411	-.0087	-.0048	.0160	-.0040
	(.390)	(.108)	(.256)	(.227)	(.659)	(.190)
Bergen/ Stavanger/Trondheim	-.0187	-.0636	-.0115	-.0531	-.0146	-.0516
	(.380)	(.107)	(.232)	(1.405)	(.336)	(1.365)
Gender (*Male* = 1)		.1223	.1180	.1053	.1630	.1094
		(1.996)	(3.3438)	(4.037)	(3.514)	(4.110)
Household size	-.0748	.0748	-.0741	-.0233	-.0228	-.0231

	(5.956)	(5.947)	(5.917)	(2.790)	(2.734)	(2.753)
Country of Birth[4]						
Nordic	-.3937	-.3879	.0229	-.0667	-.0421	-.0268
	(5.088)	(4.813)	(.373)	(1.493)	(.903)	(.712)
OECD	-.3637	-.3640	.0703	-.0943	-.0765	-.053
	(6.747)	(6.337)	(1.091)	(2.941)	(2.316)	(1.302)
Non-OECD	-.3237	-.3154	.3916	-.1195	-.0878	.0659
	(6.303)	(5.381)	(5.051)	(3.611)	(2.396)	(1.472)
Arrival Cohort[5]						
1970-79	.1726	.1781	.1754	.0881	.1029	.0858
	(3.145)	(3.139)	(3.188)	(2.446)	(2.735)	(2.398)
1960-69	-.0142	-.0141	-.0152	.0117	.0077	.0088
	(.266)	(.053)	(.286)	(.344)	(.227)	(.260)
Constant	.4643	-.1170	.0901	-.0849	.4319	-.1487
	(4.870)	(.186)	(1.058)	(1.372)	(.445)	(2.521)
Owner Co-op apartment						
Permanent Income (*Average Income*)			-.000007			-.000004
			(1.788)			(1.412)
Permanent Income (*Fitted Values*)		-.0001			-.00006	
		(3.454)			(1.922)	
Transitory Income (*Residual*)		-.000006			-.000004	
		(.760)			(1.060)	
Current Income (*After Tax*)	-.00001			-.000005		
	(1.467)			(1.317)		
Age Cohort [1]						
26-35	.0155	.1313	.0067			
	(.346)	(2.277)	(.154)			
36-45	.0404	.2244	.0266	-.0987	-.0635	-.0955
	(.849)	(2.967)	(.573)	(2.768)	(1.588)	(2.684)
46-57	.0010	.1808	-.0182	-.0276	.0057	-.0157
	(.019)	(2.357)	(.350)	(.797)	(.145)	(.446)
58-67				-.0950	-.0997	-.0934
				(2.093)	(2.184)	(2.183)
Marital status [2]						
Never married	-.0578	-.0902	-.0598	.0173	.0103	.0162
	(1.451)	(2.167)	(1.500)	(.450)	(.267)	(.422)
Divorced/Separated/Widow	-.0105	.0144	-.0117	.0573	.0713	.0553
	(.205)	(.280)	(.229)	(1.677)	(2.019)	(1.621)

Self-employed	-.1039	-.2301	-.1043	-.0893	-.1523	-.0875
	(1.657)	(3.032)	(1.668)	(1.558)	(2.211)	(1.528)
Residential location [3]						
Greater Oslo	.1712	.2229	.1739	.1959	.2211	.1962
	(5.234)	(5.680)	(5.271)	(5.851)	(5.808)	(5.859)
Bergen/Stavanger/Trondheim	.0740	.1720	.0778	.1393	.1869	.1398
	(1.703)	(3.160)	(1.784)	(3.282)	(3.598)	(3.293)
Gender (*Male* = 1)	.0114	.1612	.0098	.0510	.1231	.0504
	(.405)	(2.974)	(.364)	(2.042)	(2.526)	(1.989)
Household size	-.0054	-.0059	-.0050	-.0251	-.0241	-.0259
	(.619)	(.679)	(.570)	(2.732)	(2.633)	(2.801)
Country of Birth [4]						
Nordic	-.0387	.0282	-.0303	-.2171	-.1821	-.0210
	(.689)	(.474)	(.663)	(4.028)	(3.271)	(.495)
OECD	-.0707	-.0202	-.0947	-.2377	-.2145	-.0342
	(1.766)	(.479)	(1.897)	(5.658)	(5.048)	(.760)
Non-OECD	-.1378	-.0549	.0319	-.2377	-.2128	.2196
	(3.370)	(1.204)	(.567)	(5.658)	(4.701)	(4.063)
Arrival Cohort [5]						
1970-79	-.0803	-.0394	-.0772	-.2521	-.0390	-.0648
	(1.950)	(.918)	(1.841)	(5.947)	(.988)	(1.691)
1960-69	-.0068	-.0116	-.0060	-.0612	-.0398	-.0437
	(.175)	(.296)	(.154)	(1.604)	(1.114)	(1.217)
Constant	.0225	.2502	-.0033	-.0398	.2814	-.0734
	(.290)	(2.432)	(.047)	(1.113)	(2.591)	(1.215)
Privately owned home						
Current Income (*After Tax*)	.000002			.000009		
	(.260)			(1.825)		
Permanent Income (*Fitted Values*)		.0001			.0001	
		(3.220)			(2.813)	
Transitory Income (*Residual*)		-.000004			.000007	
		(.434			(1.424)	
Permanent Income *(Average Income)* [1]			.000007			.000008
			(1.744)			(1.959)
Age Cohort [1]						
26-35	.0098	-.1173	.0088			
	(.178)	(1.741)	(.161)			

36-45	.1021	-.0982	.1016	.1276	.0637	.1228
	(1.743)	(1.181)	(1.765)	(2.890)	(1.270)	(2.778)
46-57	.1690	-.0265	.1743	.0755	.0151	.0619
	(2.623)	(.312)	(2.745)	(1.646)	(.296)	(1.328)
58-67				.0924	.1040	.0970
				(1.650)	(1.842)	(1.820)
Marital status [2]						
Never married	-.0840	-.0485	-.0816	-.1117	-.0989	-.1108
	(1.735)	(.990)	(1.684)	(2.334)	(2.060)	(2.313)
Divorced/Separated/Widow	-.1369	-.1642	-.1376	-.1998	-.2240	-.1990
	(2.161)	(2.553)	(4.583)	(4.683)	(5.067)	(4.657)
Self-employed	.0582	.1995	.0668	.1318	.2456	.1332
	(1.025)	(2.760)	(1.178)	(2.046)	(3.135)	(2.067)
Residential location [3]						
Greater Oslo	-.1580	-.2188	-.1652	-.1911	-.2372	-.1922
	(4.441)	(5.152)	(4.583)	(6.008)	(6.370)	(6.027)
Bergen/Stavanger/Trondheim	-.0553	-.1657	-.0664	.0863	-.1723	-.0882
	(1.191)	(2.831)	(1.419)	(1.760)	(2.897)	(1.796)
Gender (*Male* = 1)	-.1166	-.2835	-.1278	-.1564	-.2861	-.1599
	(3.415)	(4.425)	(3.851)	(4.994)	(4.765)	(5.020)
Household size	.0802	.0808	.0791	.0484	.0469	.0490
	(6.226)	(6.250)	(6.159)	(4.069)	(3.946)	(4.096)
Country of Birth [4]						
Nordic	.4323	.3596	.0074	.2838	.2242	.0479
	(4.672)	(3.914)	(.137)	(4.269)	(3.229)	(.914)
OECD	.4396	.3843	.0244	.3320	.2910	.0873
	(5.491)	(4.872)	(.433)	(6.640)	(5.662)	(1.575)
Non-OECD	.4616	.3703	-.4235	.3715	.3006	-.2855
	(5.723)	(4.607)	(4.598)	(7.409)	(5.438)	(4.291)
Arrival Cohort [5]						
1970-79	-.0923	-.1307	-.0982	-.0269	-.0638	-.0210
	(1.950)	(2.757)	(2.066)	(.580)	(1.313)	(.453)
1960-69	.0210	.0265	.0213	.0281	.0321	.0349
	(.468)	(.585)	(.473)	(.629)	(.716)	(.781)
Constant	-.4868	-.7476	-.0869			.2221
	(4.046)	(4.802)	(1.026)			(2.989)
Probability Distribution						
Renter	.411	.413	.411	.144	.144	.145
Owner Co-op apartment	.233	.230	.233	.191	.191	.191

Privately owned home	.357	.356	.356	.664	.665	.664
Sample size	1360	1360	1360	1360	1360	1360

Note: Author's Calculations are based on Table 15. *T-statistics* in parentheses. The Marginal effects of all the variables can be obtained from the author.

Table 6. Multinomial Logit Model of Housing Tenure Choice. Norwegian sample.

	1980			1990		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Owner Co-op apartment						
Current Income *(After Tax)*	-.00002			00006		
	(.582)			(1.892)		
Permanent Income (*Fitted Values*)		-.0002			-.0002	
		(2.343)			(2.423)	
Transitory Income (*Residual*)		.000005			.00009	
		(.126)			(2.863)	
Permanent Income *(Average Income)* [1]			-.000002	.		.00004
			(.121)			(1.679)
Age Cohort[2]						
26-35	.2963	.4881	.2833			
	(1.762)	(2.609)	(1.711)			
36-45	.6902	.9656	.6708	.3321	.4877	.3356
	(3.485)	(4.186)	(3.467)	(1.944)	(2.742)	(1.965)
46-57	.9032	1.1340	.8856	.7355	.8663	.7373
	(4.440)	(5.023)	(4.435)	(3.751)	(5.582)	(3.759)
58-67				.6405	.5147	.6258
				(2.854)	(2.254)	(2.797)
Marital status [3]						
Never married	.0888	.0204	.0961	-.5394	-.6120	-.5386
	(.576)	(.130)	(.625)	(2.917)	(3.276)	(2.916)
Divorced/Separated/Widow(er)	.2894	.4212	.2870	-.3684	-.1437	-.3627
	(1.385)	(1.943)	(1.375)	(1.877)	(.689)	(1.848)
Self-employed	-.6773	-.7941	-.6592	-.1561	-.3767	-.1389

	(2.589)	(2.983)	(2.547)	(.763)	(1.740)	(.679)
Residential location [4]						
Greater Oslo	.9458	1.0862	.9360	1.4344	1.6582	1.4406
	(7.446)	(7.716)	(7.442)	(9.203)	(9.640)	(9.247)
Bergen/Stavanger/Trondheim	.6313	.6843	.6246	1.0375	1.1483	1.036
	(4.197)	(4.494)	(4.160)	(5.545)	(6.011)	(5.535)
Gender (*Male* = 1)	.0083	.3119	-.0155	-.3268	.1997	-.3121
	(.066)	(1.731)	(.135)	(2.399)	(.938)	(2.306)
Household size	.2388	.2324	.2394	.0031	-.002	.0037
	(5.033)	(4.884)	(5.052)	(.049)	(.039)	(.058)
Constant	-1.6330	-1.1596	-1.6897	.6222	.4789	-.6752
	(4.694)	(3.359)	(5.735)	(1.950)	(1.019)	(1.968)
Privately owned home						
Current Income (*After Tax*)	-.00007			.00007		
	(2.264)			(2.725)		
Permanent Income (*Fitted Values*)		-.00005			-.000008	
		(.726)			(.096)	
Transitory Income (*Residual*)		-.00007			.00008	
		(2.284)			(2.938)	
*Permanent Income (*Average Income*)* [1]			.000009			.00006
			(.624)			(2.996)
Age Cohort [2]						
26-35	.2230	.1989	.1610			
	(1.605)	(1.285)	(1.179)			
36-45	1.0255	.9916	.9432	.7724	.8139	.7716
	(6.302)	(5.212)	(5.940)	(5.510)	(5.582)	(5.502)
46-57	1.5245	1.4919	1.4540	1.1362	1.1725	1.1411
	(9.058)	(8.004)	(8.807)	(6.818)	(6.885)	(6.844)
58-67				1.3702	1.3328	1.3597
				(7.270)	(6.984)	(7.238)
Marital status [3]						
Never married	.3166	.3249	.3519	-1.1291	-1.1541	-1.1234
	(2.489)	(2.504)	(2.786)	(7.618)	(7.703)	(7.581)
Divorced/Separated/Widow (er)	-.4057	-.4250	-.4290	-1.2461	-1.1857	-1.2496
	(2.005)	(2.042)	(2.119)	(7.492)	(6.715)	(7.511)
Self-employed	.2791	.2968	.3570	-.2785	-.3408	-.2525
	(1.589)	(1.637)	(2.070)	(1.645)	(1.907)	(1.490
Residential location [4]						
Greater Oslo	-.7754	-.7914	-.8112	-.2923	-.2307	-.2982

	(6.682)	(6.244)	(7.045)	(2.052)	(1.490)	(2.093)
Bergen/Stavanger/Trondheim	-.4092	-.4163	-.4331	.0341	.0698	.0292
	(3.189)	(3.207)	(3.384)	(.209)	(.420)	(.179)
Gender (*Male* = 1)	.0039	-.0281	-.1138	-.1774	-.0332	-.1826
	(.037)	(.188)	(1.192)	(1.541)	(.186)	(1.595)
Household size	.5869	.5859	.5877	.3724	.3680	.3718
	(14.756)	(14.712)	(14.799)	(7.169)	(7.081)	(7.161)
Constant	-1.0640	-1.1170	-1.3536	.2496	.5662	.0932
	(4.694)	(3.868)	(5.606)	(.955)	(1.442)	(.329)
–2 * *LLR*	880.3	889.8	875.2	913.0	925.3	914.9
L_{max}	-3018.4	-3013.6	-3020.9	-2481.0	-2474.8	-2480.0
Significance level	.000000	.000000	.000000	.000000	.000000	.000000
Sample size	3753	3753	3753	3753	3753	3753

Note: Author's Calculations are based on Table 15. *T-statistics* in parentheses.

[1] This was calculated by averaging the 1980 and 1990 disposable incomes.

[2] Reference age cohort is 17-25 (26 - 35) for the 1980 (1990) sample respectively

[3] Reference marital status is Married

[4] Reference location is the Rest of the country

Table 7. The Marginal Effects of the Human and Non-human Capital Variables on Housing Tenure Choice. Norwegian sample.

	1980			1990		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Renter						
Current Income *(After Tax)*	.000009			-.000006		
	(2.030)			(6.615)		
Permanent Income (*Fitted Values*)		.00001			.000003	
		(1.227)			(.490)	
Transitory Income (*Residual*)		.000009			-.000008	
		(1.671)			(2.927)	
Permanent Income *(Average Income)*			.000001			-.000006
			(.496)			(2.803)

Age Cohort[1]						
26-35	-.0350	-.0380	-.0273			
	(1.810)	(1.769)	(1.436)			
36-45	-.1418	-.1464	-.1316	-.0649	-.0701	-.0648
	(5.737)	(5.190)	(5.486)	(4.721)	(4.872)	(4.718)
46-57	-.2073	-.2107	-.1986	-.0986	-.1031	-.0989
	(7.524)	(7.113)	(7.383)	(5.681)	(5.777)	(5.696)
58-67				-.1158	-.1113	-.1147
				(5.881)	(5.659)	(5.860)
Marital status[2]						
Never married	-.0402	-.0392	-.4471	.0955	.0984	.0950
	(2.237)	(2.138)	(2.491)	(6.224)	(6.302)	(6.201)
Divorced/Separated/Widow	.0401	.0385	.0430	.1026	.0951	.1027
	(1.445)	(1.345)	(1.546)	(5.924)	(5.348)	(5.931)
Self-employed	-.0140	.0633	-.0238	.0239	.0315	.0216
	(.545)	(3.505)	(.941)	(1.569)	(1.952)	(1.422)
Residential location[3]						
Greater Oslo	.0655	.0633	.0701	.0048	-.0027	.0052
	(3.968)	(3.505)	(4.260)	(.382)	(.193)	(.412)
Bergen/ Stavanger/Trondheim	.0308	.0301	.0339	-.0158	-.0199	-.0154
	(1.690)	(1.630)	(1.859)	(1.076)	(1.327)	(1.049)
Gender (*Male* = 1)	-.0007	-.0061	.0140	.0181	.0001	.0183
	(.047)	(.295)	(1.037)	(1.748)	(.007)	(1.779)
Household size	-.0767	-.0765	-.0769	-.0293	-.0289	-.0292
	(9.836)	(9.808)	(9.854)	(5.510)	(5.456)	(5.509)
Constant	.1733	.1651	.2096	-.1175	-.0505	.0012
	(5.207)	(3.996)	(5.825)	(.501)	(1.429)	(.048)
Owner Co-op apartment						
Current Income *(After Tax)*	-.0000004			-.0000006		
	(1.077)			(.234)		
Permanent Income (*Fitted Values*)		-.00002			-.00002	
		(2.193)			(2.991)	
Transitory Income (*Residual*)		.000008			.000002	
		(1.913)			(.908)	
Permanent Income *(Average Income)*			-.000001			-.000002
			(.622)			(.799)
Age Cohort [1]						
26-35	.0161	.0431	.0285			

	(.789)	(1.925)	(1.035)			
36-45	-.0154	.0231	-.0094	-.0382	-.0251	-.0378
	(.682)	(.892)	(.425)	(2.5860	(1.666)	(2.558)
46-57	-.0393	-.0070	-.0342	-.0293	-.0185	-.0296
	(1.680)	(.274)	(1.495)	(1.873)	(1.164)	(1.891)
58-67				-.6225	-.0719	-.0628
				(3.351)	(3.773)	(3.387)
Marital status [2]						
Never married	-.0213	-.0308	-.0240	.0500	.0442	.0496
	(1.167)	(1.661)	(1.320)	(3.035)	(2.702)	(3.011)
Divorced/Separated/Widow	.0081	.1001	.0830	.0799	.0980	.0809
	(3.254)	(3.852)	(3.341)	(4.583)	(5.187)	(4.632)
Self-employed	-.1193	-.1174	-.1250	.0098	-.0082	.0092
	(3.773)	(3.742)	(3.976)	(.561)	(.445)	(.524)
Residential location [3]						
Greater Oslo	.2070	.2270	.2094	.1846	.2017	.1858
	(10.364)	(10.252)	(10.464)	(9.775)	(9.677)	(9.804)
Bergen/Stavanger/Trondheim	.1268	.1346	.1284	.1099	.1177	.1101
	(6.749)	(6.991)	(6.821)	(6.365)	(6.624)	(6.374)
Gender (*Male* = 1)	.0007	.0434	.0098	-.0185	.0248	-.0164
	(.049)	(2.149)	(.772)	(1.595)	(1.387)	(1.428)
Household size	-.0296	-.0302	-.0296	-.0356	-.0355	-.0354
	(5.322)	(5.418)	(5.323)	(5.768)	(5.773)	(5.758)
Constant	-.1060	-.0386	-.0833	-.0919	-.0023	-.0826
	(3.197)	(.993)	(2.386)	(3.340)	(.061)	(2.840)
Privately owned home						
Current Income (*After Tax*)	-.00001			.000007		
	(2.342)			(2.121)		
Permanent Income (*Fitted Values*)		.000008			.00002	
		(.645)			(1.961)	
Transitory Income (*Residual*)		-.00002			.000005	
		(2.823)			(1.554)	
Permanent Income (*Average Income*) [1]			.000002			.000007
			(.833)			(2.656)
Age Cohort [1]						
26-35	.0189	-.0051	.0064			
	(.678)	(.167)	(.234)			

36-45	.1573	.1232	.1410	.1031	.0953	.1026
	(5.018)	(3.441)	(4.617)	(5.397)	(4.821)	(5.370)
46-57	.2467	.2177	.2329	.1279	.1215	.1285
	(7.552)	(6.120)	(7.287)	(6.017)	(5.616)	(6.044)
58-67				.1780	.1832	.1775
				(7.244)	(7.357)	(7.238)
Marital status [2]						
Never married	.0616	.0700	.0687	-.1456	-.1427	-.1446
	(2.475)	(2.770)	(2.780)	(6.733)	(6.632)	(6.733)
Divorced/Separated/Widow	-.1211	-.1386	-.1260	-.1825	-.1931	-.1836
	(3.120)	(3.466)	(3.246)	(7.972)	(7.950)	(8.020)
Self-employed	.1333	.1323	.1489	-.0337	-.0234	-.0308
	(3.940)	(3.920)	(4.476)	(1.459)	(.966)	(1.332)
Residential location [3]						
Greater Oslo	-.2725	-.2903	-.2795	-.1894	-.1990	-.1910
	(11.674)	(11.388)	(11.989)	(10.083)	(9.756)	(10.175)
Bergen/Stavanger/Trondheim	-.1576	-.1647	-.1623	-.0941	-.0978	-.0947
	(6.672)	(6.867)	(6.878)	(4.634)	(4.760)	(4.666)
Gender (*Male* = 1)	.00001	-.0372	-.0239	.0005	-.0249	-.0018
	(.000)	(1.344)	(1.345)	(.030)	(1.046)	(.121)
Household size	.1064	.1068	.1065	.0649	.0644	.0647
	(13.952)	(13.993)	(13.987)	(9.049)	(9.015)	(9.027)
Constant	-.0672	-.1265	-.1263	.1037	.0529	.0814
	(1.538)	(2.323)	(2.683)	(3.026)	(1.034)	(2.201)
Probability Distribution						
Renter	.180	.180	.180	.102	.102	.101
Owner Co-op apartment	.158	.158	.158	.125	.124	.125
Privately owned home	.662	.662		.774	.775	.662
Sample size	3753	3753		3753	3753	3753

Note: Author's Calculations are based on Table 15. *T-statistics* in parentheses.

Table 8. Decomposition 1

					Changes in Characteristics		*Changes in Homeownership Propensities*
	$\overline{P}_{1980}$	$\overline{P}_{1990}$	$\overline{P}_{1990} - \overline{P}_{1980}$	=	$(\overline{P}_{1990} - \overline{P}_{1990\|\overline{X}_{1980}})$	+	$(\overline{P}_{1990\|\overline{X}_{1980}} - \overline{P}_{1980})$
Norwegians							
Renter	.1803	.1015	-.0788		.0167 (-21.3%)		-.0955 (121.2%)
Owner Co-op apartment	.1572	.1236	-.0336		.0171 (-50.9%)		-.0507 (150.9%)
Privately owned home	.6624	.7749	.1125		-.0338 (-30.0%)		.1463 (130.0%)
All Immigrants							
Renter	.4135	.1440	-.2695		-.0113 (4.2%)		-.2581 (-95.8%)
Owner Co-op apartment	.2303	.1909	-.0394		-.0122 (31.0%)		-.0273 (-69.0%)
Privately owned home	.3562	.6651	.3089		.0235 (7.6%)		.2854 (92.4%)
Arrival Cohort							
1970-1979							
Renter	.5009	.1955	-.3054		-.0106 (3.7%)		-.2910 (95.3%)
Owner Co-op apartment	.2122	.1822	-.0300		-.0106 (3.5%)		-.0194 (96.5%)
Privately owned home	.2869	.6223	.3354		.0250 (7.4%)		.3105 (92.6%)
1960-1969							
Renter	.3110	.1008	-.2102		-.0086 (4.1%)		-.2015 (95.9%)
Owner Co-op apartment	.2371	.1811	-.0560		-.0127 (22.7%)		-.0433 (77.3%)
Privately owned home	.4519	.7180	.2661		.0213 (8.0%)		.2449 (92.0%)

Note: Author's Calculations are based on Tables 4 and 6.

Table 9. The rate of change in tenure status between 1980 and 1990

			Arrival Cohort	
	Norwegians	Immigrants	1960-1969	1970-1979
Renter	- 43.7%	- 65.2%	- 67.6%	- 61.0%
Owner (Co-op)	- 21.4%	- 17.1%	- 23.6%	- 14.1%
Privately owned home	+ 17.0%	+ 86.7%	+ 58.9%	+ 117.0%

Note. The rate of change in tenure status was calculated as $(\frac{\overline{P}_{1990} - \overline{P}_{1980}}{\overline{P}_{1980}}) \times 100.$

Table 10. Decomposition of changes in the of homeownership probability between immigrants and Norwegians in 1980 and 1990.

	1980					1990				
	$\overline{P}_{NORW}$	$\overline{P}_{IMM}$	$\overline{P}_{NORW} - \overline{P}_{IM}$	Endowment Effect	Propensity Effect	$\overline{P}_{NORW}$	$\overline{P}_{IMM}$	$\overline{P}_{NORW} - \overline{P}_{IM}$	Endowment Effect	Propensity Effect
Renter	.1803	.4135	-.231 (100%)	.095 (- 41.1%)	-.326 (58.9%)	.1015	.1440	-.042 (100%)	-.036 (85.7%)	-.006 (14.3%)
Owner (Co-op)	.1572	.2303	-.072 (100%)	-.123 (171.0%)	.051 (-71.0%)	.1236	.1909	-.067 (100%)	-.047 (70.1%)	-.020 (29.9%)
Owner (Private)	.6624	.3562	.306 (100%)	.029 (9.5%)	.277 (90.5%)	.7749	.6651	.110 (100%)	.083 (75.4%)	.027 (24.6%)

Note. Percentages in bracket.