

Determinants of International Home Ownership Rates

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I. Introduction

The concept of owner-occupation in housing varies around the world. However, the theory of tenure choice in housing economics tends to resist institutional explanations for differences in global homeownership rates. While there is the beginning of a comparative literature on housing tenure, broad explanations of homeownership rates have been elusive. This research seeks to examine the empirical determinants of international homeownership rates and patterns for a large cross section of countries. Ultimately, we seek to evaluate the potential impacts of social, political, legal, cultural and other variables in understanding homeownership as an international phenomenon.

II. Literature on Homeownership

There is a well-established literature which has developed over the past two decades about the economics of tenure choice in the

United States and elsewhere. The typical U.S. approach is to focus on the joint determination of tenure choice and housing demand. In Europe, studies typically emphasize supply considerations, often as a constraint, since housing is held in short supply, consistent with the more active role of the state, in supplying housing provisions to its citizens. In general, however, tenure choice studies in a variety of countries seem remarkably similar with respect to explanatory variables.

In these studies, the individual decision to rent or own is shown to be a function of the relative cost of owning versus renting, household demand for housing services, wealth and other credit constraints, and investment demand. More recently, the literature has begun to address inter-temporal decision-making with respect to mobility and tenure choice (Zorn, 1988 and Kan, 2000) and portfolio decisions (Haurin, 1991). Further extensions attempt to explain differences in the propensity to own across ethnicities (see Coulson, 1998, for a review of this literature) and across regions in the U.S. (Coulson, 2002). Similarly, estimates have been provided by Chen and Wu (1997) for Taiwan, by Bourassa (1995, 2000) for Australia, by Zorn (1988) for Korea, and by Seko (1991) and Maki (1993) for Japan.

While most of the tenure choice literature examines only micro-level behaviour, there is also the beginning of a comparative literature in this field. Variation in homeownership rates across markets is likely to be a function of variation in demand, supply and possibly, the

availability of inputs to the housing sector (land, for example) (Malpezzi, 1989). We hypothesize that an important set of considerations for any cross-sectional study is the number of institutional factors involving social, political, legal and cultural aspects of each society which is likely to influence the demand for homeownership and, perhaps indirectly, the supply of homes available for this form of tenure.

From a descriptive standpoint, Burns and Grebler (1976), Kemeny (1981), Pahl (1984), Gilbert and Varley (1991) and Angel (2000) report that many countries have experienced an increase in homeownership rates since the period directly following World War II. Understanding which countries experienced increases and why remains quite perplexing, however. For example, Scandinavian and German countries demonstrate flat or even declining rates of homeownership over that time period, despite being a subset of the wealthiest nations in the world (Kemeny 1981). Oxley (1981) suggests that homeownership rates in English-speaking countries have both increased and converged towards one another over time, while other industrialized countries exhibited wide variations in homeownership rates.

Like Oxley (1981) most of the earliest cross-sectional studies focused on small groups of countries in order to compare government housing policies, user costs or the characteristics of particular housing market institutions. In almost all of the comparative studies reviewed here, differences in income (GDP) across

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countries have little power in explaining homeownership rates. From these small-sample studies, other explanations of tenure choice across countries include *growth* in household incomes (a positive relationship) (Pahl, 1984), government expenditure relative to GDP (a negative relationship) (Matznetter, 1994; Oxley, 1981; Schmidt, 1989; and Doling, 1997), inflation (a positive relationship) (Doling, 1997), and the level of urbanization (a negative relationship) (Matznetter, 1994).

More recently, Malpezzi (1989) and Angel (2000) employed multivariate analysis with larger samples of countries.¹ Using a sample of 57 countries, Malpezzi (1989) finds that the percentage of population living in urban areas and its square have a significant positive impact on the percentage of households whom rent. In other words, urbanization appears to have a negative impact on homeownership rates. Angel (2000) reports that for a sample of 32 countries, average household size, the availability of housing credit, the level of government expenditures relative to GDP and inflation are all statistically significant, and explain about 40% of the variation in homeownership rates. Other indices created by Angel, such as a measure of the relative cost of ownership, an index on the nature of government policies toward housing and the relative costs of construction and land also have some explanatory power in alternate specifications of the model.

III. Data

In order to assemble information on a large sample of countries, we utilize data on household homeownership rates from the United Nations Center for Human Settlements Statistical Database (1994) and more recent UNCHs data available on their website. For a few countries with very old data, we obtained more recent information from the respective government's website so as to include the country in our sample. Data on tenure is reported infrequently such that the most recent observation for a

country between 1980 and 1999 is used, and we obtain rates for 106 countries.

The rate of homeownership in a given country is defined as the percent of households who own their primary residence. It is acknowledged that property rights associated with ownership, and therefore the exact nature of homeownership, are likely to vary from place to place. We use this measure from UNCHs as a proxy for fee simple ownership in the Anglo-American sense. More recent projects at the United Nations and elsewhere have begun to collect a broader spectrum of measures that include a more precise picture of tenure by also characterizing public versus private renting, informal homeownership, squatting and homelessness.

Using data from the World Bank Development Indicators and other working paper data sets, we assemble macro-level information about the countries for which homeownership data is available. As is customary in studies of economic growth, all independent variables (except for some categorical variables) are averaged over a ten-year period preceding the year in which the homeownership rate is reported so as to avoid potential endogeneity problems.

Summary statistics for the group of 106 countries for which homeownership numbers are available are presented in Table 1. Overall, the average homeownership rate for our sample of 106 countries is 68%. Notice that this number is not weighted by population, but merely is a simple average that equally weights each country. Panels C and D report the countries with the highest and lowest homeownership rates. Cambodia (95%) and Qatar (21.9%) have the highest and lowest rates of homeownership respectively. Chart 1 depicts the distribution of homeownership rates across countries.

We begin our multivariate analysis by investigating variables of interest from prior cross-sectional studies. Table 2 provides a correlation matrix for several of these variables. Note that many independent

variables of interest proxy for overall levels of economic development and are therefore quite highly correlated with one another at this level of aggregation.

IV. Determinants of Homeownership Rates

Multivariate Analysis

The results of OLS regression analysis, using homeownership rates as the dependent variable, are found in Table 3. Of consideration throughout the tenure literature is that homeownership necessitates a bulky financing event, which may preclude some households from entry (Haurin, 1991 and Duca and Rosenthal, 1994). Traditionally, proxies for household wealth like investment income, age and education are used to predict access to homeownership (Goodman, 1988 and Haurin, 1991). Given high correlations between income and education at the aggregate level, we begin with GDP per capita as a general measure of wealth. At first glance, our univariate results in Specification 1 of Table 3 are inconsistent with prior cross sectional studies that income is not statistically significant in explaining homeownership rates, and the fact that the coefficient's sign is negative appears inconsistent with the spirit of the tenure literature.

The relationship between income (GDP per capita) and homeownership rates is more complicated, however. Once we control for other factors, GDP per capita has a positive, although insignificant relationship, with homeownership. The square of GDP per capita demonstrates some explanatory power once other determinants of homeownership have been controlled for, and its negative coefficient suggests that at very high levels of income, national homeownership rates are likely to be lower, all else equal. In other words, the impact of national income per capita on homeownership rates is non-linear. These results may be explained by our earlier observation about the very low

¹ Malpezzi actually investigates rental rates, which are (approximately) 1 minus a country's homeownership rate.

homeownership rates of several wealthy Scandinavian and German countries.

With respect to other determinants of homeownership mentioned in prior studies, we find that the percent of a country's population living in urban areas has a significant and negative relationship with homeownership rates. Also consistent with prior studies, government consumption as a percent of GDP is significantly and negatively related to homeownership rates in specification 4 of Table 3. This measure, as explained by Angel (2000), is intended to capture a "preference for welfare in government policy." (p. 331). We interpret this variable as a proxy which captures the likelihood of the public provision of housing services or rental subsidies that favorably impact the user costs of renting as compared to the user costs of owning. In both univariate and multivariate analysis (not reported in the table), inflation is not statistically related to homeownership rates. Household size, while positively correlated to homeownership rates, is not statistically significant when included with other explanatory variables in regression analysis.

Studies by Hayashi, Ito and Slemrod (1987), Haurin, Hendershott and Ling (1987), Deutsch and Tomann (1995), Maki (1993), Duca and Rosenthal (1994) and Bourassa (1995) suggest that individuals between the ages of 30 and 54 years are most likely to be homeowners. We include in specification 5 a variable for the percentage of a country's population between the ages of 15 and 64 which is available from the World Bank Development Indicators, as a rather crude attempt to capture the impact of demographics on the overall demand for homeownership. Consistent with the tenure literature, we find that the greater the proportion of individuals in this age bracket, the higher the rate of homeownership. To be complete, we also add the percentage of the population under the age of 15 but do not find it to contribute significantly to our understanding of homeownership. We omit the category for the percentage of population over 64 years.

Housing finance around the world varies widely and is far from universally successful (Duebel, 2000 and Fisher and Jaffe, 2003). We include a dummy variable for countries with mandatory contributions to housing investment (Duebel 2000) because this sort of policy clearly makes the choice not to own a home costly. Angel (2000) develops a measure of housing credit which we are unable to do on this scale. The relative size of mortgage markets is data available for a small cross section of countries (see Fisher and Jaffe, 2003), but its use would constrain our sample size here. Clearly, markets with a mandatory finance system have higher homeownership rates, all else equal.

Since our model of the determinants of homeownership rates is one which presumes that markets are in equilibrium, we omit "transition" countries as defined by the World Bank in Specification 7.² The omission of these countries improves the fit of our model and is consistent with the notion that the economies of the omitted countries are indeed atypical in some sense. We should note however that a recent study of Moscow's housing markets by Winterbottom and Struyk (1995) suggests that the demand for housing adjusts quite quickly in the face of social and political change. We suspect that tenure choices will be altered, too.

Of possible concern is that our sample is not random and that our analysis suffers from a missing variable bias. Comparing our sample to an even larger sample of 210 countries available from World Bank sources suggests that our sample, not surprisingly, is heavy in its representation of OECD countries. Our sample is also more heavily comprised of German-speaking countries than the full sample of countries available to us. In our regression analysis described above, we check for the possibility of selectivity bias in our results and do not find any measurable impact on our reported estimates.³

The Next Step

So what is the next step in understanding the variation that remains in homeownership rates? We begin by dividing our sample into groups according to several dimensions of interest. One persistent observation is that wealth is not well correlated with homeownership rates. Oxley (1981) has suggested that historical origins of countries may, in part, determine their citizen's propensity for homeownership. To this point in our investigation we have also ignored any impact of climate or geographic location. Finally, some European sociologists have suggested that populations that are more ethnically diverse demand more homeownership as a means of intentionally segregating themselves from other cultures or backgrounds (see, for example, Adler, 1995). In Table 4 we begin to examine these topics by looking at the mean homeownership rates across sub-samples of our data.

Table 4 presents some average homeownership rates for groups stratified by variables such as legal origins, type of political system, World Bank geographic areas, climate, World Bank income categories and a measure of ethnic diversity, ethno-linguistic fractionalization. We utilize legal origins of a country as a means of differentiating legal institutions that may influence the demand for homeownership. Typically legal systems can be grouped into common (English) law and civil (Continental) law classifications. Within the civil law category, three families of law: German, French or Scandinavian descent, are normally differentiated. A nation's history as a socialist country is also recognized as influencing current legal institutions. The index of ethno-linguistic fractionalization (ELF) was first employed in economics by Mauro (1995) and measures the probability that two individuals from the same country will *not* be from the same ethno-linguistic group. The beauty of this measure is that it is derived from old Soviet data which relied on historic lingual origins

² "Transition" in this sample is synonymous with socialist legal origins with the exception of Cambodia which is not considered a transition country and which therefore is included in Specification 7.

³ Using the two-step procedure of Heckman (1979), we find that a correction factor produced by this process is never significant in our regressions explaining homeownership rates.

in identifying ethnic groups, did not refer to economic, political or national labels. The higher the ELF index value for a country, the more diverse its population. Finally, *tropical* is a categorical variable that is set equal to 1 when the absolute value of a country's latitude is less than 24.

Table 5 reports pairs of sub-samples with average homeownership rates that significantly (at the 10% level or better) differ from each other. Difference of means tests were performed for different legal origins, income levels, climate and ethnolinguistic fractionalization. Several clear distinctions emerge. Countries with German legal origins have lower homeownership rates than other countries. Countries with tropical climates have higher homeownership rates. Homeownership rates are also negatively related to incomes. The most ethnically diverse nations have the highest homeownership rates. Of interest, the most ethnically diverse countries are also the poorest countries. Due to the fact that we are comparing sub-samples in this table with very small sizes, nonparametric tests were also run in order confirm that difference in median tests were consistent with the parametric tests.

Simply entering any of these variables into our previous regression model does not provide additional explanatory power, most likely due to the multicollinearity of our highly aggregated indicators. What we do in Table 6, however is to confirm our conjecture that the square of GDP is prior specifications is in fact capturing a shift in demand among countries with different heritages. We substitute legal origins for GDP per capita and its square in our last specification of the model (British legal origin is the omitted category). Indeed, countries with a German legal origin have significantly lower homeownership rates than other countries, even when holding rates of urbanization, government consumption and other demographics constant. Adding income back to this specification results in a loss of significance for the legal origin dummies and confirms that these indicators may be at least partial substitutes for each other.

Notice that the dummy variable for Socialist legal origins in Specification 8 reported in Table 6 is highly positive and significant. This result is due to the fact that Cambodia is the only remaining Socialist country in the sample after removing the transition countries, and it has an extremely high rate of homeownership at 95.3%. This result should not be generalized. The other results of this specification do not change if we omit the Cambodian observation.

V. Conclusion

In this paper, we investigate an academic puzzle: explaining the determination of homeownership rates throughout the world. Using recent data from a variety of sources, we explore possible explanations for this complex phenomenon. We find several partial factors associated with high and low rates of homeownership but are less successful in providing a single equation model with comprehensive explanatory power of homeownership as a global pattern. We conclude that any explanation of worldwide homeownership rates must be limited from a generalizable proposition to an anecdotal explanation with limited empirical content.

Nevertheless, homeownership rates affect the social fabric of society. As we argue, one cannot understand a homeowner's behavior without evaluating the range of institutions affecting housing markets and consumer choices. The findings suggest that the secret to explaining homeownership rates lies with the effects of the myriad of institutions. There is much work to be done in this area.

Finally, there are numerous implications of differential homeownership rates in countries both geographically near and far to one another. Legal, economic, political, and cultural institutions are what distinguish one society from another. Homeownership rates is one of the more complex, yet telling, indicators of what differentiates states on alternative sides of boundaries.

VI. References

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Table 1 – Summary Statistics

Panel A. Full Sample

Variable	Mean	Minimum	Maximum	N
Homeownership (% of hh)	67.83	21.90	95.30	106
GDP per capita (\$)	7181	210	41732	101
Growth in GDP (annual %)	3.0681	-9.4450	10.4303	99
Urban pop. (%)	55.4447	11.4800	100.0000	106
Urban pop. growth (annual %)	2.6762	-0.8766	11.7505	105
Government consumption (% of GDP)	15.0809	4.1666	30.3176	99
Inflation	110.1123	0.4406	2831	93
Household size	4.0802	2.2000	7.4000	91
Population under 15 (%)	33.1323	16.0750	49.9253	100
Population between 15 and 64 (%)	60.0292	48.8569	72.1836	100
Mandatory Fin.	0.0377	0	0	106

Panel B. Regression Sample

Variable	Mean	Minimum	Maximum	N
Homeownership (% of hh)	68.58	27.00	95.30	95
GDP per capita (\$)	7491	210	41372	95
Growth in GDP (annual %)	2.9681	-9.4450	10.4303	94
Urban pop. (%)	56.1862	11.4800	100.0000	95
Urban pop. growth (annual %)	2.6425	-0.8766	11.7505	95
Government consumption (% of GDP)	14.7763	4.1666	30.3176	95
Inflation	111.7438	0.4406	2831	87
Household size	4.0217	2.2000	7.2000	83
Population under 15 (%)	32.8893	16.0750	49.9253	95
Population between 15 and 64 (%)	60.1447	46.8569	72.1836	95
Mandatory Fin.	0.0421	0	1	95

Panel C. Five highest Homeownership Rates

Country	Homeownership (% of hh)	Year Reported
Cambodia	95.3	1998
Lithuania	93.6	1999
Armenia	90.6	1998
Singapore	90.2	1995
Bulgaria	89.8	1992

Panel D. Five lowest Homeownership Rates

Country	Homeownership (% of hh)	Year Reported
Qatar	21.9	1986
Latvia	27.0	1992
Switzerland	31.3	1990
Czech Republic	38.4	1991
Sweden	39.0	1990

Chart 1
Distribution of International Homeownership Rates

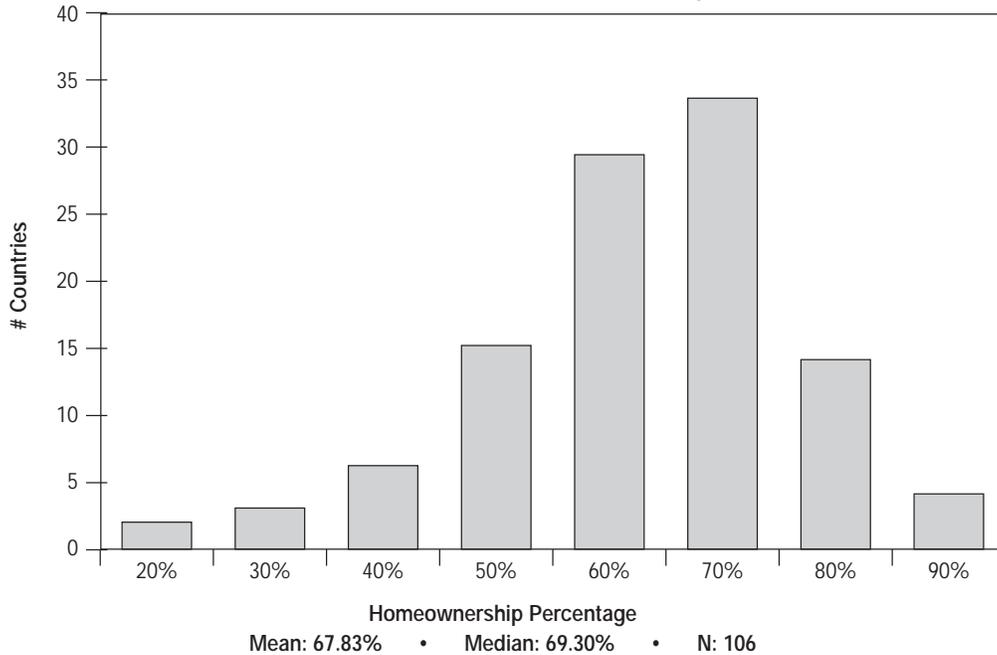


Table 2
Correlation of Regression Variables

	Home-ownership	GDP per capita	GDP Growth	Urban	Urban Growth	Gov't Cons	Infl	HH size	Pop under 15	Pop 15-64	Mand Fin
Home-ownership	1	-0.4542 <.0001	0.0231 0.82	-0.3502 0.00	0.2489 0.02	-0.2130 0.04	0.0006 1.00	0.3963 0.00	-0.2903 0.00	0.1762 0.09	0.2467 0.02
GDP per capita		1	0.0138 0.90	0.6126 <.0001	-0.4667 <.0001	0.2312 0.02	-0.1621 0.13	-0.6139 <.0001	0.7384 <.0001	-0.6466 <.0001	0.0309 0.77
GDP Growth			1	-0.1815 0.08	0.3588 0.00	-0.692 0.51	0.4276 <.0001	0.1928 0.08	-0.1575 0.13	0.0851 0.41	0.2798 0.01
Urban				1	-0.6013 <.0001	0.0679 0.51	-0.0868 0.42	-0.5623 <.0001	0.7160 <.0001	-0.7158 <.0001	0.0311 0.77
Urban Growth					1	-0.0463 0.66	0.0277 0.80	0.6501 <.0001	-0.7670 <.0001	0.7132 <.0001	0.0609 0.56
Gov't Cons						1	-0.0125 0.91	-0.3405 0.00	0.1446 0.16	-0.0593 0.57	0.1485 0.15
Infl							1	0.0930 0.42	-0.1068 0.32	-0.0808 0.46	0.0592 0.59
HH size								1	-0.8239 <.0001	0.6840 <.0001	0.2143 0.05
Pop under 15									1	0.9396 <.0001	0.0435 0.68
Pop 15-64										1	0.0277 0.79
Mand Fin											1

Table 3
Determinants of International Homeownership Rates

The dependent variable is the homeownership rate (x100) of each country in the sample for which data are available. Homeownership rates reflect the percentage of households which own their primary residence, as reported by UNHCS (1994 and 2001) and from other sources. Independent variables are from the World Development Indicators (2002). Mandatory Finance is a categorical variable equal to 1 if a country has a mandatory contribution scheme for housing finance (zero otherwise) and was created from information found in Duebel (2000). Coefficients are reported first and the corresponding t-statistic is listed beneath the coefficient.)

	1	2	3	4	5	6	7
Intercept	73.40654 46.39	72.62507 38.74	78.02137 21.62	84.69204 15.80	-28.35069 -0.59	-12.25845 -0.26	-8.21822 -0.20
GDP per capita (\$1000)	-0.64476 -4.92	-0.33778 -0.82	0.33763 0.60	0.57805 1.00	0.44785 0.76	0.35396 0.61	0.80117 1.30
GDP per capita squared (\$1000)		-0.00001 -0.78	-0.00003 -1.64	-0.00003 -1.94	-0.00003 -1.76	-0.00003 -1.66	-0.00004 -2.48
Percent urban population			-0.14536 -1.74	-0.17152 -2.04	-0.24951 -2.83	-0.23641 -2.72	-0.25072 -3.44
Government consumption (% of GDP)				-0.42371 -1.67	-0.29800 -1.20	-0.23822 -0.96	-0.29496 -1.39
Percent population under 15					0.70071 1.71	0.55494 1.35	0.61740 1.52
Percent population between 15 and 64					1.54610 2.66	1.33028 2.28	1.21851 1.52
Mandatory finance						11.67074 1.96	11.89305 2.96
Adjusted R ²	0.1978	0.1944	0.2119	0.2270	0.2785	0.3011	0.4334
N	95	95	95	95	95	95	84

Table 4
Homeownership Averages by Categories

Category	Mean	Std Dev	N	Category	Mean	Std Dev	N
<i>Panel A – Region</i>				<i>Panel D – Income</i>			
E. ASIA & PAC.	76.26	13.03	14	HIGH, OECD	60.78	12.75	22
E.EUR. & C. ASIA	71.12	20.72	13	HIGH, NON-OECD	58.79	21.90	7
LATIN AM. & CAR.	66.47	8.04	30	UPPER MIDDLE	67.31	12.59	26
MID. EAST & N. AFR	61.75	15.77	13	LOW MIDDLE	69.71	12.56	30
N. AMERICA	64.10	2.40	2	LOW	76.18	11.47	21
S. ASIA	75.50	8.53	3	<i>Panel E – Political System</i>			
SUB SAHARA AFR.	74.17	10.08	15	LIBERAL DEMOC.	65.78	11.44	57
W. EUROPE	58.33	14.12	16	EMERG. DEMOC.	70.72	15.97	30
<i>Panel B – Legal Origins</i>				NAT'L SOCIALIST	62.50	12.91	6
BRITISH	68.61	11.66	34	AUTH. NAT'L	80.40	8.87	3
FRENCH	68.37	11.64	50	MILITARY AUTH.	81.47	5.29	3
GERMAN	52.54	17.12	5	ISLAMIC NAT'L	72.70	-	1
SCANDINAVIAN	58.25	17.14	4	ABSOLUTIST	55.90	26.90	4
SOCIALISTS	72.50	21.74	14	<i>Panel F – Ethnolinguistic Fractionalization</i>			
<i>Panel C – Climate</i>				Low Diversity	63.46	12.48	16
NON-TROPICAL	64.85	15.90	56	Low Middle	65.74	12.36	16
TROPICAL	71.16	10.83	50	Middle	69.26	9.22	16
				High Middle	64.81	11.88	14
				High Diversity	76.27	8.37	14

Table 5
Difference of Means Tests of Average Homeownership Rates

This table presents the statistically significant results of a series of difference of means tests for average homeownership rates by categories. Categories considered here include legal origin, climate, income and ethnolinguistic fractionalization.

Category Pair	T-Statistic (p-value)
<i>Panel A – Legal Origin</i>	
British – German	2.71 (0.01)
French – German	2.78 (0.01)
Socialists – German	2.21 (0.04)
<i>Panel B – Climate</i>	
Tropical – Nontropical	2.41 (0.02)
<i>Panel C – Income</i>	
High OECD – Up Middle	-1.78 (0.08)
High OECD – Low Middle	-2.52 (0.02)
High OECD – Low	-4.15 (0.00)
High Non OECD – Low	-2.01 (0.08)
Up Middle – Low	-2.50 (0.02)
Low Middle – Low	-1.87 (0.07)
<i>Panel D – ELF</i>	
High Diversity – Rest	-2.58 (0.01)

Table 6
Determinants of International Homeownership Rates

The dependent variable is the homeownership rate (x100) of each country in the sample for which data are available. Homeownership rates reflect the percentage of households which own their primary residence, as reported by UNCHS (1994 and 2001) and from other sources. Independent variables are from the World Development Indicators (2002). Mandatory Finance is a categorical variable equal to 1 if a country has a mandatory contribution scheme for housing finance (zero otherwise) and was created from information found in Duebel (2000). Coefficients are reported first and the corresponding t-statistic is listed beneath the coefficient.

	8
Intercept	-47.2533 -1.17
French origin	2.7978 1.17
German origin	-12.1728 -2.47
Scandinavian origin	1.5620 0.27
Socialist origin	17.7455 1.80
Percent urban population	-0.2507 -3.44
Government consumption (% of GDP)	-0.2950 -1.39
Percent population under 15	0.6174 1.52
Percent population between 15 and 64	1.2185 2.52
Mandatory finance	11.8931 2.49
Adjusted R ²	0.4018
N	84