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Housing Prices and Economic Freedom

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Abstract

The Economic Freedom Index of North America measures the impact of governmental institutions. The literature finds that economic freedom leads to higher incomes. Economic freedom is a geographically defined benefit, the value of which will be capitalized into real estate values. We hypothesize that more economic freedom should lead to higher home prices, *ceteris paribus*. Our findings support our hypothesis. Through a variety of direct and indirect effects, economic freedom influences the quality of life. States that are more economically free are more attractive places to live, and the benefits accruing to more economic freedom are capitalized into home prices.

I. Introduction

Higher values of the Economic Freedom Index of North America (Karabegovic, Samida, Schlegel, and McMahon, 2003), an index measuring a constellation of government policies (hereafter the freedom index) has been linked to higher income (Karabegovic, Samida, Schlegel, and McMahon, 2003; Karabegovic and McMahon, 2005), more business venturing and entrepreneurship (Campbell and Rogers, 2007; Kreft and Sobel, 2005), and population in-flow (Ashby, 2007). The freedom index measures the impacts of governmental institutions, which largely stop at a state's borders. Thus a state's policies and institutions consistent with economic freedom constitute a geographical benefit. The value of geographically defined benefits will be capitalized into home prices. We hypothesize that more economic freedom should lead to higher home prices, *ceteris paribus*.

Gwartney and Lawson (2002), Farr, Lord, and Wolfenbarger (1998), Gwartney, Lawson, and Holcombe (1999), Cole (2003), and Powell (2003) emphasize how economic freedom promotes economic prosperity and growth around the world. Kreft (2003), Kreft and Sobel (2005), and Wang (2005) apply the Economic Freedom Index of North America to questions of income, income growth, and entrepreneurship, while Ashby (2007) applies the index to migration patterns. In general, these and other papers find that pro-freedom national/state institutions are causally related to income growth, entrepreneurship, and immigration. Entrepreneurship and migration are associated with economic development (Mora and Davila, 2006; Acs and Storey, 2004). Higher income is associated with lower crime rates and diminished public corruption (Glaeser and Saks, 2006). Growing and increasingly affluent populations will put upward pressure on home prices. In addition to these indirect influences on home prices, people may also value economic freedom intrinsically. Such notional value (as opposed to instrumental value) of freedom is also expected to exert upward pressure on home values.

Using the New Institutional analytical framework (North, 1981; Hayek, 1960), institutional choices lead to economic and social outcomes. Causality runs from institutions and policies to outcomes, rather than the other way around. While governments cannot select a vector of economic shocks, they can select policies; governments can select whether to embrace economic freedom. Thus, economic freedom (institutional choice) yields higher incomes, greater entrepreneurship, lower crime rates, and less corruption, as well as notional value. One way in which residents will capitalize these value streams accruing to a locale's freedom is through housing appreciation.

Accordingly, we estimate models of housing price change. Our primary measure for home price change is the Office of Federal Housing Enterprise Oversight's (OFHEO) House Price Index (HPI). Our findings support our hypothesis; namely, that states with more economic freedom experience greater housing values, *ceteris paribus*. Through a variety of direct and indirect effects, the political policies and institutions summarized in the freedom index influence the quality of life in their respective states. States that are more economically free are more attractive places to live. Stipulating that the supply of housing is not perfectly elastic in the short run, the

benefits accruing to more economic freedom are capitalized into home prices.

II. Literature Review

The literature review is divided into two subsections. The first subsection describes the literature on the freedom indices with an explanation of how the Economic Freedom Index of North America is constructed and how it is used in this study. The second subsection provides an overview of relevant literature on housing prices with an explanation of the index used in this study.

1. Economic Freedom of North America

Freedom indexes of the world have established themselves as fixtures in the social sciences literature, especially in the economic growth literature (see, for example, recent work by Atukeren, 2005; Berggren and Jordahl, 2005; and Gwartney, Lawson and Clark, 2005). Researchers have used these indices or their constituent components as regressors to explain income or income growth rates. At root, this literature concerns the relationship between "institutions" and their impact on observed economic outcomes (e.g., North, 1981). While governments cannot select a vector of economic shocks, they can select policies. Thus, the literature argues that primary causality runs from institutions to policies and then to income, rather than the other way around. Across the literature, this new institutional view has been supported; the consistent finding is that economic freedom, as measured by the various indices, is significantly and positively related to economic well-being. Citizens of nations with more economic freedom enjoy higher incomes, and as an economy becomes freer, incomes rise.

The Karabegovic, Samida, Schlegel, and McMahon (2003) study, "Economic Freedom of North America," presents a conceptually similar index (the "freedom index") featuring economic freedom differences between U.S. states and Canadian provinces rather than the difference between nations. Similar to world freedom indices researchers, Karabegovic et al, argue that economic freedom – proxied by their index – will be positively related to income levels and income growth. They use their index to explain income differences among the states, offering evidence that the freedom index is significantly, positively related to state levels and growth of economic activity.

Karabegovic et al., choose to group ten variables – usually expressed as ratios of GSP – into three categories: size of government, takings and discriminatory taxation, and labor market freedom. For *size of government*, the authors measured general consumption expenditures by government as a percentage of GSP, transfers and subsidies as a percentage of GSP, and Social Security expenditures as a percentage of GSP. For *takings and discriminatory taxation*, the authors measured total government revenue from own source as a percentage of GDP; top marginal income tax rate and the income threshold at which it applies; indirect tax revenue as a percentage of GSP; and sales taxes collected as a percentage of GSP. They rate top personal income tax rates by the income thresholds at which they apply, where higher thresholds result in a lower index value. For *labor market freedom*, the authors measure minimum wage legislation, government employment as a percentage of total state employment, and union density. Karabegovic et al., argue that greater union density has a negative impact on economic freedom and reduces a state's economic freedom index. A number of factors affect union density, notably laws and regulations, size of government employment, and manufacturing density. Government employment is excluded, and the effect of government employment is held constant in calculating the variable. The size of the manufacturing sector has an insignificant effect on union density.[1] Please see Karabegovic, McMahon, and Mitchell (2005) for a discussion of why these variables were included and others excluded.

Karabegovic et al. constructed a scale from 0 to 10 to represent the underlying distribution of the 10 variables in the index, with higher values indicating higher levels of economic freedom. In the final construction each area was equally weighted and each variable within each area was equally weighted. Karabegovic and various co-authors have calculated the index each year based on current values for each of these variables. Each subsequent annual observation creates a new index value for each American state and Canadian province. The freedom index is a relative ranking of economic freedom across provinces and states, respectively, and across time.

[1] One may question whether union density should be an indicator of increased or decreased economic freedom. Karabegovic et al., argue that greater union density has a negative impact on economic freedom, and thus it reduces a state's economic freedom index value. Given that we use their index to measure economic freedom, we implicitly assume that higher union density is inimical to economic freedom.

We use the data set from 1989–2001, inclusive. To demonstrate the range of values, Tables 1a and 1b show a list of the 10 states with the highest economic freedom scores and the ten states with the lowest economic freedom scores for 2001.

Table 1a: Lowest Economic Freedom Scores (2001) Quintile

State	Freedom Index Score
Massachusetts	5.2
North Dakota	5.4
Washington	5.5
Delaware	5.6
Arizona	5.9
Connecticut	5.9
Maryland	6.0
North Carolina	6.1
Vermont	6.1
Virginia	6.2

Table 1b: Highest Economic Freedom Scores (2001) Quintile

State	Freedom Index Score
New Mexico	7.4
Florida	7.7
West Virginia	7.7
Georgia	7.8
Illinois	7.8
Ohio	7.8
Michigan	7.9
Minnesota	7.9
Montana	7.9
Rhode Island	7.9

2. Housing Prices

The value of geographically defined benefits or amenities will be compounded into local real estate values, including home prices. In a series of papers, Brasington and co-authors (Brasington and Haurin, 2006; Brasington, 2002; Brasington, 1999) investigate the relationship between school quality and home values. At root, these papers test Tiebout (1956) migration on the basis of a geographically defined

benefit. For Tiebout's hypothesis to hold true, citizens must be fully informed about prices, tax rates, and government service levels, and they must have the flexibility to choose to live in a region where they can enjoy the highest level of utility. Incomplete information and positive moving costs limit the ability to migrate, making actual empirical testing less likely to find significant results. As applied to the school quality literature, the concept is that families wish to live in an area with high quality schools and are willing to relocate. As long as the supply of housing is not perfectly elastic, families migrating to a high quality region put upward pressure on home values.

Brasington (1999) finds that the housing market values traditional measures of school quality, such as proficiency test scores. Using spatially autocorrelated hedonic housing models, Brasington finds that higher school quality leads to higher home values. Brasington (2002) estimates the price elasticity for public school quality based on the significant and positive relationship between hedonically measured home values and school quality measures. Brasington and Haurin (2006) find a strongly positive relationship between measures of public school quality and housing prices. In a related study, Dee (2000) offers a general investigation into the capitalization of education reforms into housing values. Dee determines that court-mandated changes in school funding trigger a Tiebout response, and increased demand for housing in the affected areas capitalizes the increased educational spending into home values.

To conduct our analysis, we estimate models of housing price change. Our measure of housing price change is the Office of Federal Housing Enterprise Oversight's (OFHEO) Housing Price Index (HPI) (http://www.ofheo.gov/hpi.aspx). The HPI is a measure designed to capture changes in the value of single-family homes, and is a broad measure of the movement of single-family house prices. Each quarter, Fannie Mae and Freddie Mac provide the OFHEO with information on their most recent mortgage transactions. The OFHEO combines these data with the data of the previous 29 years to establish price differentials on properties where more than one mortgage transaction has occurred. The data are merged, creating an updated historical database that is then used to estimate the HPI. The methodology used by OFHEO in computing the Index is a modified version of the Case-Shiller geometric weighted repeat sales procedure. Tables 2a and 2b show a list of the 10 states with the highest housing price scores and the ten states with the lowest

housing price scores, respectively. Tables 3a and 3b combine this information to present raw data in graphic form for the top ten and the bottom ten economic freedom states with their respective housing price scores.

III. Empirical Results

To test our hypothesis that economic freedom leads to greater housing wealth, we compile a panel data set of the U.S. states covering 1989 through 2001. Aside from the freedom index, all other data come from government sources, including the OFHEO, the

Table 2a: Lowest Housing Price Index (2001) Quintile

State	HPI Value
Oklahoma	159.23
Wyoming	165.27
West Virginia	171.2
Louisiana	172.99
North Dakota	176.08
Texas	176.1
Alaska	178.16
Mississippi	192.06
Arkansas	193.66
Kansas	196.02

Table 2b: Highest Housing Price Index (2001) Quintile

State	HPI Value
Delaware	297.36
Colorado	301.84
Connecticut	303.99
California	314.19
New Jersey	326.65
Maine	326.85
New Hampshire	330.55
Rhode Island	335.24
New York	396.29
Massachusetts	491.74

Census, the Bureau of Economic Analysis, and the Federal Deposit Insurance Corporation. Because of the nature of our data set and our argument that the impacts of a state government stop at the state's geographic borders, we estimate fixed effects models. In our estimates, all observations are corrected for heteroskedasticity and within-state serial correlation. Furthermore, all of our estimates include year effects as well, as dummy variables for each year except 1989. In practical terms, this means we estimate a time-invariant

Table 3a: Housing Price Scores for the States with the Ten Highest Economic Freedom Scores for 2001

State	Free. Indx.	HPI
Vermont	7.5	275.36
Virginia	7.3	260.41
Pennsylvania	7.3	263.14
Rhode Island	7.3	335.24
West Virginia	7.2	171.2
South Carolina	7.2	236.98
Wisconsin	7.2	244.3
Utah	7.2	249.91
Texas	7.1	176.1
Tennessee	7.1	231.98

Table 3b: Housing Price Scores for the States with the Ten Lowest Economic Freedom Scores for 2001

State	Freedom	HPI
Michigan	5.7	277.36
Maine	5.7	326.85
Louisiana	5.6	172.99
Minnesota	5.6	262.92
Maryland	5.6	268.59
Kentucky	5.5	230.2
Mississippi	5.4	192.06
Iowa	5.4	203.36
Indiana	5.4	221.12
Kansas	5.1	196.02

adjustment to the intercept term for each state. We also estimate an "ordinary" coefficient for each year to capture state-invariant time effects. Table 4 offers descriptive statistics of our final data set, while Table 5 offers correlation coefficients. We estimate a model of the form:

$$\text{Change in Home Prices}_{it} = f(\text{Economic Freedom}_{it}, \text{State Characteristics}_{it}, \text{Year Effect Dummies}),$$

for all states i and years t.

Table 4: Descriptive Statistics

Variable	Description	Mean	Std.Dev.	Minimum	Maximum	Cases
HPI	Housing price index	192.36	53.02	85.10	491.74	650
Ln HPI	Nat. log of housing price index	5.22	0.27	4.44	6.20	650
Freedom	Economic freedom index	6.67	0.54	5.20	8.40	650
Ln Free	Nat. log of freedom index	1.89	0.08	1.65	2.13	650
Ln Income	Nat .log of income per capita	5.12	0.72	4.63	10.26	650
LnMedAge	Nat. log of state median age	3.53	0.06	3.27	3.67	650
Ln PopDen	Nat. log of population density	4.24	1.36	-0.19	6.88	650
Ln House	Nat. log of housing authorizations	9.64	1.16	6.32	12.38	650

Besides the freedom index and the HPI, we observe state income per capita, the state's median age, state population density, and the number of contemporaneous new, privately-owned housing units authorized. We argue that these variables have relatively intuitive reasons for belonging in estimates of home values. Furthermore, they allow parsimonious estimation of a much wider variety of influences affecting home prices. Assuming housing is a normal good, higher per capita incomes should lead to upward pressure on home prices.

Median age captures some of the population dynamics in a region. For example, older median populations could indicate the immigration of retirees into a state, which would cause home values to rise. Population density is another demand-side factor. Higher densities indicate more crowding in a state, which should place a premium on real property. Contemporaneous housing authorizations is a supply-side variable. Assuming that contractors will not build housing without the expectation of selling the units at a profit, we expect that housing authorizations reflects a strong market, and will be positively associated with home prices as housing supply adjusts to housing demand.

Table 5: Correlation Coefficients

	HPI	Ln HPI	Freedom	Ln Free	Ln Income	Ln MedAge	Ln PopDen	Ln House
HPI	1							
Ln HPI	0.98	1						
Freedom	0.04	0.03	1					
Ln Free	0.04	0.03	1.00	1				
LnIncome	0.09	0.09	0.14	0.15	1			
LnMedAge	0.28	0.31	-0.27	-0.28	0.06	1		
Ln PopDen	0.54	0.54	0.20	0.20	-0.03	0.26	1	
Ln House	0.19	0.24	0.33	0.35	-0.02	0.09	0.48	1

A reasonable question is whether population density and housing authorizations are functionally related. Higher population densities may signify "pent up" demand for housing. Assuming the supply of housing is not perfectly elastic, housing authorizations (new construction) would be positively related to or perhaps dependent on population density. If these variables are functionally related in our data set, using both in the same regression model may introduce multicollinearity into our estimates. Multicollinearity would bias our estimated coefficients. The correlation between housing authorizations and population density is 0.48, warranting further investigation into the possibility of multicollinearity. We conclude, however, that multicollinearity concerns are misplaced. Including or omitting population density from our models has very little effect on either the coefficients or standard errors of our other regressors, and

both housing authorizations and population density are separately significant, with believable coefficient sizes. Thus, our final model is:

$$HPI_{it} = \beta_0 + \beta_1 Freedom_i + \beta_2 Income\ per\ capita_{it} + \beta_3 State\ Median\ Age_i + \beta_4 Population\ Density_{it} + \beta_5 Housing\ authorizations_{it} + \upsilon_i + \mu_{it}$$

We present estimates in Table 6. We obtain good fits with the data, with R-squared figures above 0.85, and F-statistics above 70. The cross-sectional (fixed) effects are jointly significant, as are the time effects. Likelihood ratio tests and F-tests indicate that the vector of non-state, non-year regressors significantly increases model fit. Furthermore, a Hausman test overwhelmingly validates our choice of fixed effects modeling instead of random effects modeling.

All theoretically interesting variables have the expected sign, although median age and population density are generally insignificant. The coefficient for income is positive and significant. As per capita income increases, housing values appreciate, consistent with the argument that homes are a normal good. The coefficient for housing authorizations is positive and significant as hypothesized, indicating a robust housing market in which builders respond to a strong demand by beginning to build more homes. That is, where one finds more new homes slated for construction, one contemporaneously finds appreciating home values.

We now turn to the freedom index result. In Table 6, we investigate freedom's effect on home prices from several different angles. In Model 1, we relate the HPI to the natural log of freedom. Given that the HPI is measured as percentage changes in housing values, Model 1's coefficients are best interpreted as elasticities. In Model 2, we relate the level of the freedom index to housing price changes. In Model 3, we include both the level of the freedom index and the change in the freedom index. As hypothesized, the coefficient for the freedom index is positive and strongly significant. Even after accounting for population dynamics, such as growing metropolitan areas (population density) and retiree influx (median age), and after accounting for expanding state economies (income per capita), institutions matter, *ceteris paribus*; an increase in economic freedom leads to an increase in housing values. Because the scale of the freedom index is arbitrary, the size of the coefficient is arbitrary. We cannot meaningfully determine the relative magnitude of freedom's impact compared to impact of the other variables.

Table 6: Housing Price Index and Freedom Index Estimate

Dep. Var.: Housing Price Index					
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
LnFreedom	194.51***				
	4.41				
Freedom		29.88***	35.86***		
		4.38	*5.65*		
ChngeFree			3.93		
			0.99		
Area 1				-42.66***	-43.39**
				-2.34	*-2.43*
Area 2				-9.57	
				-1.08	
Area 3				-20.88*	-24.17**
				-1.83	*-2.33*
Interact 1/2				1.16	
				1.48	
Interact 1/3				18.56**	22.37**
				2.14	*2.44*
Interact 2/3				0.10	
				0.08	
LnIncome	159.81***	160.16**	167.11*	216.12***	216.31***
	2.32	*2.32*	*1.99*	*2.92*	*2.92*
LnMedAge	13.65	12.8	14.61	7.66	5.28
	1.26	*1.18*	*1.49*	*0.47*	*0.31*
LnPopDen.	28.54	28.17	37.24	76.67	75.45
	0.72	*0.72*	*0.86*	*1.5*	*1.5*
LnHousing	17.35***	17.28***	15.23**	17.22***	17.137***
	3.01	*2.99*	*2.14*	*2.91*	*2.89*
Constant	-1356***	-1184***	-1290***	-1247***	-1262***
	-3.88	*-3.33*	*-3.18*	*-2.97*	*-3.03*
R-squared	0.87	0.87	0.87	0.86	0.86
F-statistic	72.56	72.76	74.02	75.64	70.27

Model estimated with cross-sectional and year effects. t-statistics are in italics.
* Significant at 90 percent ** Significant at 95 percent *** Significant at 99 percent

We find that states with more economic freedom, as measured by the freedom index, experience more rapid housing value appreciation, *ceteris paribus*. Through a variety of direct and indirect effects, the political policies and institutions leading to economic freedom influence the quality of life in their respective states. States that are more economically free are more attractive places to live. Stipulating that impacts of a state government stop at the state's geographic borders, a state's policies and institutions consistent with economic freedom constitute a geographically defined, non-tradable benefit. The value of geographically defined benefits or amenities is capitalized into local home prices, as measured by the housing price index.

In Model 4 and Model 5 we decompose the index into its three components and their interaction terms. The freedom index is calculated as the evenly weighted product of the three "areas" of measurement. Thus, the index implicitly measures the effects of each area and their interactions. Therefore, estimates using a decomposition of the index should also include the interaction terms. The "takings and discriminatory taxation" element (Area 2), and its interactions with the other areas, is insignificant in predicting the housing price index. States whose governments spend and transfer greater portions of gross state product (Area 1) experience more rapid home value appreciation. We found this result surprising. However, we can rationalize the result by arguing that more government expenditure, *ceteris paribus*, means more governmental services within a state. So long as people value governmental services, this value is capitalized into home prices. States with more government employment (Area 3) likewise experience more rapid home value appreciation, *ceteris paribus*. Again, we did not expect this result. We hypothesize that government jobs tend to be stable jobs, a valuable attribute that may be capitalized into home prices. However, in the construction of the freedom index, *ceteris* is not at all *paribus*. The freedom index jointly measures government size, taxation, and labor market liberalization. We find that states with smaller governments *and* liberalized labor markets with less government employment experience more rapid housing value appreciation.

One cannot use the housing price index to determine the "price" of a state's housing. However, the housing price index can be used to calculate housing price appreciation within a state. Thus, according to Model 2, a one percent increase in a state's economic freedom index

value – approximately 0.07 points, less than the year 2000 differences between North Carolina and Georgia or between Michigan and Maine – leads to nearly a 30 "point" increase in HPI, from 192 to 222, an appreciation of 0.16 of one percent of the "average" home's value, *ceteris paribus*. According to the National Association of Realtors, the average home price in 2000 was $139,000. Accordingly, a one percent increase in the economic freedom index in a state would yield (approximately) $217 of home value appreciation.

IV. Conclusion

In this study, we hypothesized that more economic freedom should lead to higher home prices, *ceteris paribus*. To our knowledge, this study represents the first attempt to consider the relationship between these two variables. We extend the growing Economic Freedom Index of North America (Karabegovic, Samida, Schlegel, and McMahon, 2003) literature to consider economic freedom's effect on housing prices. Our findings support our hypothesis; namely, states with more economic freedom experience greater housing values, *ceteris paribus*. At the state level, the mix of government policies captured by the freedom index influence the quality of life in their respective states. States that are more economically free are more attractive places to live. As economic freedom increases, housing appreciation occurs.

For state public policy officials, the results of this study (as well as the other studies using the Economic Freedom Index of North America (Karabegovic, Samida, Schlegel, and McMahon, 2003)) are rather clear. Government policies can create either a favorable or an unfavorable climate for builders, buyers and sellers in the housing market. The policies that attract entrepreneurs, additional population, and serve to increase incomes also tend to increase the value of what is for most households their largest asset.

Many practical econometric difficulties can arise in sorting out causality among economic freedom and its correlates: Do more free locales attract immigrants, spur increases in wealth and declines in crime and corruption, or do locales with rising population and income and declining crime and corruption adopt more economic freedom? After adopting the New Institutional analytical framework (North, 1981; Hayek, 1960), however, the direction of causality is plain, flowing from institutional choices to economic and social outcomes: Economic growth and development is the outcome of

market and other economic shocks and government institutions and policy. While governments cannot select a vector of economic shocks, they can select policies; governments can select whether to embrace economic freedom. Several studies (Knack and Keefer, 1995; Mauro, 1995; Hall and Jones, 1999; Rodrik, 1999; Goldsmith, 1999; and Ali, 2003) show that the primary causality runs from institutions and policies to outcomes, rather than the other way around. With this paper, we establish that one way in which residents capture the concrete benefits of pro-freedom institutions is through asset appreciation of the housing stock.

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