

THE IMPACT OF LENDING ACTIVITY AND MONETARY POLICY IN THE IRISH HOUSING MARKET

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Irish banks and consumers currently face both a global credit crunch and a very weak Irish property market. Although the bursting of the property bubble is not the cause of the current financial crisis, it has accentuated its effects in Ireland. In this essay, Conor Sullivan examines the role that bank lending and monetary policy played in driving house prices up over the past twenty years. His conclusion, that lending activity played a significant role, serves to highlight the need for proper regulation and oversight in the banking sector in the future.

Introduction

In the period 1987-2007 real Irish house prices tripled in value, and have since fallen by 10%.¹ This volatility in house prices is a subject of great concern, as it is now clear that the rise was due to a speculative bubble that drove prices beyond their true value, and that the subsequent fall is generating negative repercussions for the Irish economy. This study seeks to analyse the rise in Irish house prices with respect to two related factors: the activity of financial institutions and prevailing monetary policy. It evaluates their impact on prices, and draws conclusions for regulatory and monetary policy. The following section reviews recent developments in the Irish market and theoretical models of housing markets. Section two presents the data, model specification, and empirical approach and section three then discusses and analyses the results. The final section suggests extensions to the analysis and discusses the policy implications of the model presented.

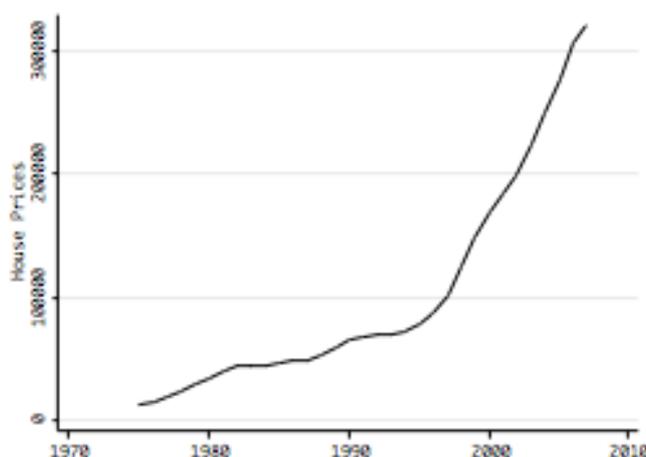


Figure 1: price of new houses in Ireland, 1975-2007 (priced in euro)
Source: Department of the Environment.

¹ Permanent TSB/ESRI House Price Index, 2009

Housing Markets

For much of the last two decades Irish house prices appeared to be on an inexorable upward trend, at some points growing by as much as 28% year on year, and showing quarterly increases 80% of the time between 1975 and 2008 (see Figure 1). Prices peaked in February 2007, remained stagnant for the rest of that year and then began to fall through 2008, with prices in January 2009 having fallen by 1.4% month-on-month and 9.8% year-on-year. This paper seeks to explain the enormous appreciation in the Irish housing market using annual time series for 1975-2008, and, in particular, to explore the impact of monetary policy and lending activity by financial institutions on this rise.

House prices are an important economic variable both in general and in an Irish context. A house is an essential asset, and possibly the single biggest one most people will ever own. Therefore, housing affordability is important from a welfare perspective. At the same time, since housing is such an important good, and because its value typically exceeds disposable income by large multiples, mortgage lending represents a large part of the aggregate portfolio of many financial intermediaries. As such, house prices are important when assessing their profitability and the soundness of these institutions (Tsatsaronis and Zhu, 2004). Thirdly, changes in the price of housing can have large wealth effects and this influences consumption in the economy. This arises from traditional life-cycle theory, which states that present consumption is determined by future income. Intuitively, people 'feel' richer if their house is worth more, and so their consumption is higher.

An important consideration for the way in which the wealth effect exerts itself on consumption is the 'credit channel'. Liberal credit markets mean that higher house prices do not depress consumption amongst those purchasing a house, as the need to save for a deposit is not as great and collateral constraints on owners are relaxed (Muellbauer and Murphy, 2008). This was certainly the case in Ireland and it can therefore be said that house prices have a positive impact on consumption.

Theoretical models of house prices are based on several inefficiencies that create the potential for volatility. Prices are typically modelled as the sum of a fundamental and non-fundamental component:

$$hp = hpf + hpnf$$

There are several factors that cause house prices to deviate from their 'true' or fundamental value. The determinants of the fundamental value of housing are the present value of all future housing services provided to the owner, which can be approximated by rental rates in a market, along with various structural factors such as fiscal provisions or population growth (Crainer and Wei, 2004). If the housing market was efficient, that is to say if the above equation did not hold, then a price higher than that implied by the fundamental value would be indicative of excess demand; this would encourage more housing to be supplied and prices would fall again to their fundamental level. However there are forces in a market that cause inefficiencies to develop. Speculation and asset-price bubbles could be considered one example, where

houses are used as investment vehicles in order to accumulate capital gains; price increases have a positive impact on demand in this scenario.

Since supply is very inelastic in the short run, changes in demand can have a large influence on price. And since purchase is usually considerably leveraged, prices are dependent on liquid credit markets, and on interest rates which move cyclically. This causes inefficiencies in the market pricing mechanism (CBFSAI Financial Stability Report, 2004). It is fairly clear now that Ireland saw a deviation of house prices from their fundamental value, and that what is presently occurring in the market is a correction of that. At least three sources of pricing inefficiencies could be observed in the Irish market; large persistent price rises, supply constraints and cyclically low interest rates were all present to some extent and empirical evidence of this was found as far back as 2000 (Roche, 2001).

Our membership of the Eurozone has caused concern over the appropriateness of the ECB interest rate for the Irish economy. Essentially the question is whether interest rates set for the wider Eurozone (in which Ireland is a small player) are suitable here. In particular, Eurozone interest rates were set very low at a time when the Irish economy was experiencing high levels of economic growth and inflation. Another concern that relates to Irish policy is the extent of mortgage lending, which increased dramatically in real terms in the last fifteen years. This both reflects loose regulatory controls and an increased willingness to expand credit by financial institutions. The model estimated here is an attempt to determine the influence of both these factors on house prices in Ireland, and their deviation from their fundamental value.

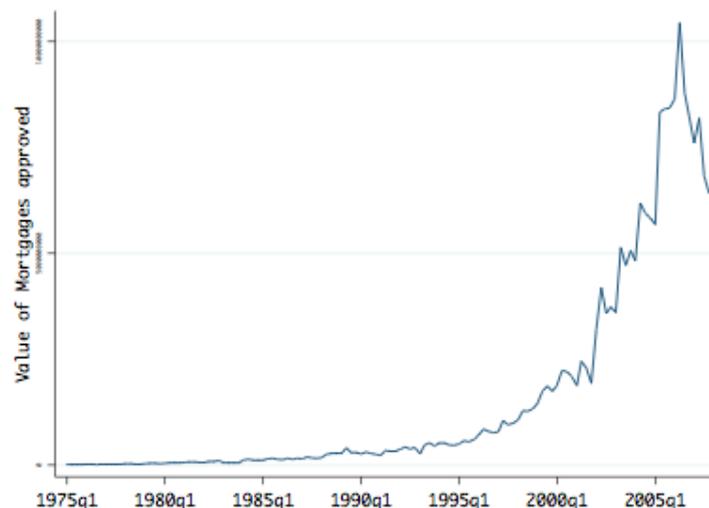


Figure 2: Value of mortgage lending by Irish banks and building societies, priced in euro and adjusted for inflation. Source: Department of the Environment.

Empirical Approach

The relationship was specified using a regression equation, which was then estimated using Ordinary Least Squares. An inverted demand function specification was chosen,

with house prices as the dependent variable. This was regressed on: population, GNP, housing stock, mortgage lending, interest rates and inflation. This specification draws on that used by the ESRI in their HERMES macroeconomic model of the Irish economy.² Regressors measuring mortgage lending and interest rates were included in the model in order to determine the significance, if any, of their influence (as explained in the preceding section).

Population was included as the number of individuals in an economy is a determinant of the demand for housing, and can be expected to have a positive correlation with house prices. Incomes are equally expected to have a positive correlation and GNP is thus included. Supply constraints are modelled using data for annual house completions, and are expected to correlate negatively. Data for the total value of mortgage lending in the economy were used to measure lending, and interest rate effects were estimated using statistics for the average mortgage rate of interest for banks and building societies. The Consumer Price Index was included to control for the effects of inflation.

Preliminary plots of variables suggested the presence of a unit root. A Dickey-Fuller test was performed on the independent variable and failed to reject the null of a unit root at the 1% level. The specification was altered into first-difference form and the model became:

$$\Delta hp = \beta_0 + \beta_1 \Delta pop_{t-2} + \beta_2 \Delta gnp + \beta_3 \Delta mort_val + \beta_4 \Delta rate_{t-4} + \beta_5 \Delta comp + u_t$$

The test was repeated and this time did reject the null of a unit root. The specification was examined at different lags since it can be expected that prices may be slow to adjust. Policy lags with respect to interest rate changes, for example, are well documented and were incorporated into the model above. Population was also lagged by two periods as this produced a significant result and lagged effects of population increases are to be expected. Since quarterly data were used, dummy variables were at first incorporated to detect seasonal effects in price changes. They were highly insignificant however, most likely since house completions showed clear seasonal variation (house construction activity was much lower in winter).

² This model is used in the ESRI Medium Term Review, 2008-2015, p.168.

Variable	Dickey Fuller statistic	1% Critical Level	5% Critical Level
hp	4.29	-3.58	-2.57
Δhp	-11.08	-3.50	-2.88

Variable	Observations	Mean	Standard Deviation	Min	Max
House Prices	132	107063	97443	11887	359468
Population	132	3629210	275192	3177270	4300900
GNP	132	4.15E+10	4.70E+10	6.61E+08	1.65E+11
Mortgage Lending	132	1.50E+09	2.17E+09	3.68E+07	9.09E+09
Rate of Interest	132	9	4	-4	3
House Completions	132	9267	5421	3591	26949
CPI	132	71	28	17	123
ΔHouse Prices	131	2509	4864	-12665	22068
ΔPopulation	131	3629210	275192	-10360	79680
ΔGNP	131	1.23E+09	2.02E+09	-3.00E+09	8.00E+09
ΔMortgage Lending	131	3.96E+07	3.89E+08	-1.53E+09	2.32E+09
ΔRate of Interest _{t-1}	127	-0	1	-4	3
ΔHouse Completions	131	101	1861	-6931	7476
ΔCPI	131	1	1	-1	3

Table 1: Summary statistics and Dickey-Fuller test statistics

Empirical Results

Source	SS	df	MS			
Model	2.1562e+09	6	359365587	Number of obs =	127	
Residual	986273443	120	7552278.69	F(6, 120) =	47.58	
Total	3.0625e+09	126	24305293.4	Prob > F =	0.0000	
				R-squared =	0.7041	
				Adj R-squared =	0.6893	
				Root MSE =	2748.1	

D.hp_lvl	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
pop_lvl						
L20.	-.0396745	.013761	-2.88	0.005	-.0669203	-.0124287
dgnp_lvl						
D1.	1.30e-06	1.27e-07	10.22	0.000	1.05e-06	1.55e-06
mort_val						
D1.	5.50e-06	7.15e-07	7.70	0.000	4.09e-06	6.92e-06
rate_lvl						
L40.	-46.99335	295.8512	-0.16	0.874	-632.7581	538.7714
completion-l						
D1.	.5578027	.1383449	4.03	0.000	.2838894	.8317159
cpi_lvl						
D1.	932.1089	377.7388	2.47	0.015	184.2124	1680.005
_cons	225.7137	427.0255	0.53	0.598	-619.767	1071.194

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of D.hp_lvl

chi2(1) = 5.26
Prob > chi2 = 0.0218

Durbin-Watson d-statistic(7, 127) = 1.823009

Table 2: Regression results with heteroscedasticity and autocorrelation test results

The model overall is significant, with an adjusted R-squared of 69.83% and, visually, the model appears to fit the data well, as can be seen in Figure 4. A scatterplot of the

residuals indicated a small increase in variance over time. A Breusch-Godfrey test was carried out for possible heteroscedastic error terms, and this failed to reject the null of constant error variance. Although autocorrelation is to be expected for time series data, the fact that the first difference had been taken reduced the possibility of this being an issue. A Durbin-Watson test statistic was obtained, the critical upper and lower bounds in this case are (1.651, 1.817), and accordingly failed to reject the null of no serial correlation as $d=1.823 > 1.817$.

All regressors except the interest rate and the constant term were found to be significant at the 1% level - except for inflation, which was significant at the 5% level. They indicate that, after controlling for the effects of rising incomes, population, inflation and supply changes, increased lending activity by banks and building societies did indeed have a positive effect on house prices. On average the model predicts that an increase in the rate at which lending was taking place of €1,000,000 over two successive quarters would add €550 to the increase in house prices over two successive quarters. In 2002:Q2 for example, mortgage lending was €890,000,000 higher than in the previous quarter, and so this model predicts that this added €5,000 to the price of the average house in the space of three months.

The result for the impact of the changes in housing stock is interesting. It implies that an increase in house completion by 1,000 units in two adjacent periods increases the difference in prices between those two periods by €557 on average. Given that the average quarterly increase in completions was 256 houses in the 2000-2007 period; this analysis implies that €4,562 was added to the price of a house in real terms in this period. In the last quarter of 2004, for example, 4,561 more homes were completed than in the previous quarter, implying that this activity generated an increase in prices of €2,540 over the previous period (compared to those increases which would have happened anyway). This counterintuitive result almost certainly lends credence to the implication of irrational behaviour in the market since increased supply, after controlling for population increases, does not usually lead to large price increases.

The monetary policy variable, on the other hand, was found to be highly insignificant. This can be explained by probable multicollinearity with mortgage lending and inflation, since the rate of interest is known to impact on both. The ECB states that it adjusts interest rates to keep inflation low, and low interest rates are likely to increase the demand for mortgage credit. A more sophisticated model that allows for endogeneity of some of the variables would be useful in identifying the impact of the interest rate environment on prices.

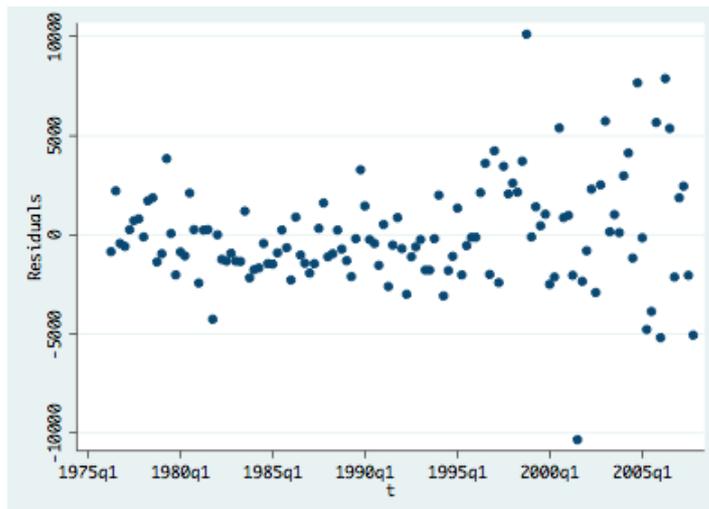


Figure 3: Scatter plot of residuals ordered over time

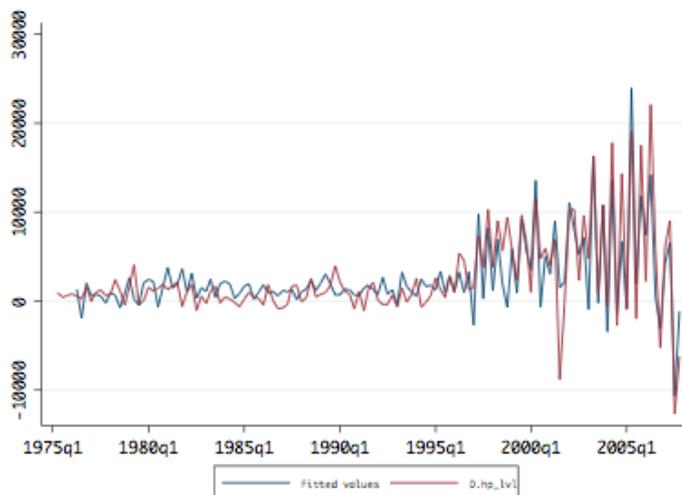


Figure 4: plot of predicted values and the dependent value over time

Conclusion

A lot of recent policy debate and public concern has centred on the lending activity of financial institutions in Ireland. This concern, according to this study, is justified as exceptional growth in mortgage lending in Ireland has played a part in driving prices beyond their fundamental levels. It is clear that the subsequent correction has had a damaging effect - through the creation of negative equity and by negatively influencing consumption. This highlights the importance of regulatory controls for financial institutions and proper oversight in preventing recurrence of such unsustainable levels of lending. More broadly, government intervention could have helped moderate price increases by taxing property owners to disincentivise speculation or by placing stricter constraints on mortgage credit.

While the monetary policy variable was found to be insignificant in this analysis, the behaviour of interest rates still holds lessons. Cyclically low interest rates, indirectly, almost certainly had an effect on mortgage lending, and these had a strong influence

on house prices by making mortgage credit unusually cheap. This is one example of a potential mismatch between economic conditions in Ireland and the wider Eurozone, which ensured an inappropriate monetary policy for this country. This, however, must be set against the clear benefits of membership of the euro, which have become even more apparent with recent economic events.

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Data Sources

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