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Kieran McQuinn

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HOUSE PRICES AND MORTGAGE CREDIT: EMPIRICAL EVIDENCE FOR IRELAND – AN UPDATE

Kieran McQuinn[1]

ABSTRACT

In this Note, the results of an earlier paper by Fitzpatrick and McQuinn (2007), which estimates a long-run mutually reinforcing relationship between credit and house prices in the Irish market, are updated. The Note finds that most of the results of the earlier paper, which were estimated over the period 1981 to 1999, also hold when estimated over the longer time period 1981 to 2020. This is somewhat surprising as the period 2000 to 2020 witnessed significant changes in the Irish housing and credit markets. The results also indicate that, post-2018, the actual average mortgage loan amount is somewhat below the value suggested by the model. This may be due to the adoption of a suite of macroprudential policies by the Central Bank of Ireland in 2015.

1. INTRODUCTION

Fitzpatrick and McQuinn (2007) (henceforth FM) provide an important characterisation of the relationship between house prices and mortgage credit in the Irish residential property market. The paper builds on earlier work by McQuinn (2004), which specified a model of Irish house prices. However, the FM model added a credit channel to the housing model and, in particular, examined the possibility of a mutually reinforcing relationship between house prices and mortgage credit. The establishment and quantification of such a relationship was particularly telling, given the subsequent difficulties which arose in the Irish property and banking sectors, with the emergence of a credit-fuelled bubble post-2003. The emergence of this bubble resulted in Irish credit institutions being particularly vulnerable to the international financial crisis of 2007/2008. Indeed, the difficulties in the Irish banking sector were the main reason for the Irish Government entering into a programme of support with the European Union (EU), the European Central Bank (ECB) and the International Monetary Fund (IMF) (commonly referred to as the 'Troika') in October 2010.[2]

[1] The author is an economist at the Economic and Social Research Institute (ESRI). The author is solely responsible for the views expressed in the paper.

[2] See Honohan (2010) for more on this.

* kieran.mcquinn@esri.ie

The FM model was estimated over the time period 1980 to 1999. Given the developments in the Irish housing and banking sector since then, it is informative to examine how the main results of the model stand up over the longer period 1981 to 2020. Furthermore, can the model yield any insights into the relationship between house prices and mortgage credit in the Irish market today? This is particularly appropriate given the introduction of macroprudential rules by the Central Bank of Ireland in February 2015. These regulations place ceilings on the proportion of mortgage lending at high LTVs and LTIs by domestic financial institutions. The objective of these measures is to increase the resilience of the banking and household sectors to the property market and to try and reduce the risk of bank credit and housing price 'spirals' from emerging in future.[3]

2. MODEL

The FM model can be summarised as follows:

$$P_t = f(Y_t, D_t, C_t, H_t) \quad (1)$$

$$C_t = f(Y_t, r_t, P_t) \quad (2)$$

$$S_t = f(P_t, P_t/B_t, F_t) \quad (3)$$

$$H_t = (1 - \sigma)H_{t-1} + S_t \quad (4)$$

where (1) is an inverted housing demand expression augmented to include a credit channel with house prices P_t being a function of disposable income per capita Y_t, demographics D_t, the average loan amount C_t and the housing stock H_t. The average loan amount (2) is assumed to be a function of income per capita, house prices and the real interest rate r_t. A housing supply function (3) is also included which specifies that actual completions S_t are a function of house prices, house prices deflated by builders' costs B_t and land costs F_t. The system is completed by a perpetual inventory expression (4) for the housing stock.

In the original application, several different estimators were used to deal with the endogeneity issue associated with the credit and house price variables.[4] In particular the Stock and Watson (1993) dynamic ordinary least squares or DOLS approach, which explicitly allows for potential correlation between the explanatory variables and the error process and the Philips-Hansen (1990) fully modified ordinary least squares FM-OLS, which allows for statistical inference within multivariate regressions where the regressors have I(1) processes.

[3] In particular, for non-first-time buyers purchasing a primary dwelling, a limit of 80 per cent LTV will now exist, while lending for primary dwelling purchases above 3.5 times LTI is now restricted to no more than 20 per cent of that aggregate value. The regulations are somewhat more lenient for first-time buyers.

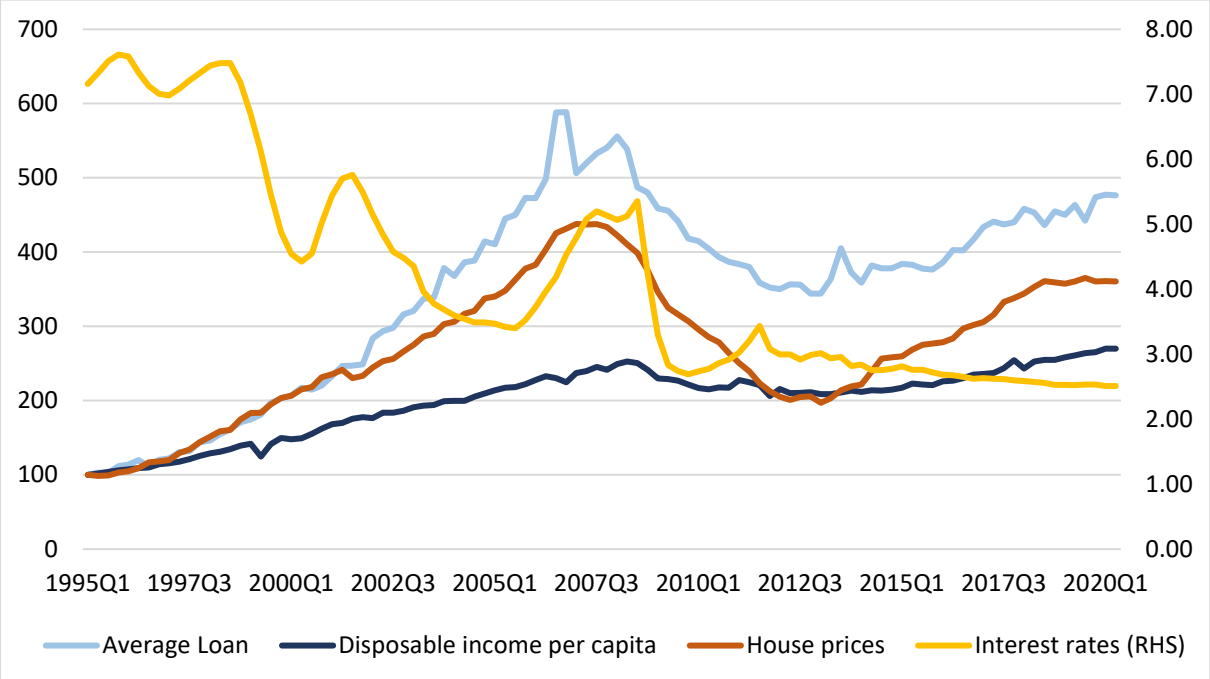
[4] In the present exercise, the same data sources are used as the original model.

The results of these two estimators are then compared with what Hyashi (2000) refers to as static ordinary least squares (SOLS). Given the possibility of endogeneity, no inference on the basis of t-stats is possible with the latter estimator.

3. RESULTS

Figure 1 plots some of the main data used in the analysis.

FIGURE 1 SELECT IRISH HOUSING AND MACROECONOMIC DATA: 1995-2020



Source: Author's calculations.
Note: The average loan size, disposable income and house prices are in index form (1995Q1 = 100). Interest rates are in percentages and can be read on the right-hand axis.

The data are plotted from 1995 to 2020. From both the loan and house price data, the remarkable increase in the period 1995 to 2007 is clearly apparent with the subsequent decline between 2008 and 2013 equally obvious. It is clear that both house prices and average mortgage credit have grown persistently in the period since 2013. What is also evident from the data is, notwithstanding the period after the 2007/2008 crisis, the remarkable improvement in macroeconomic variables over the 1995 to 2020 period. The consistent lowering of mortgage interest rates coupled with the strong growth in income has ultimately fuelled the sustained increase in housing demand over the period.

Table 1 compares the results of the three estimators for Equations (1) and (2) above for the old (1981-1999) and longer (1981-2020) time periods.

TABLE 1 LONG-RUN SINGLE EQUATION FOR HOUSE PRICES AND MORTGAGE CREDIT 1981 TO 1999 AND 1981 TO 2020

	1981-1999 (N=80)					
D. Variable	House Prices (P)			Credit (C)		
	DOLS	SOLS	FM-OLS	DOLS	SOLS	FM-OLS
Y_t	0.914	0.745	0.838	1.04	1.02	1.05
	(5.911)		(4.618)	(2.924)		(6.323)
r_t				0.007	0.009	0.009
				(1.771)		(4.025)
C_t	1.327	1.328	1.315			
	(13.954)		(11.416)			
P_t				0.514	0.519	0.497
				(2.656)		(4.710)
H_t	-1.245	-1.219	-1.209			
	(-14.071)		(-12.332)			
D_t	2.011	2.188	2.229			
	(6.628)		(6.125)			
	1981-2020 (N=162)					
D. Variable	House Prices (P)			Credit (C)		
	DOLS	SOLS	FM-OLS	DOLS	SOLS	FM-OLS
Y_t	0.339	0.269	0.226	1.423	1.364	1.412
	(1.593)		(2.454)	(5.521)		(14.765)
r_t				0.005	0.002	0.003
				(0.593)		(1.162)
C_t	1.068	1.164	1.167			
	(5.722)		(21.077)			
P_t				0.474	0.488	0.468
				(2.727)		(7.195)
H_t	-2.988	-2.857	-3.026			
	(-5.556)		(-13.648)			
D_t	1.648	1.208	1.431			
	(4.240)		(7.012)			

Source: Author's calculations.
Note: T-statistics are in parenthesis. All variables except the real mortgage rate are in logs.

For the 1981 to 2020 time period, focussing on the results for the house prices in the credit regression and for the credit variable in the house price regression, there is a degree of consistency in terms of the scale of the parameter estimates across the different estimators. This mimics the results for the original time period. For

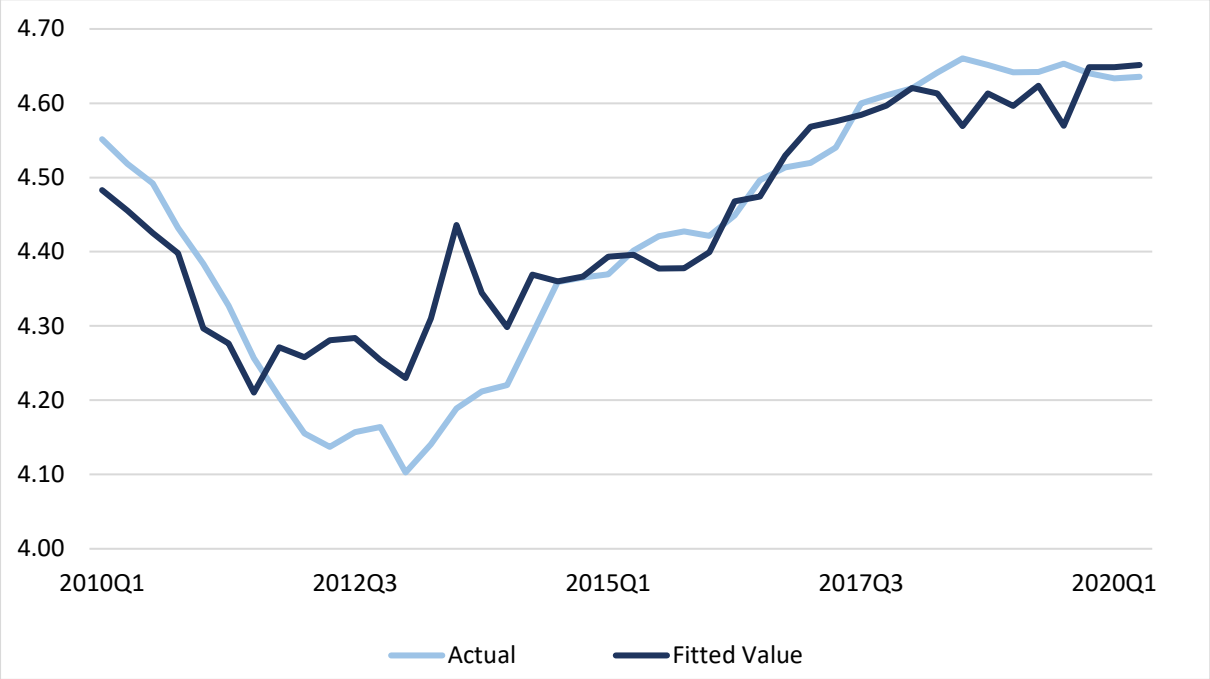
the credit variable, the coefficient is between 1.07 and 1.17, while for the house price variable in the credit equation, the coefficient is between 0.47 and 0.49.

The results also suggest that house prices and credit have similar impacts in the respective equations across the two time periods. In terms of the price variable in the credit equation, this is almost the same as the coefficient for the earlier period (0.50 to 0.52). For the 1981 to 1999 time period, the credit variable in the house price regression has a coefficient range between 1.32 and 1.33. In both cases, the differences in the coefficient values across the two time periods are not significant.

Among the variables, the income variable both in the house price and the credit regression does have a significantly different size between the two periods. It is somewhat smaller in the subsequent period for the house price regression and somewhat bigger in the credit regression. This underpins the importance of income levels in determining the average mortgage amount since 2000. As income levels are more important in determining credit levels, they remain an important determinant of house prices.

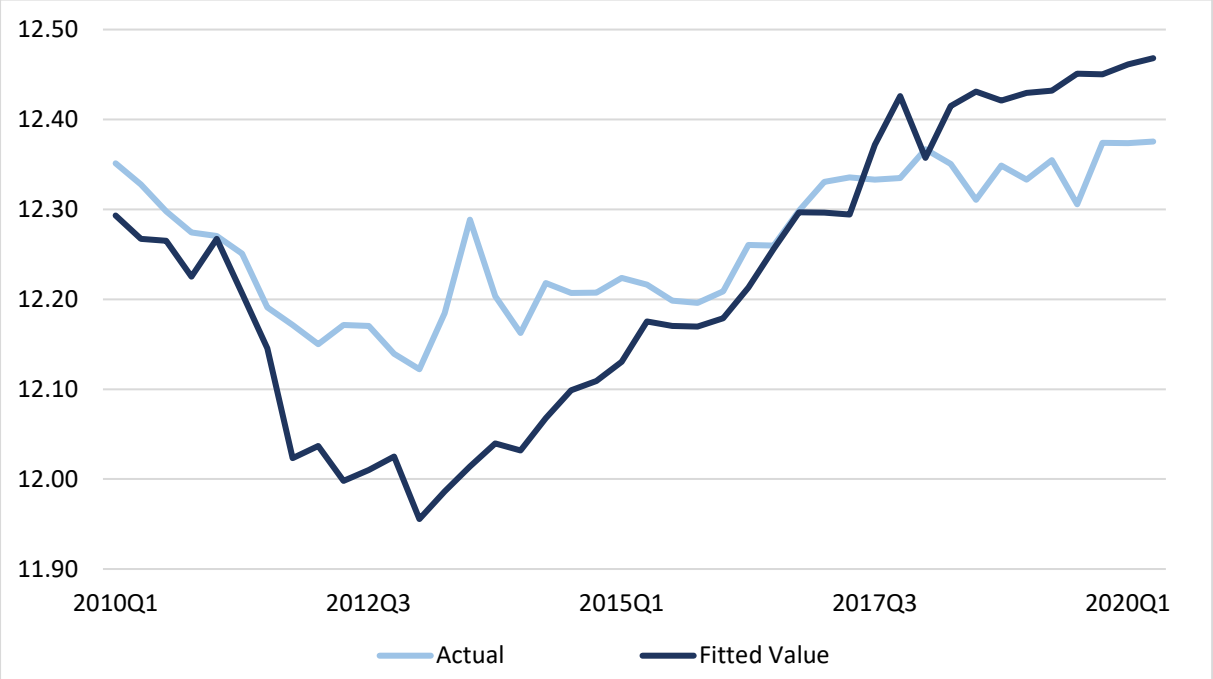
We now examine the actual and fitted values from (1) and (2) in Figures 2a and 2b.

FIGURE 2A RESULTS FROM LONG-RUN HOUSE PRICE MODEL (LOGS): 2010-2020



Source: Author's calculations.

FIGURE 2B RESULTS FROM LONG-RUN CREDIT MODEL (LOGS): 2010-2020



Source: Author's calculations.

The results for the house price model show that house prices have broadly moved in line with what (1) would suggest. For the period 2011 to 2013, actual house price falls exceed those predicted by the model. This is not surprising as the scale of the housing market decline at that stage may have resulted, for example, in a total decline in confidence amongst perspective residential investors. This would cause prices to fall by more than what the model suggests. This could also be the reason why the average loan amount model did not appear to fall by as much as what the decline in house prices, in particular, would suggest for the same period.

However, there is also a divergence between the actual loan amount and the level suggested by the model for the end of the period. From the start of 2018, the model suggests that the average loan amount should be continuing to increase, whereas the actual amount has remained static. On average the actual loan amount is over 8 per cent below the level suggested by the model over the 2018/2020 period. The most obvious reason for this divergence is the introduction in 2015 by the Central Bank of Ireland of a suite of macroprudential measures which limit the amount of mortgage lending at high LTVs and LTIs by domestic financial institutions. It may well be the case that the regulations are limiting the increase in the average loan amount to be below that which it otherwise would be. Of course, by restricting the increase in the average loan amount the regulations are then, in turn, restricting the increase in house prices. The results in Table 1

would suggest, for example, that a 1 per cent increase in the average amount loaned would cause house prices to increase by 1.1 per cent.

4. CONCLUDING COMMENTS

An update of the Fitzpatrick McQuinn (2007) model of house prices and mortgage credit in the Irish market indicates that the key coefficients estimated in the model have remained relatively stable when estimated over a longer time period (1981 to 2020). This is somewhat surprising as the interim period (post-2000) has witnessed one of the largest house price / mortgage credit spirals observed amongst OECD countries.

The results reiterate the notion of a mutually reinforcing relationship between mortgage credit and house prices in the Irish market. This relationship is underscored by a simulation of the model, which reveals that the average loan amount suggested by the model post-2018 is somewhat higher than the actual loan amount. This suggests that the recent macroprudential policy framework introduced by the Central Bank of Ireland is restricting the average loan amount to be less than what it would be if the regulations were not in place.

REFERENCES

Fitzpatrick, T. and K. McQuinn (2007). 'House prices and mortgage credit: Empirical evidence for Ireland', *The Manchester School*, Vol. 75, No. 1, pp. 82-103, 2007.

Honohan, P. (2010). *The Irish Banking Crisis Regulatory and Financial Stability Policy 2003-2008. A Report to the Minister for Finance by the Governor of the Central Bank*.

Hyashi, F. (2000). *Econometrics*, Princeton University Press, Princeton, New Jersey.

McQuinn, K. (2004). 'A model of the Irish housing sector', Central Bank of Ireland Research Technical Paper 1/RT/04.

Philips, P. and B. Hansen (1990). 'Statistical inference in instrumental variables regression with I(1) processes', *Review of Economic Studies*, 57, pp. 99-125.

Stock, J. and M. Watson (1993). 'A simple estimator of cointegrating vectors in higher order integrated systems', *Econometrica*, 61, pp. 783-820.