Banking & Payments Federation Ireland

Central Bank of Ireland call for evidence based submissions on

Macro Prudential Policy for Residential Mortgage Lending

August 2016

Banking & Payments Federation Ireland

www.bpfi.ie

Contents

1. Executive Summary

We welcome the opportunity to respond to the Central Bank of Ireland (CBI) call for submissions on the Loan-to-Value (LTV) and Loan-to-Income (LTI) Regulations. These regulations were introduced as part of the macro-prudential mortgage market measures (Macro Prudential Measures) set out in the CBI (Supervision and Enforcement) Act 2013 (Section 48, Housing Loan Requirements) Regulations 2015, SI 47 in February 2015 (the regulations).

BPFI and its member banks recognise the importance of ensuring the stability of the banking system and of protecting households from the risks of over-indebtedness. We support the CBI in ensuring that the Irish financial system is strengthened and resilient to further risks and challenges. Our members have implemented the Macro Prudential Measures and we are continuing to assess their impact on the mortgage market and the wider economy.

The design and calibration of residential real estate Macro Prudential Measures shapes their effectiveness and should take into account the objectives of the regulator in introducing or amending the measures, the characteristics of and conditions in the national real estate markets, as well as their coverage (especially products, collateral and customers) and the use of exemptions or proportionate caps, which can help to minimise leakage or unintended side effects. We have commissioned work of the ESRI to further assist the CBI in its deliberations on the impact of the measures, details of which are in the Appendix.

Ongoing review of the impact of these Macro Prudential Measures combined with the potential for adjustment to the parameters will serve to support the objectives of the regulations. The updated circumstances evident in the Irish market should be considered when reviewing the material gathered during the call for evidence process. Taking account of the current market place and the quality of new mortgage lending, we are proposing the following recalibration of the regulations to address issues that have emerged since their introduction in February 2015:

- Increase the threshold for the First Time Buyer cohort from 'up to 90% of €220,000 to 'up to 90% of €300,000'
- Exempt equity release for home improvements from the LTV regulations
- Extend the two month time limit for valuation reports to four months
- Consider the difficulties encountered by those in the 'Renters' cohort and those second time buyers who have recently returned to a minor amount of positive equity
- Include a 'safety tolerance' within the current limits to allow for a smooth operation of the regulations
- Limit the data obligations for lenders to the specific requirements of the regulations.

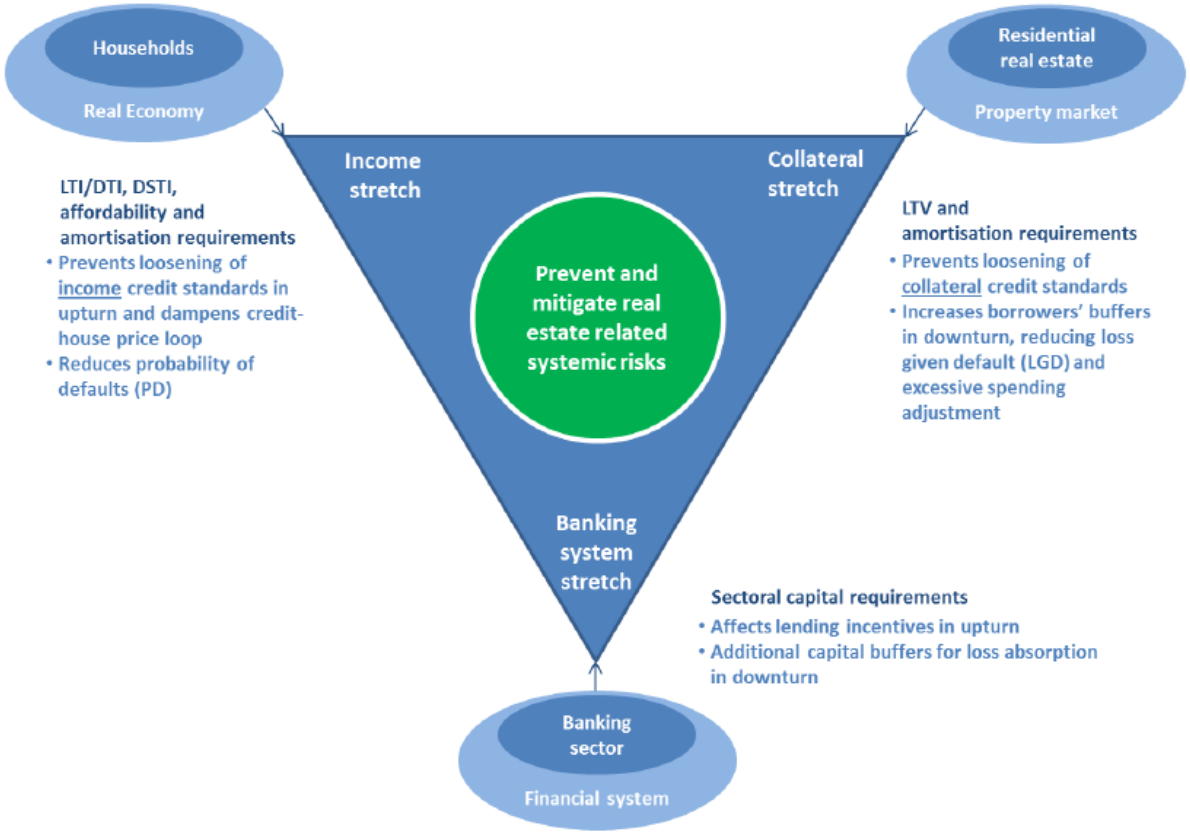
2. Introduction

We are continuing to assess the published data and analysis available in relation to macro prudential regulations both in Ireland and the global financial markets. In order to provide context for our proposals and observations we have included some analysis of recent international experience as well as information on the current housing and mortgage market below. We believe that this context helps to address some of the issues raised by analysts and commentators in reviewing the impact of the regulations on the Irish market.

An Overview of RRE-MPMs

Figure 1

Instruments by stretches related to real estate lending



Source: (ESRB, December 2015).

As Chart 1 above illustrates, different residential real estate macro prudential measures (RRE-MPMs) have different purposes, target different parts of the economy and operate through different channels. The CBI's stated objectives (Central Bank of Ireland, 2015) for their Macro Prudential Measures are to:

- Dampen the pro-cyclical dynamics between property lending and housing prices
- Increase the resilience of banking and household sectors to financial shocks
- Be able to stand the test of time and become a generally accepted standing feature of the mortgage market

The CBI's mortgage regulations combine an income stretch instrument (LTI) with a collateral stretch instrument (LTV).

Income stretch

According to the European Systemic Risk Board (ESRB, December 2015), LTI and other 'income stretch' instruments "only affect those borrowers or credit standards of institutions that will result in the most stretched conditions, hence shaping the tail of the distribution, in contrast to general restrictions on credit growth." They are generally applied to new mortgage loans. The ESRB notes that the introduction of LTIs can put down downward pressure on house prices so they "should preferably be introduced and/or tightened during the build-up phase when real estate prices are increasing".

Ireland and the UK are the only EU countries to have introduced LTI limits – though the CBI has flagged that it will consider implement a debt-to-income (DTI) cap once the central credit register is established. In the meantime, lenders use a Debt Service Ratio (DSR) or Net Disposable Income (NDI) calculator as robust indicators of sustainable repayment capacity. NDI is well-embedded in all lenders, is well-known and regarded by CBI and is a core tool employed in managing credit risk. No other EU country has introduced a DTI limit.

The Bank of England's Financial Policy Committee found that UK households with gross DSRs (debt service ratios) "in excess of around 40% were more likely to experience payment difficulties" (Bank of England, 2014). According to the Bank of England, a debt service ratio or gross income ratio (loan divided by income) of 35-40% equates to LTI ratios of around 4.25-4.75.

Finansinspektionen, the government agency responsible for financial regulation in Sweden, has considered the impact of a DTI limit noting (Finansinspektionen, 2016) that it would decrease indebtedness, the risk of a financial risk and the consequences of a crisis. However, a *"DTI limit would also introduce limitations on the ability of households to borrow and smooth their consumption over their life cycle…There is therefore a risk that a DTI limit that is too restrictive and would have a broad impact on households' lending possibilities could be the factor that triggers the course of events that the regulations intended to prevent."*

We believe that the ability of households to borrow and smooth consumption within a reasonable set of criteria should be taken into account in determining the overall levels of any macroprudential policy.

Collateral stretch

While 'income stretch' measures (LTI) are ex ante measures to reduce the probability of default with a customer focus, 'collateral stretch' measures (LTV) are ex post measures that aim to reduce the impact of materialising risks on the lender, usually expressed through the loss given default.

The ESRB notes that while the long-run effect of an LTV cap is expected to be positive, "it can be negative in the short run as a house price reduction will increase the LTVs on existing loans and thus increase LGD[1]. Therefore, such instruments should preferably be introduced and/or tightened during the build-up phase when real estate prices are increasing." Fifteen EU countries and Norway have introduced LTV requirements.

[1] Loss Given Default

Irish Market

The overall summary of the latest available data on key indicators within the Irish property market is included in Table 1 below – as published in our ***Housing Market Monitor***. This table identifies some of the more challenging aspects of the housing market, particularly the lack of availability of homes to rent or buy and the increase in rental costs for consumers. We would also add that the level of completions and commencements includes a large number of 'one off' homes although there is a positive increase in the level of completions compared with previous quarters.

Table 1

Indicator	Trend	Q2 2016	YoY change
Dwelling completions	↑	3,498	16.8%
Dwelling commencements	↑	3,065	32.6%
Dwellings listed for sale	↓	15,126	-6.9%
Dwellings listed for rent	↓	17,767	-13.2%
Year on year change in transaction prices	↑	6.6%	
Year on year change in list prices	↑	6.3%	
Year on year change in list rents	↑	11.0%	
Average rent nationwide	↑	€899	7.5%
Transactions	↓	11,307	-2.3%
Mortgage approvals	↑	8,161	9.6%
Mortgage drawdowns	↑	6,803	11.2%

Source: BPFI Housing Market Monitor, August 2016

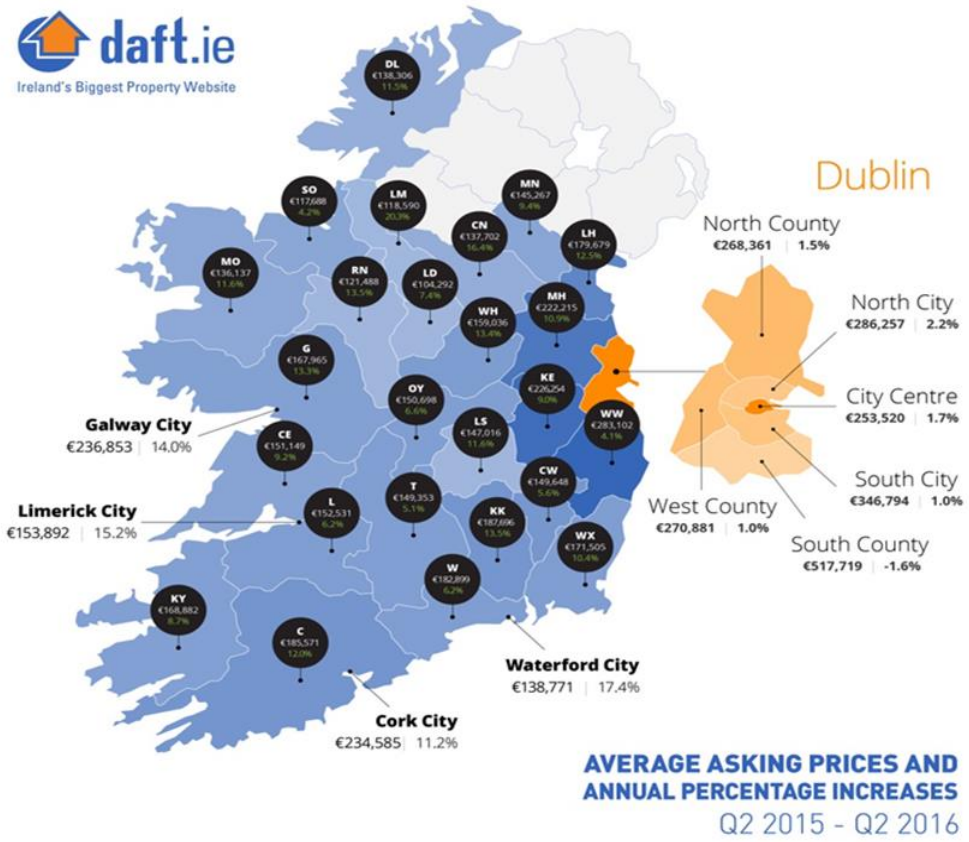
There were 6,803 mortgage drawdowns in Q2 2016, valued at €1,286 million. This brings the value of total drawdowns to around €2.3 billion in the first half of 2016 compared to around €2.1 billion in the same period in 2015. The number of drawdowns rose by 11.2% year-on-year, while the value of drawdowns rose by 17.9%.

Latest approvals data show that a total of 14,314 mortgages were approved in the first half of 2016, valued at €2,749 million, compared with 14, 539 mortgages valued at €2,721 million in the same period of 2015. The number of approvals fell by 1.6% year-on-year while the value of approvals rose by 1%. As there were differing seasonal factors during 2015 and 2016 any trends should be interpreted carefully and we will continue to analyse the mortgage data within the context of the overall housing market indicators.

House prices

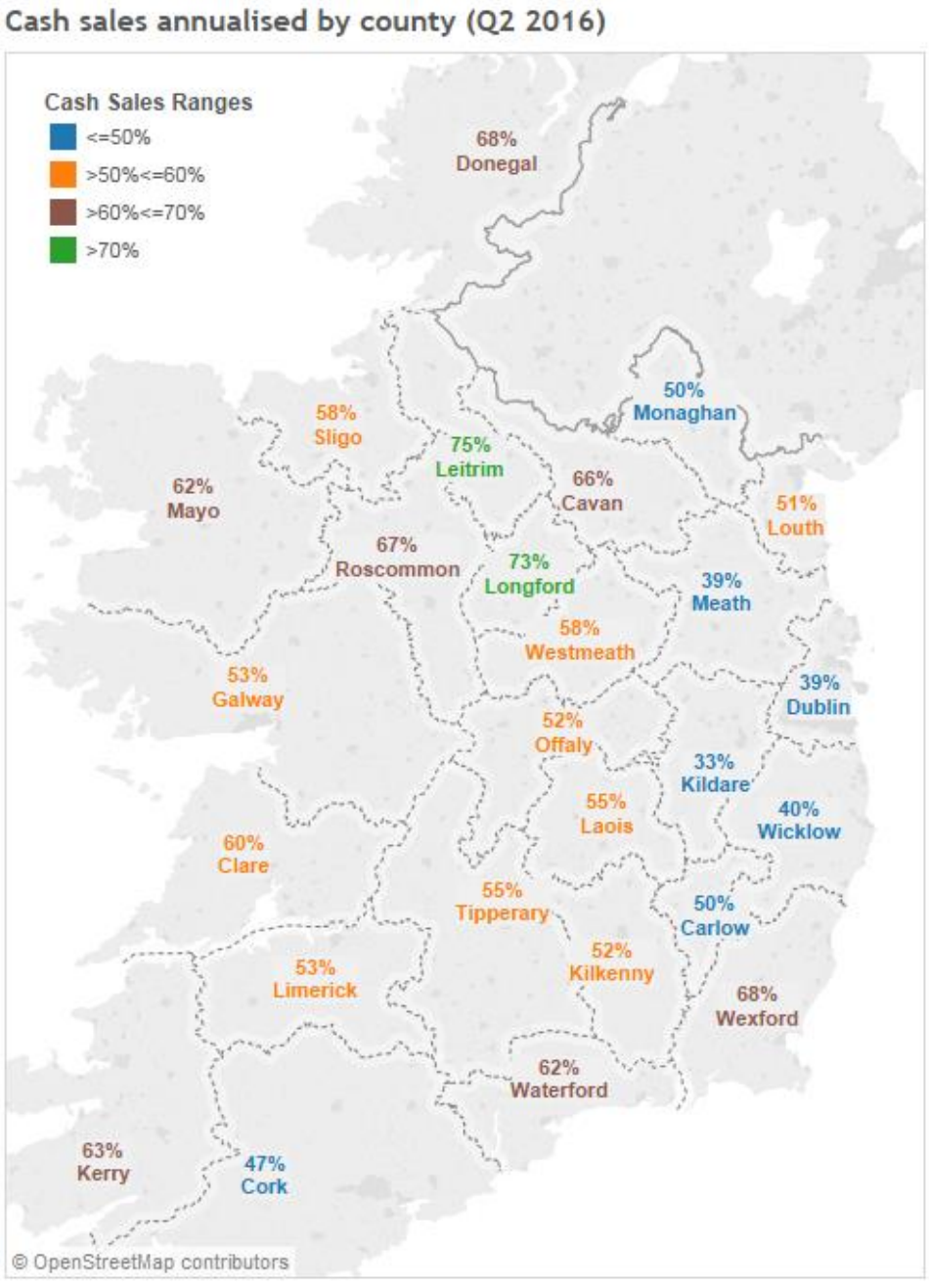
According to the latest research from Daft.ie, there is evidence of a stabilising of asking prices in the Dublin area along with steady increases elsewhere. The report also points to evidence of a shift from 'sought after locations' to 'lower cost locations' and the potential for unintended consequences of the CBI macro prudential policy where it operates without consideration of other drivers of the housing market.

Figure 2



We also see evidence of cash sales continuing to play a major role in the housing market, accounting for almost half of all transactions in Quarter two 2016. The spread of cash as a key factor across the property transactions completed in Quarter two is set out in Figure 3 below:

Figure 3



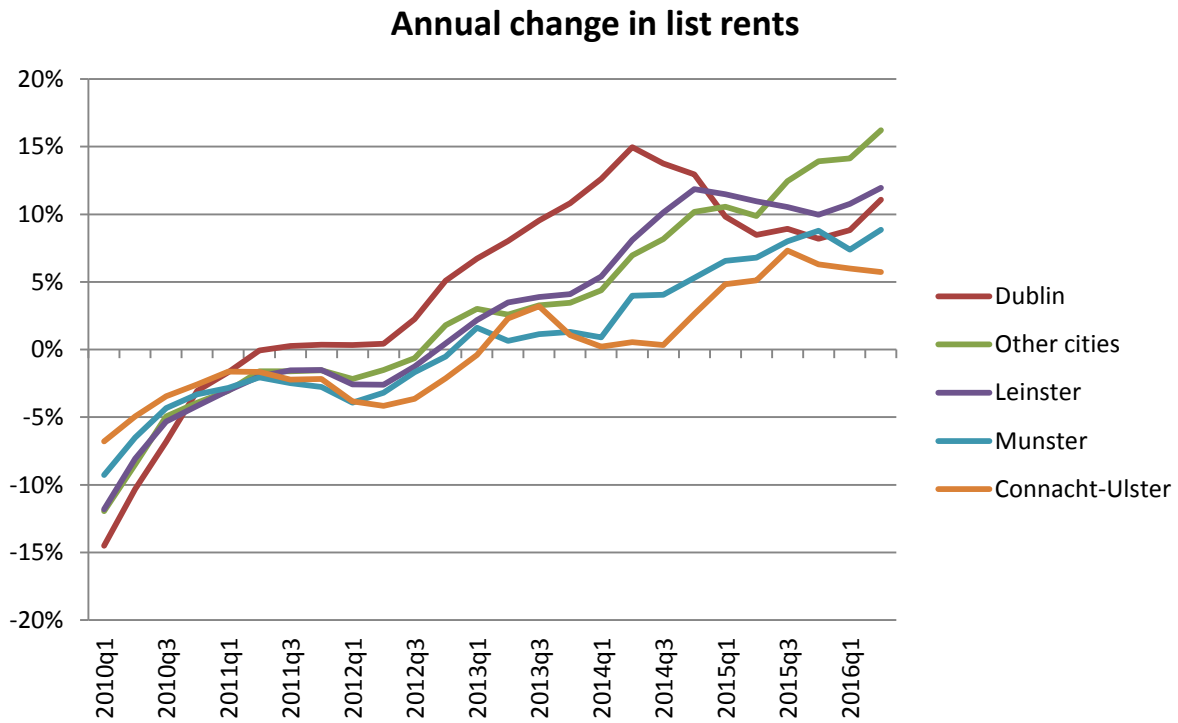
Source: CSO and BPFI data

Rental market

The alternative for those seeking to purchase a property is to look at the rental market. This area is one that shows continuing increases across the country as set out in Figure 4. Inflation in listed rents nationwide rose from 9.3% in March to 11% in June 2016. The national rate of inflation has now been close to 10% for nine successive quarters.

In Dublin, the rate of inflation was 11.1% in the second quarter of 2016, its highest level since Q4 2014. In the other cities, rent inflation reached a cycle high of 16.2% in June 2016, while in Leinster (outside Dublin) inflation stood at 12%, also a new high for this market cycle. In Munster (8.9%) and in Connacht-Ulster (5.7%), rental inflation remained below the national average.

Figure 4

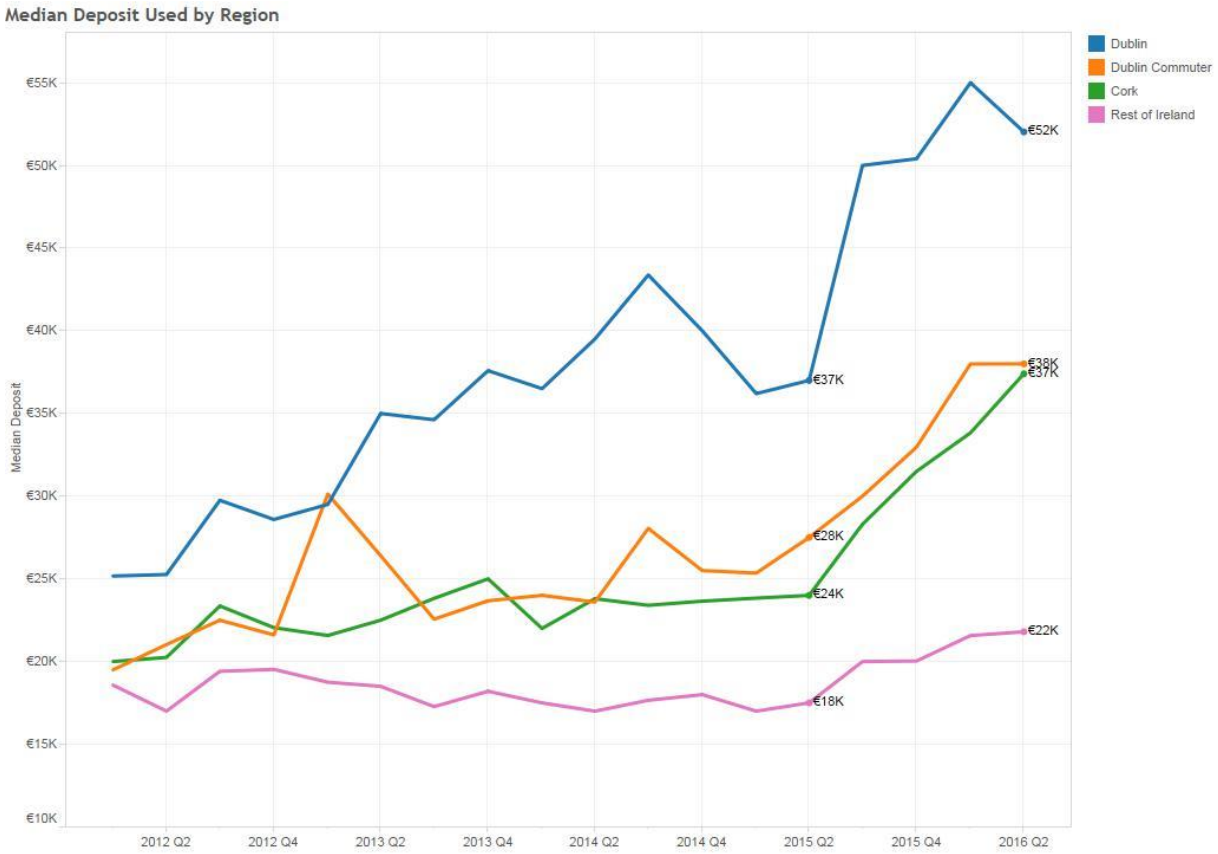


Source: Daft.ie

Affordability

In reviewing the mortgage and wider housing market we have also examined the recent trends in deposit data based on an analysis of BPFI loan level information. There is evidence of a sharp increase in the amount of deposits being used in the purchase of property. This output points to an increasing challenge for those in the rental market to accumulate funds for a property purchase unless they have the benefit of financial support from family and friends.

Figure 5



Source: BPFI

3. Assessment of impact of Macro Prudential Measures

In our submission in response to the CBI Consultation published in December 2014 (CP 87) we worked with the ESRI on an assessment of the proposed Macro Prudential measures. As a follow up to that study, we have again commissioned the ESRI to assess the impact of the Macro Prudential Measures on the credit and housing markets in Ireland.

The ESRI paper is included as an appendix to our submission and provides analysis for consideration in the examination of the Macro Prudential Measures.

As set out in the Introduction, the ESRI paper has two distinct components. The first uses an existing model of the overall Irish housing and banking sectors (Gerlach-Kristen and McInerney. (2014), Duffy, McQuinn and McInerney (2016)) to examine how the macroprudential measures have impacted on key housing variables such as prices, supply and credit levels over the period during which the measures have been implemented.

The second part of the paper also draws on existing ESRI research to examine a more specific question: - namely, how the measures have impacted on the relative costs of tenure and how this affects households' tenure choice. This latter issue is important as most of the analysis undertaken of the Macro Prudential Measures tends to focus on headline housing indicators; however, there are, as the analysis shows, significant effects of the Macro Prudential Measures on other key housing issues.

The following extract provides an indication of the type of insight that the analysis can provide from a review of the results:

The results from our scenarios suggest that the impact of the mortgage restrictions only began to take hold in the second half of 2015 and early 2016 as the weighted average of LTVs and LTIs started to fall. The results suggest that the LTV has become the more binding restriction of the two in the most recent period. By 2016 Q1 the combined effect of the LTV and LTI restrictions has been to reduce new mortgage credit by approximately 10 percent relative to the baseline of no change in the ratios. The effect on the housing market is as yet quite muted with house prices being only approximately 0.05 percent lower than in the baseline as at 2016 Q1. The results also show that the effect of the macroprudential rules on housing supply has been effectively zero at this point but this is not surprising given the lags involved in construction.

The concluding comments from the analysis are included here for ease of reference, with the full report included in the appendix:

In this report we have analysed the implications for the Irish housing and credit sector of the recent macroprudential measures introduced by the Central Bank of Ireland. While the macro level assessment of the measures implications is limited somewhat by the relatively short period of time for which they have been in place, it is clear that the measures, as noted in Duffy et al. (2016), have had a contractionary impact on lending in the Irish market. This analysis also suggests that housing supply levels are less now than what they otherwise would have been in the absence of the macroprudential measures.

In the report we also examine the implications for tenure choice of the macroprudential measures, mainly through the user of cost of capital concept. Our results indicate that a policy which lowers the effective LTV ratio will lead to a permanent decline in the house price to rent ratio. In other words, lower, binding LTVs result in permanent increases in rents for a given house price level as more people move towards renting rather than owning a home.

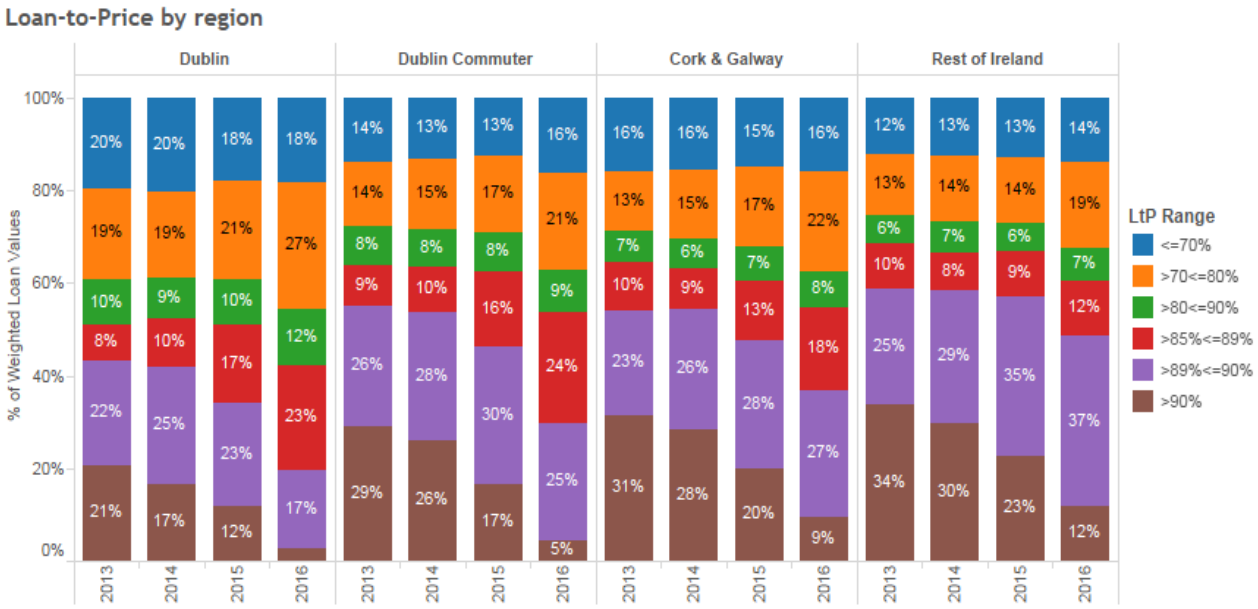
This raises an important issue for policy makers to consider. The imposition of a LTV rule, which changes rents relative to house purchase prices, ultimately reflects a change in the tenure preferences of households. An increase in the proportion of people renting in the economy has implications for the nature of the housing stock to be constructed. This warrants attention at a time in the Irish market when a number of policy considerations are being considered to stimulate housing supply. For example, Lyons (2015) suggests that building regulations should be amended to facilitate greater housing supply. However, this may reduce the appropriateness of the new housing stock to meet the changing tenure requirements.

4. Recommendations

4.1 First Time Buyer Loan to Value (LTV)

The LTV cap for First Time Buyers is set at 90% for borrowings up to €220,000 and 80% above this level. As expected and as set out in the chart below, the limit has resulted in a shift away from high LTV loans across all regions of the country. The chart shows the ratio of loan to purchase price (LtP) from 2013 to H1 2016.

Figure 6

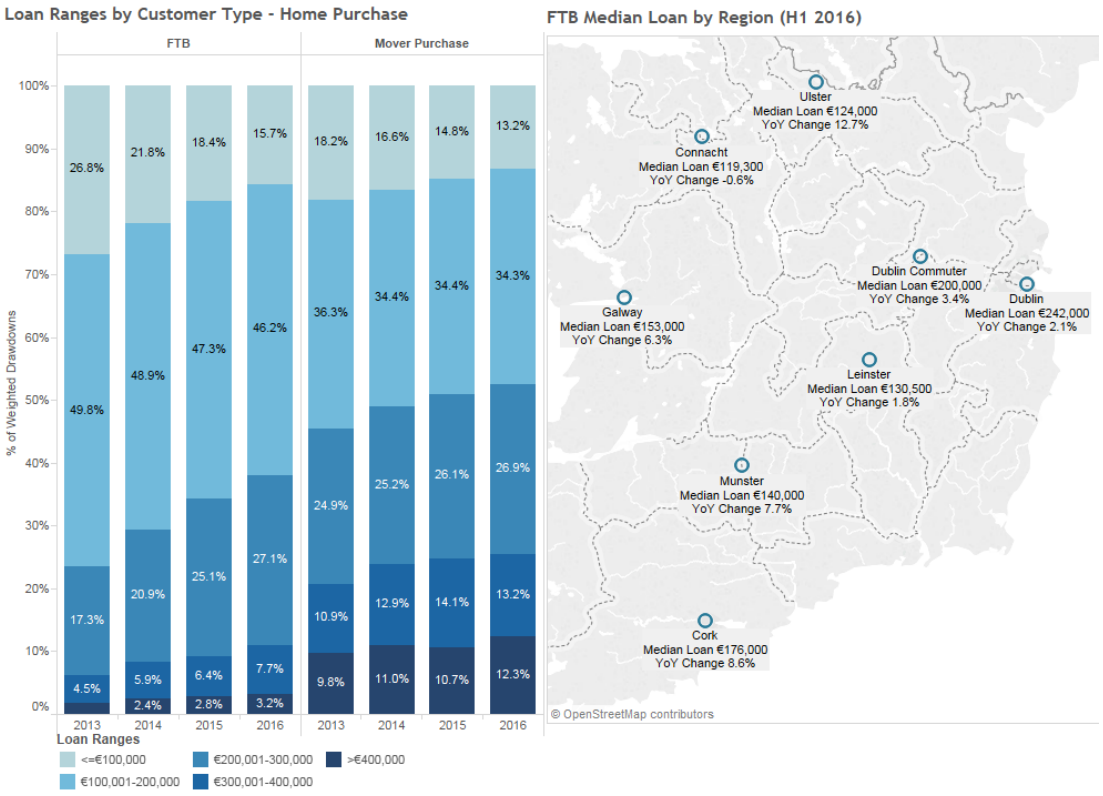


Source: BPFI

Our assessment of the impact of the LTV regulations is that the 90% cut off at €220,000 is affecting FTBs in a disproportionate way in particular areas i.e. Dublin, Dublin region, Cork and Galway. As evidenced in the Figure 2 (Daft.ie house prices page 8), house prices in these areas vary significantly from the rest of the country. This disparity in mortgage level that results from the cut off at €220,000 versus a FTB who can purchase property for less than this amount can only be met by an increase in funds from other sources. The result is the exclusion of some cohorts of potential borrowers from the property market.

It should be noted that our recommendations do not seek to adjust the LTI cap and under this proposed recalibration all FTB borrowers will continue to be required to meet the current 3.5x LTI limit so that they can show affordability in terms of repayments. The primary assessment methodology utilises NDI criteria which focuses on proving sustainable repayment capacity. This combined with the requirement to meet a stress test measure of +2% on any mortgage before an approval can be provided will ensure that our proposed change will not result in borrower over-indebtedness.

Figure 7



Source: BPFI

Recommendation – FTB LTV

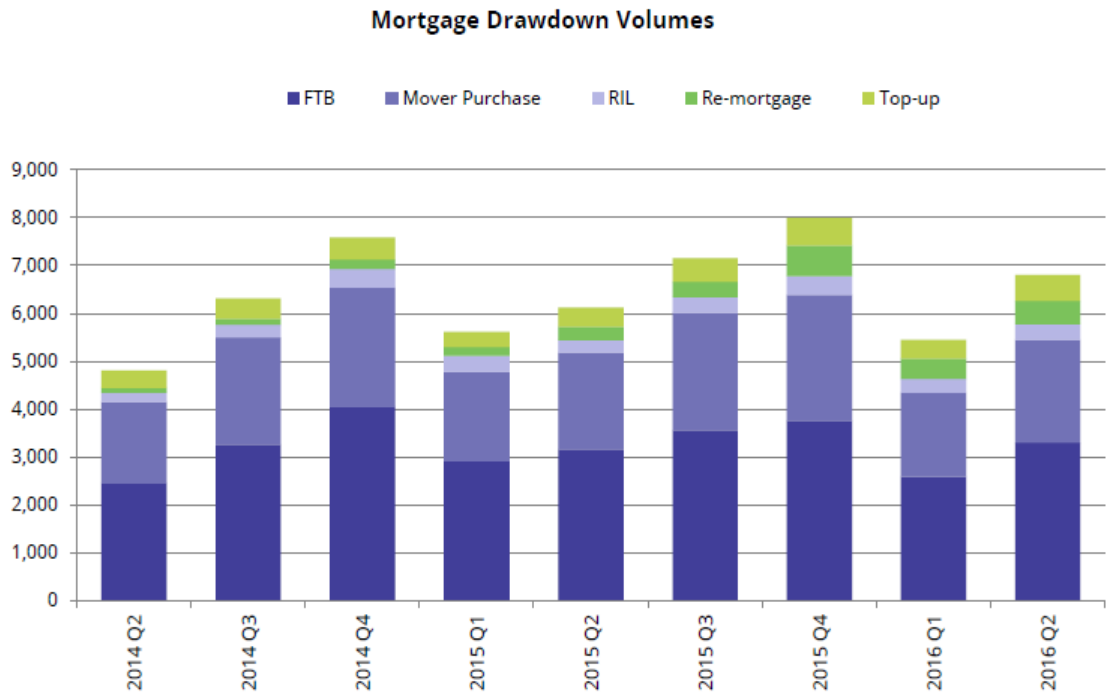
We are recommending a recalibration of the regulations to increase the threshold for the First Time Buyer cohort from €220,000 up to 90% of €300,000. This will particularly support those seeking to purchase homes in large urban centres.

4.2 Equity release

We have identified the cohort of equity release for home improvements as a category of borrowing that could be considered within the recalibration of the regulations. This observation is based on the premise that the property is already owned, and as a result the borrowing relates to property enhancement often to accommodate changes in the needs of the borrower. Any loans in this category will not impact on the overall property market or the value of any property transactions.

In terms of impact on the market, the latest mortgage drawdown data indicates that 'top ups' account for only 8% of the volume and 2.9% of the value of all loans in Quarter 2 2016. Figure 8 below sets out the trend in mortgage drawdown volumes by cohort from Q2 2014 to Q2 2016.

Figure 8



Source: BPFI

Recommendation:- Equity release for home improvement

Notwithstanding the size of this cohort, it is our recommendation that exempting this category from the LTV cap would provide significant benefit to home owners, allowing banks to support them in extending or upgrading the property and resulting in an improved value of the housing stock.

As set out in our recommendation in respect of FTB, no recalibration of LTI is proposed and the cap of 3.5 x LTI would continue to apply thus also ensuring that this change does not adversely impact household over-indebtedness.

3.3 Valuations

Under the Regulations introduced by the Central Bank in February 2015, a valuation must not be more than two months old at the time of drawdown. We believe that this requirement would merit further consideration in a review of the impact of the regulations.

Noting the timeline in conveyancing transactions which is outside the control of the borrower, we believe that the current two month time limit is unnecessarily tight. Taken with the current

levels of stability there would appear to be scope to address this matter in a minor adjustment to the existing regulations.

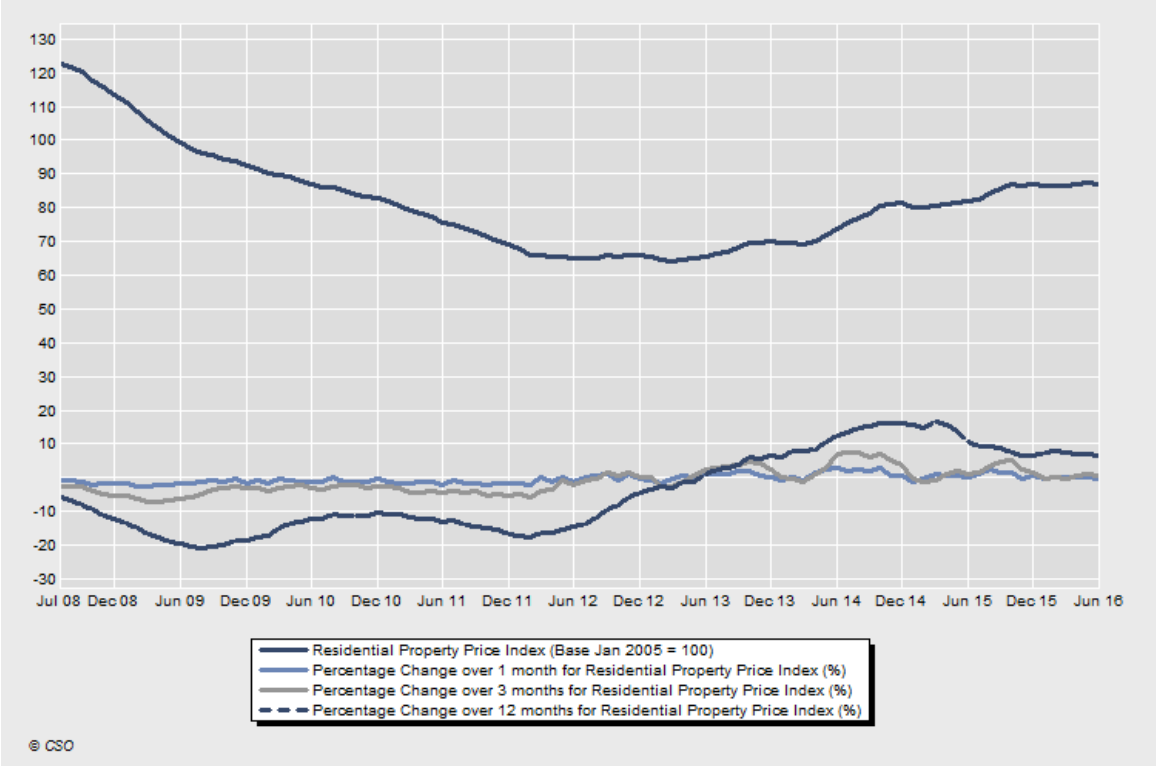
We would also note that where a second valuation is required; the cost is borne by the loan applicant in most cases, and the requirement to organise the updated valuation is causing borrowers additional distress due to delays in closing. We are aware that lenders have received and recorded complaints from borrowers in relation to valuation reports. A significant number of these complaints related to the valuation reports expiring prior to the mortgage being drawn and the need to put a new valuation in place with its additional costs and delays.

A number of recent developments could underpin a modification of this requirement to a more normal time period. As an example, the standards for property valuation in Ireland have been further enhanced following implementation of the European Union (Consumer Mortgage Credit Agreements) Regulations in March 2016.

We have also seen a substantial improvement in the stability of the property price register since the significant falls in property values in 2007/2008, see figure 9 below. According to the findings from the latest CSO report, residential property prices have decreased by 0.1% in the month of June 2016. This compares with an increase of 0.2% in May and an increase of 0.1% recorded in June of last year. In our view, the level of stability may reduce the need for an updated valuation every two months.

Figure 9

Residential Property Price Index – All Residential properties July 2008 – June 2016



Recommendation:- Valuations

Based on these developments in the market, we believe there is scope to include a removal of the two month time limit for valuations and a return to a more reasonable period; we suggest four months, aligned with current market conditions.

3.4 Renters

We wish to draw the Central Bank attention to the difficulties encountered by those who are paying the current levels of rent, while also attempting to accumulate the required level of savings in order to meet the LTV criteria, has been observed by our members. We are also aware of the potential impact on the rental market as those in the 'rental cohort' look to extend their tenure in order to build up the required deposit for the purchase of their new home.

As a result, this particular customer cohort could be identified as a category of borrower for further consideration. We suggest that consideration be given to facilitating those who have proven rental outgoings[2] over an agreed amount and for a specified minimum time period (24/36 months) perhaps with an adjustment to the 90% LTV cap.

We include the following example, based on published data, to provide an indication of the type of applicant that could be considered within this particular cohort:

Figure 10

Asking price of property	€325,000	Deposit required	€43,000
Mortgage	€282,000	Monthly repayment	€1,395.54
Current rent	€1,302	Monthly Saving	€600
Length of time to accumulate	€43,000	6 years	
Applying a special 'Rental exemption' (10% of €300,000 + 20% of €25,000)			
Asking price of property	€325,000	Deposit required	€35,000
Length of time to accumulate	€35,000	4 years and 10 months	

Source: www.daft.ie and www.propertypriceregister.ie

Based on purchase of a 3 bed property in Parkside, Balgriffin, Dublin 13 with a 30 year mortgage at a variable rate of 4.3% compared with the average rent for a 2 bed house in Dublin 13.

[2] Based on evidence provided of payments for rental accommodation through bank account statements

The comparison between the cost of rental and mortgage repayments is analysed in detail in the recent *Daft.ie Rental Report Q2*. An extract from the report is included in Figure 11 which shows the latest data related to 1 bed apartments as well as 2 and 3 bed homes.

Figure 11 – Daft.ie analysis 'To buy or to rent?'

		1 bed apartment			2 bed house			3 bed house		
		Mortgage (4.3%)	Mortgage +2%	Rent	Mortgage (4.3%)	Mortgage +2%	Rent	Mortgage (4.3%)	Mortgage +2%	Rent
DUBLIN	Dublin 1	€705	€885	€1,237	€1,042	€1,309	€1,504	€1,436	€1,803	€1,847
	Dublin 2	€940	€1,180	€1,462	€1,288	€1,617	€1,741	€1,862	€2,338	€2,097
	Dublin 3	€861	€1,081	€1,240	€1,186	€1,489	€1,451	€1,639	€2,059	€1,673
	Dublin 4	€1,135	€1,426	€1,610	€1,639	€2,059	€1,861	€2,421	€3,040	€2,147
	Dublin 5	€656	€824	€1,082	€879	€1,103	€1,265	€1,298	€1,630	€1,531
	Dublin 6	€1,079	€1,355	€1,350	€1,445	€1,815	€1,579	€2,135	€2,681	€1,911
	Dublin 6W	€902	€1,133	€1,259	€1,209	€1,518	€1,472	€1,786	€2,242	€1,781
	Dublin 7	€669	€840	€1,149	€896	€1,126	€1,343	€1,324	€1,663	€1,626
	Dublin 8	€685	€861	€1,215	€918	€1,153	€1,421	€1,357	€1,704	€1,720
	Dublin 9	€684	€859	€1,103	€916	€1,150	€1,290	€1,353	€1,700	€1,561
	Dublin 10	€424	€533	€950	€569	€714	€1,110	€840	€1,055	€1,344
	Dublin 11	€511	€642	€1,040	€685	€860	€1,217	€1,012	€1,271	€1,473
	Dublin 12	€581	€730	€1,088	€779	€978	€1,273	€1,151	€1,445	€1,540
	Dublin 13	€696	€874	€1,113	€933	€1,171	€1,302	€1,378	€1,731	€1,575
	Dublin 14	€866	€1,088	€1,253	€1,161	€1,458	€1,465	€1,715	€2,153	€1,773
	Dublin 15	€528	€663	€999	€707	€888	€1,168	€1,045	€1,313	€1,414
	Dublin 16	€751	€943	€1,134	€1,006	€1,264	€1,326	€1,487	€1,867	€1,605
	Dublin 17	€465	€584	€934	€623	€782	€1,092	€920	€1,156	€1,321
	Dublin 18	€854	€1,072	€1,251	€1,144	€1,437	€1,462	€1,690	€2,123	€1,770
	Dublin 20	€615	€773	€1,080	€824	€1,035	€1,263	€1,218	€1,529	€1,529
	Dublin 22	€440	€552	€976	€589	€740	€1,141	€870	€1,093	€1,381
	Dublin 24	€471	€592	€1,004	€632	€793	€1,174	€933	€1,172	€1,420
	North Co Dublin	€539	€676	€945	€722	€906	€1,105	€1,066	€1,339	€1,338
	South Co Dublin	€1,005	€1,262	€1,311	€1,347	€1,691	€1,533	€1,990	€2,499	€1,855
	West Dublin	€533	€670	€974	€714	€897	€1,138	€1,056	€1,326	€1,378
OTHER CITIES	Cork City	€382	€480	€780	€506	€636	€898	€834	€1,048	€1,087
	Galway City	€357	€449	€672	€474	€595	€773	€781	€980	€936
	Limerick City	€262	€329	€596	€347	€436	€687	€573	€719	€831
	Waterford City	€225	€283	€514	€298	€375	€592	€492	€618	€717

Note: This assumes a mortgage with a variable interest rate of 4.3% (with additional case where rate is 2 percentage points) 30 year term and 85% LTV.

Source: The Daft.ie Rental Report Q2 2016

3.5 Second Time Borrowers (LTV > 90% < 100% on existing property)

From our assessment of the impact of the regulations we believe that there is evidence of a limiting effect on the cohort of 'Second Time Borrowers' (STB) who find themselves in a position of marginal positive equity. These borrowers purchased 'starter homes' in the years immediately preceding the financial crisis. These borrowers may have been in negative equity but have recently returned to minimal positive equity. They have also met their mortgage repayments throughout the term of the loan with some borrowers 'overpaying' to reduce negative equity. The regulations recognise the difficulties in moving for borrowers in negative equity by exempting them fully from the LTV limit. However, the cohort with marginal equity is subject to the full extent of the mover limit of 80%.

We believe that there is merit in considering an adjustment to the regulations for this cohort who are trading up to a larger property. This would bring a number of benefits to the overall housing market including:

- Increase the overall supply of property for sale which has been declining in recent years
- Provide a supply of 'starter homes' to meet the needs of First Time Buyer
- Develop a more normalised housing market with a wider choice of properties along with more diverse buyer cohorts

The average age of a STB is also increasing, thereby impacting on affordability for this cohort while many have also seen an increase in income in recent years. We are also cognisant of those STBs who have managed to eliminate their negative equity by meeting or perhaps exceeding their mortgage repayments but who remain 'trapped' as they have LTVs in excess of 90% as a result of the downturn in property prices.

5. Operations

In this section of our submission we are focusing on issues which have been identified by lenders and where we believe there are opportunities to streamline the process improving the effectiveness of the regulations for all stakeholders.

a) Operation of the requirements

The key objective for lenders in relation to the CBI Macro Prudential Measures is to stay within the exemptions for loans drawn down in the reporting period. Any breach of the limits would result in sanctions on the lender and this is clearly a situation that all our members do not wish to countenance in managing their business. The challenge for lenders in meeting this requirement is in managing the flow of applications, approvals and drawdowns in order to ensure the final outcome is always within the limits set by the CBI.

Therefore in considering the operation of the mortgage drawdown limit, Lenders must also take into consideration the flow of activity from the application stage through to loan sanctions. Lenders review mortgage applications in accordance with the credit underwriting assessment criteria set out by their internal policy, the European Union (Consumer Mortgage Credit Agreements) Regulations and in line with the CBI macro prudential measures. The borrower may apply to some or all lenders active in the market and receive an approval from more than one or perhaps all. Predicting customer behaviour is the most challenging to manage from an operational perspective.

However, when it comes to drawing down the loan there are a number of variables which can influence the outcome, most of which are in the hands of the applicant. These include the timing of the drawdown, with each transaction differing, and the choice of lender with which to proceed. There may also be some adjustments to the amount requested in the initial application and the final amount drawn down.

As a result, lenders have no control over which loans will be drawn down from among those approved and need to manage both the level and timing of approvals to allow some scope for adjustment. An element of conservatism needs to be built into the percentage of exceptions which a lender can approve. As BPFI members have zero tolerance for any breach in the regulations, management of the limits can impact negatively on borrowers.

Our suggestion is that the CBI should include a small level of tolerance, on a rolling basis, within the current limits to allow for a smooth operation of the regulations with less seasonal impact on the housing market. For example, if an Institution reported Owner Occupier LTV exception at 16%; they would then be required to return at 14% in this category the following year. This ‘safety’ tolerance level would enable lenders to manage the flow of approvals through to drawdown in a more measured way and still ensure that over a three year timeframe the objectives of the CBI are fully met.

b) Data requirements

The scope of the data submission which each lender must complete is particularly broad and includes many data fields which are unrelated to the Regulations. In the interests of a proportionate approach to data returns we propose that all of the data requirements should be linked to the specific requirements of the Housing Loan Requirements regulations. As examples we suggest that gender, marital status, interest rate, NACE codes etc. are not relevant to the oversight of Macro Prudential Measures and could be removed.

The positive result of this more proportionate approach would mean that fields that are included for background information would then be excluded, leading to a more manageable and efficient data collection and validation process. This would also help to focus the CBI review of the data return process on those key aspects of the data set.

Appendix

An empirical assessment of macroprudential measures in the Irish housing and credit markets.

David Duffy, Daniel Foley, Kieran McQuinn and Niall McInerney.

Economic and Social Research Institute, July 2016

Abstract

In this paper, existing models of the Irish housing and credit sectors are used to evaluate the impact of the macroprudential measures recently introduced by the Central Bank of Ireland on the domestic residential market. A large scale model is used to quantify the impact the measures have had to date on headline housing variables such as prices, supply and the level of credit extended. In addition, the impact of the macroprudential measures on the tenure choice of Irish households is also assessed through use of the user cost of capital concept.

Introduction

This paper empirically assesses the impact of the macroprudential measures recently implemented by the Central Bank of Ireland on the credit and housing markets in Ireland. The paper has two distinct components. The first uses an existing model of the overall Irish housing and banking sectors (Gerlach-Kristen and McInerney. (2014), Duffy, McQuinn and McInerney (2016)) to examine how the macroprudential measures have impacted on key housing variables such as prices, supply and credit levels over the period the measures have been implemented. The second part of the paper also draws on existing ESRI research to examine a more specific question. Namely; how the measures have impacted on the relative costs of tenure and how this affects households' tenure choice. This latter issue is important as most of the analysis undertaken of the macroprudential measures tends to focus on headline housing indicators, however, there are, as our analysis will show, significant effects of the macroprudential measures on other key housing issues.

The paper is structured as follows. We first construct a scenario whereby we look at the effects of the Loan to Value (LTV) and Loan to Income (LTI) restrictions relative to a baseline scenario on the housing and credit markets with respect to mortgage credit, house prices and housing supply. Under the baseline scenario, the measures are assumed not to have been implemented. Therefore, by comparing the outcomes for the different housing variables under the two scenarios, the relative impact of the measures can be gauged.

Next, we provide a brief explanation of the real user costs of tenure and then discuss how the tenure choice of households can be inferred from the absolute difference between real user costs and average rents. Finally, we extend this into a more formal econometric assessment and explicitly model the impact of a specific macroprudential policy measure on tenure choice using user costs as well as the Loan to Value (LTV) ratio.

Results Overview

We begin by examining the performance of the housing and credit markets against simulated results from the ESRI's housing and credit model. In particular we want to analyse how two macroprudential policy restrictions, the LTV and LTI ratios affected the credit and housing markets after their introduction. To do this, we construct two different scenarios and compare them to the actual outcomes observed over the period. We first look at what would have happened to mortgage credit, house prices and housing supply with no change in Loan-to-Value and Loan-to-Income ratios and on the basis of this, how much of the actual change in mortgage credit, etc. can be attributed to these mortgage restrictions.

The results from our scenarios suggest that the impact of the mortgage restrictions only began to take hold in the second half of 2015 and early 2016 as the weighted average of LTVs and LTIs started to fall. The results suggest that the LTV has become the more binding restriction of the two in the most recent period. By 2016 Q1 the combined effect of the LTV and LTI restrictions has been to reduce new mortgage credit by approximately 10 percent relative to the baseline of no change in the ratios. The effect on the housing market is as yet quite muted with house prices being only approximately 0.05 percent lower than in the baseline as at 2016 Q1. The results also show that the effect of the macroprudential rules on housing supply has been effectively zero at this point but this is not surprising given the lags involved in construction.

We next conduct an analysis on the potential longer term impact on housing supply of the macroprudential policies and find that the full effects of the restrictions are not manifested until 3-4 years after the changes. Overall, the analysis suggests that over the longer term that new mortgage credit is 15 percent lower in each quarter relative to a baseline of no changes in the LTV or LTI leading to a mortgage stock that is 8 percent lower. This decline in mortgage credit generates a decline in house prices that are approximately 3.5 percent lower relative in the long-term relative to the baseline. As this simulation holds all of the model's exogenous variables apart from the LTV and LTI ratios constant, the decline in house prices lowers the profitability of housing construction. The number of housing units completed in each quarter is approximately 5 percent lower relative to the baseline by the end of the simulation period resulting in a housing stock that is 0.5 percent lower.

In discussing the user cost of housing we analyse how the movements in affordability affect tenure choice. In particular we examine the extent to which tenure choice can be explained by the absolute difference between user costs and average rents. Ordinarily, one would expect that if the absolute value of user costs is greater than average rents then renting would be more affordable and we would see a preference for renting over buying. Post-crisis we find that there is a significant positive difference between user costs and average rents indicating that owning a home is more expensive than renting and so the tenure choice has moved toward renting.

We then apply a more formal econometric approach and examine the impact of the LTV ratio on the tenure choice of households. We regress the log of the price to rent ratio on the constructed user cost variable mentioned above and augment the regression to include the LTV ratio. We find a significant and negative relationship between real user costs and the price to rent ratio indicating that as real user costs rise there is a movement of preferences towards renting. We also find that there is a significant and positive relationship between the macroprudential Policy tool (LTV ratio) and the house price to rent ratio. This implies that as credit standards become looser i.e. the loan to value ratio increases, there is an increase in the price to rent ratio as demand for owning increases leading to higher house prices. We conduct a policy simulation scenario whereby we look at the effect of a shock to the LTV variable on the price to rent ratio over time and find that a positive shock causes a permanent increase in the house price to rent ratio over time with most of the adjustment occurring within 10 quarters. The simulation indicates that as credit standards become looser there is a movement in tenure choice towards buying a home over renting. This effect is symmetric with a negative shock i.e. a tightening of credit standards having the opposite effect and changing the tenure preference towards renting over buying.

Macroprudential Policy Scenarios using ESRI credit Model

Model Description

The housing and credit model (Gerlach-Kristen and McInerney. (2014), Duffy, et al. (2016)) can be considered in two blocks which consist of housing demand and supply equations, as well as equations for mortgage and housing stock accumulation.

Macroprudential policy enters the model as restrictions on mortgage demand through changes in the LTI and LTV ratios. Cyclical influences on these ratios are first removed so that they purely reflect exogenous (to the model) changes in credit conditions, similar to those that result from a macroprudential policy maker (see Duca et al, 2011; Duffy et al, 2016). These ratios, together with house prices, income levels and interest rates determine the volume of new mortgage lending in the model.

We assume that the Irish mortgage market is monopolistically competitive so that mortgage supply can be modelled as banks setting mortgage rates as a variable mark-up over deposit and money market funding costs.[3] This mark-up mainly reflects both macroeconomic and household-specific risks which are approximated by the unemployment rate and housing equity, respectively.

In terms of housing demand, we adopt the standard inverted demand for housing framework which relates house prices to income levels, demographics, the user cost of capital and a proxy for the demand for housing services. One of the innovations in Duffy et al (2016) in terms of modelling Irish house prices, was the inclusion, following international research such as Duca et al (2011), of an additional demand shifter in the inverted demand function related to credit conditions. These studies are typically single equation reduced-form models which simply include an indicator of credit conditions, such as an LTV that is adjusted so that it purely reflects changes in credit supply. However, the key innovation in Duffy et al (2016), as described above, is to build a structural model so that exogenous changes in credit conditions affect mortgage volumes directly so that credit conditions are endogenous in the

[3] Our identifying assumption is therefore that loan quantities do not enter the mortgage supply equation. The representative interest rate used in the model is the standard variable rate (SVR).

house price equation through the inclusion of the ratio of the mortgage stock to disposable income.

Housing supply is modelled in terms of the completion of new housing units which are mainly determined by the profitability of housing investment (the ratio of house prices to building costs), similar to a Tobin's Q approach to investment (Poterba, 1984). Housing supply is also influenced by the availability and cost of construction credit as well as other variables such as the corporate insolvency rate and output gap which can capture uncertainty about investing.[4]

Finally, the model contains two equations reflecting stock accumulation, similar to the perpetual inventory method. In particular, the housing stock evolves by accumulating the contemporaneous level of housing completions on to the depreciated stock from the previous period (assuming a quarterly depreciation rate of 0.5%). Similarly, the mortgage stock accumulates new mortgage lending on to the previous periods mortgage stock at a rate that is estimated from the data.

We estimate the model over the period 1988Q1 -2014Q4 so that our sample ends in the quarter prior to the mortgage restrictions being introduced. Tables 1a and 1b present the model's parameters.

In terms of mortgage demand, changes in income levels and interest rates (the affordability channel) and house prices (the collateral channel) have a significant impact on the quantity of new mortgage lending. In addition, credit conditions, which relax the affordability and leverage constraints facing households, are also important. The results suggest that a given percentage change in the LTV ratio has almost twice the impact on mortgage demand as a similar percentage change in the LTI ratio. This suggests that the LTV ratio is the more binding constraint facing Irish mortgages, at least over this sample period (1988-2014).

On the mortgage supply, side, funding costs clearly have an important role in how Irish banks set their mortgage interest rates. Moreover, the pass-through relationship is quite strong in both the short- and long-run with almost 80 percent of any change in the money market rate feeding into mortgage interest rates in the long-run. The results also indicate that repayment and default risk, as proxied by the unemployment rate and household equity, respectively, are important determinants

[4] For example, an increase in uncertainty creates a mean-preserving widening of the perceived distribution of future house prices and therefore raises the real option value of postponing housing investment.

of the mortgage interest rate spread. Importantly, from a macroprudential policy perspective, restrictions on the LTV ratios associated with new mortgage lending, will affect the mortgage interest rate through the household equity channel, as the leverage of the marginal mortgage will be lower.

On the housing side, Table 1b shows that the traditional determinants of house prices such as income levels, demographics and the user cost of capital all play an important role in Irish house prices. For example, the long-run elasticity of house prices with respect to income is 0.87, which is consistent with both the Irish and international house price literature. We also find that our indicator of credit conditions in the housing market, given by the mortgage stock to income ratio, is also important, with a long run elasticity of 0.45. Short-run house price dynamics are primarily driven by own-shocks and changes in the unemployment rate.

Table 1b also presents the estimates for the housing supply component of the model. The completion of new housing units is mainly determined by the profitability of housing construction, given by the ratio of house prices to building costs. In addition, there is evidence of credit channels working via both the price and quantity of construction credit. Finally, the model's indicators of uncertainty, as approximated by the output gap and the corporate insolvency rate, suggest that the macroeconomic variables play an important role in housing construction via channels other than house prices and building costs.

As mentioned, the model adopts a perpetual inventory method in modelling both housing and mortgage stocks. The rate of depreciation on the existing housing stock is assumed to be 2 per cent per annum which is consistent with the rate assumed by the CSO. The relationship between the mortgage stock in the current and previous period is estimated from the data and takes a value of 0.985 over the sample period.

Table 1a: Demand and Supply in the Irish Mortgage Market

Mortgage Demand		Mortgage Supply	
	$NewMortgages_t$		$\Delta MorRate_t$
$NewMortgages_{t-1}$	0.746	$MorRate_{t-1}$	-0.359
	(13.1)		(-7.1)
$RMorRate_t$	-0.026	$HHEquity_{t-1}$	-0.326
	(-2.9)		(-3.2)
$\Delta Income_t$	0.891	$URate_{t-1}$	0.306
	(2.1)		(5.9)
$\Delta HPrices_{t-1}$	0.678	$DepRate_{t-1}$	0.079
	(3.1)		(3.9)
LTV_t	0.728	$MMRate_{t-1}$	0.279
	(2.5)		(15.9)
LTI_t	0.392	LTD_{t-1}	-0.526
	(2.8)		(-5.9)
Constant	5.511	$\Delta MMRate_t$	0.519
	(4.5)		(13.1)
		$\Delta DepRate_{t-1}$	0.111
			(2.8)
		Constant	-0.034
			(-1.6)
Adj. R^2	0.949	Adj. R^2	0.884
Sample	1988q1-2014q4	Sample	1988q1-2014q4

Table 1b: Demand and Supply in the Irish Housing Market

Housing Demand		Housing Supply	
	$\Delta HPrices$		$HCompl_t$
$HPrices_{t-1}$	-0.102	$Hcompl_{t-1}$	0.851
	(-2.9)		(15.3)
$(HStock_{t-1}/Pop2534_{t-1})$	-0.075	$HPrices_t/BCosts_t$	0.224
	(-7.2)		(2.1)
$User_{t-1}$	-0.002	$\Delta RNFC_t$	-0.014
	(-9.8)		(-2.5)
$Income_{t-1}$	0.087	$Insolr_t$	-0.014
	(5.6)		(-2.9)
$(MorStock_{t-1}/Income_{t-1})$	0.045	$\Delta CLoans_{t-1}$	0.915
	(6.5)		(4.4)
$\Delta HPrices_{\tau-1}$	0.415	Gap_{t-1}	-1.237
	(4.4)		(-2.4)
$\Delta Prices_{-2}$	0.213	*Constant*	-0.188
	(3.0)		(-0.6)
$\Delta URate_{\tau-1}$	-0.015		
	(-4.2)		
Constant	0.002		
	(1.6)		
Adj. R^2	0.713	Adj. R^2	0.979
Sample	1988q1-2014q4	Sample	1988q1-2014q4

Data

We first calculate the change in the weighted-average LTV and LTI using data from the BPFI. Data on the distribution of new lending by loan-to-value ratios is not available so we use the loan-to-price (LTP) ratio instead. Table 2 shows the distribution of lending for certain ranges of LTI and LTP ratios and the calculated weighted-average for each ratio.

Table 2: Distribution of new lending by LTI and LTP

CustomerType	LTP Range	2014 Q4	2015 Q1	2015 Q2	2015 Q3	2015 Q4	2016 Q1
FTB	<=70%	15.04%	15.46%	13.76%	15.94%	17.12%	18.67%
	>70<=80%	15.79%	14.52%	16.79%	20.12%	20.97%	22.08%
	>80<=85%	7.45%	7.64%	7.02%	8.49%	9.74%	9.83%
	>85%<=90%	34.72%	31.71%	35.49%	37.73%	38.88%	37.84%
	>90%	27.01%	30.67%	26.94%	17.71%	13.28%	11.59%
	W. Avg LTP	86.39	86.61	86.56	85.26	84.66	84.15
CustomerType	**LTI Range**	**2014 Q4**	**2015 Q1**	**2015 Q2**	**2015 Q3**	**2015 Q4**	**2016 Q1**
FTB	<=2.5	29.51%	28.11%	28.08%	27.69%	29.82%	28.52%
	>2.5 <= 3.0	22.10%	20.47%	22.81%	22.85%	23.08%	22.60%
	>3.0 <= 3.5	21.26%	21.98%	21.33%	24.96%	28.26%	34.36%
	>3.5 <= 4.0	16.39%	18.39%	17.32%	16.18%	11.49%	9.29%
	>4.0	10.74%	11.06%	10.45%	8.32%	7.35%	5.23%
	W. Avg LTI	3.28	3.32	3.30	3.27	3.22	3.20

Source: **BPFI**

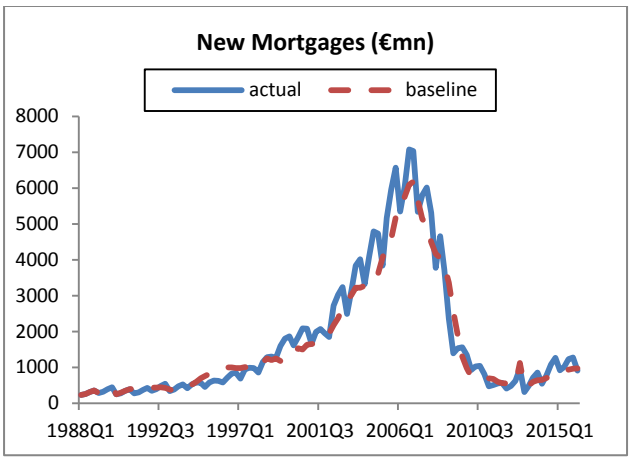
Model Solution

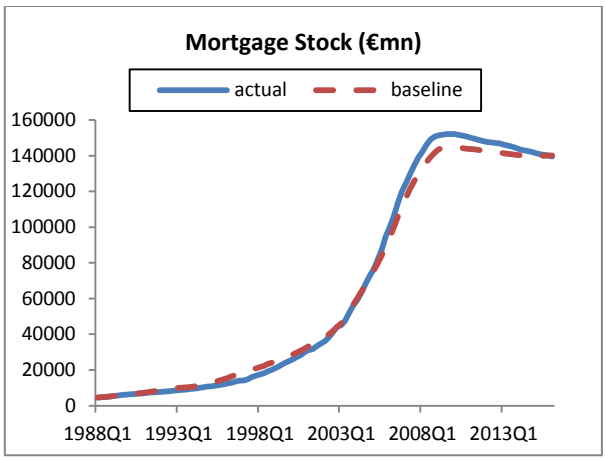
We solve the model up to the most recent period for which all data are available which is 2016Q1 using the coefficients that are estimated up to 2014Q4. The 2016 Q1 data for consumer expenditure deflator, real and nominal GDP and personal disposable income are forecasts taken from the ESRI's *Quarterly Economic Commentary.*

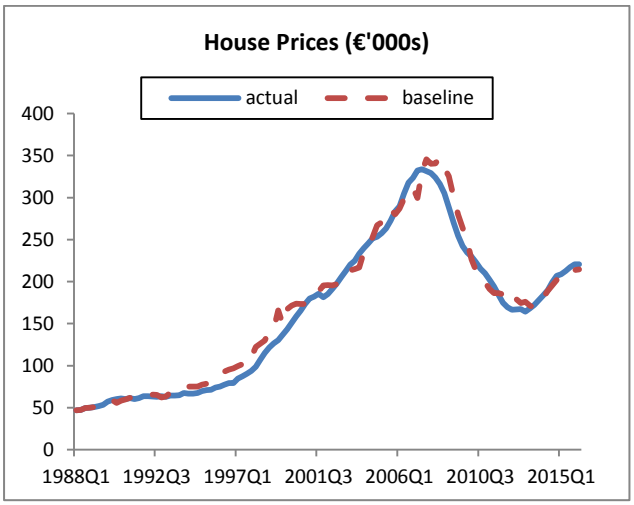
Figure 1 graphs the dynamic solution of the model for each variable against the actual values of those variables. The results suggest that the model closely replicates that actual outturn of the variables over the entire sample period, although there are short periods of deviations, particularly for housing supply. Overall, however, the solution suggests that the model's parameters have been stable over the period.

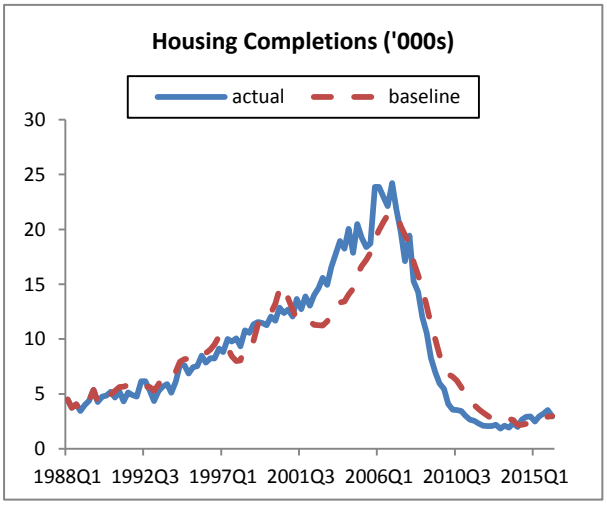
The solution of the model gives us a baseline against which we can analyse the contribution of the changes in the LTV and LTI to the changes in the model's endogenous variables: the volume of new mortgage lending, the total stock of mortgage lending, the standard variable mortgage rate, average house prices, housing completions and the housing stock.

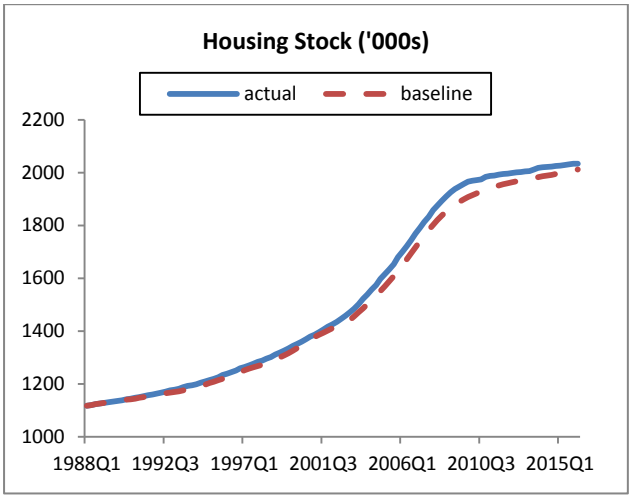
Figure 1: Actual and Predicted values for Mortgage and Housing Market variables

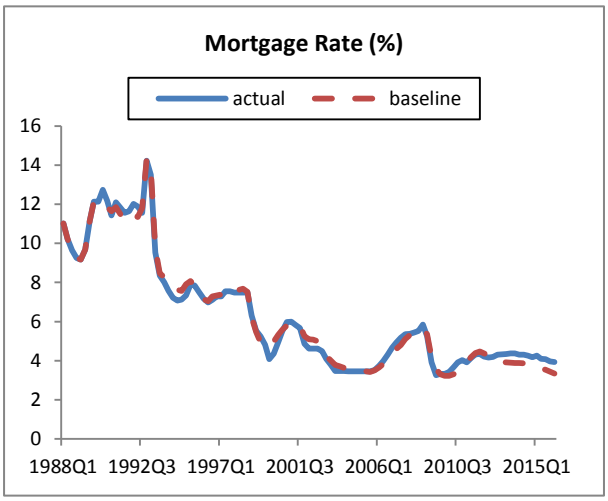












We now conduct our scenario analysis. We investigate 3 possible scenarios. We simulate the model over the 2014 Q4 to 2016 Q1 periods holding the LTI constant at its 2014 Q4. A comparison of the results of this scenario against our baseline allows us to determine how much of the change in the mortgage and housing variables can be attributed to changes in the LTI alone. We then conduct a similar scenario analysis for the LTV ratio by holding it constant at its 2014 Q4 value. Our final scenario keeps both the LTI and LTV ratio constant at their 2014 Q4 values and allows us to estimate how much of the change in mortgage volumes and interest rates, house prices and housing supply can be attributed to the total change in credit conditions given by the change in both the LTI and LTV. As the model is essentially linear, we would expect the combined effect of the LTV and LTI to be a simple addition of their individual impacts.

Figure 2 presents the results of these scenarios. The weighted-average LTV and LTIs actually increased in the first two quarters of 2015 relative to 2014 Q4 and therefore

mortgage volumes and house prices actually rose relative to the baseline of no change in the LTV and LTI ratios. One explanation for this is that mortgages succeeded in getting approval for high LTV and LTI loans during the consultation process prior to the macroprudential restrictions being introduced. These restrictions only affected new drawdowns and not that which had already been approved and therefore we see a "bunching" of lending at the beginning of 2015.

The main driver of the higher mortgage lending (and resultant house prices) relative to the baseline was the changes in the Loan-to-Income ratio. The overall effect, however, was quite weak with the combined effect of the changes in the LTI and LTV only raising new mortgage lending by 2 percent and house prices by 0.01 percent relative to the baseline.

However, the impact of the mortgage restrictions appears to have taken hold in the second half of 2015 and early 2016 as the weighted-average LTIs and LTVs have started to fall. In particular, the results suggest that the LTV has become the slightly more binding restriction in the more recent period. By 2016 Q1 the combined effect of the LTV and LTI restrictions has been to reduce new mortgage drawdowns by approximately 10 percent relative to the baseline of no change in the ratios. The effect on the housing market is as yet quite muted with house prices being only approximately 0.05 percent lower than in the baseline as at 2016 Q1.

Figure 2 also shows that the effect of the macroprudential rules on housing supply is approximately zero. This is unsurprising given the lags involved in construction. We explore this issue further in the next section and also discuss the likely longer term impact of the rules if we extrapolate from the current values of the LTI and LTV ratios.

Figure 2: Assessing the impact of actual changes in LTI and LTV on Housing and Mortgage Market

Assessing the future impact on housing supply

The simulation results above clearly illustrate that short-run response of housing supply to changes in house prices is quite weak. This is partly because our model measures the response of housing *completions* to house prices and therefore, given the lags involved in site purchase and construction, the impact on house prices is likely to be distributed over several years. Indeed, Duffy et al (2016) find the impact of changes in LTV and LTI ratios on housing completions only peaks after 3-4 years.

To illustrate this point we now consider the longer impact on housing supply by assuming that the values of the LTV and LTI ratios at Q1 2016 are the steady-state or equilibrium ratios under the new macroprudential rules and, therefore, that the short-run volatility in these ratios caused by banks granting new mortgages before the rules took full effect has now subsided. As a result, we simulate a scenario (using historical data) in which the first five periods reflect the recent actual changes in the

LTV and LTI (those that prevailed in the 2015Q1-2016Q1 period) and that in subsequent periods these ratios remain constant at their values in the fifth (2016 Q1) period.

Figure 3 illustrates the longer term impact of the mortgage rules over if we assume that the LTV and LTI remain at their 2016Q1 values for periods (quarters) t+5 to t+24 (t+22 for the mortgage stock and new mortgage credit). It is clear that the full effects of the changes in the LTV and LTI ratios are not manifested until 3-4 years after the changes. In this respect, our results suggest that over the longer-term new mortgage credit is 15 percent lower in each quarter relative to a baseline of now with changes in the LTV or LTI leading to a mortgage stock that is 8 percent lower. This decline in mortgage lending generates a decline in house prices that are approximately 3.5 percent lower in the long-term relative to the baseline.

As this simulation holds all of the model's exogenous variables apart from the LTV and LTI ratios constant, the decline in house prices lowers the profitability of housing construction. The number of housing units completed in each quarter is approximately 5 percent lower relative to the baseline by the end of the simulation period resulting in a housing stock that is 0.5 percent lower.

Figure 3 also illustrates the impact on the mortgage rate. The decline in house leverage as a consequence of the lower LTV ratio (and corresponding relative increase in housing equity) leads banks to lower the mortgage rate as the riskiness associated with mortgage lending is now less than under the baseline. However, it is clear that this effect is quite weak.

This scenario analysis also allows us to assess the relative importance of the changes in the LTV and LTI on the future evolution of the mortgage and housing markets. If we assume that the most recent values for the LTI and LTV ratios reflect their steady-state values under the new macroprudential regime, then approximately 2/3 of the long-term decline in mortgage drawdowns, house prices and housing supply would be due to the behaviour of the LTV ratio. This suggests that this ratio is the slightly more binding restriction in the Irish case.

Figure 3: Longer-term Impact of Mortgage Rules

The User Cost of Housing

As a concept, the user cost of capital compares the cost of accessing a given bundle of housing services via homeownership rather than renting in the private market. All the cost outlays of home ownership incurred each period can be brought together in the user cost concept. The measure includes the usual out-of-pocket costs-mortgage interest, maintenance and repair costs, insurance costs, and property tax, but also includes costs to the consumer that are not seen in monetary transactions, such as the opportunity costs of the owner's equity in the house and depreciation. Increases in house prices, resulting in capital gain is also included. By adding costs that are not out of pocket and adjusting for taxation, the user cost concept provides a measure of the real cost of owning a home and emphasizes the investment dimension of

homeownership. Byrne et al (2014) examine how movements in affordability affect the tenure choice, by considering the extent to which tenure choice can be explained by the difference between the user cost of housing and average rents. The user cost measure incorporates taxation, depreciation, mortgage costs and price expectations. Including price expectations means that the expected user cost of housing can be negative, reflecting an expected capital gain.

The user cost of housing expresses the notional cost to an individual from the "housing services" provided by owning a dwelling.[5] The user cost of housing is given by the following formula which aims to capture the costs, and any offsetting benefits, from homeownership.

$$\text{User Cost of Housing} = [(\boldsymbol{\alpha i_b} + (\mathbf{1}-\boldsymbol{\alpha})\mathbf{i_m})(\mathbf{1}-\boldsymbol{\tau}) + \boldsymbol{\delta} - \boldsymbol{\pi}^{\mathbf{e}}_{\mathbf{h}}] * \mathbf{P_H} \qquad (1)$$

where α is the downpayment as a fraction of the purchase price, i_b is the nominal rate of interest on large deposits, i_m is the nominal rate of interest on mortgages, τ is the marginal tax rate, δ is a depreciation rate, π^e_H is the expected rate of house price change, and P_H is the purchase price of the house. In an Irish context, Barham (2004) gives a detailed account of the variables involved in the construction of the user cost of housing, while Browne, Conefrey and Kennedy (2013) use the concept to characterise Irish house price movements over the period 1980 to 2012. Price expectations are represented as a four-quarter moving average of housing price changes, in other words consumers expectations of future house price changes are based on past experience. Murphy and Muellbauer (1997) provide evidence of this in the UK housing market, Case and Schiller (2003) and Piazzesi and Schneider (2009) show its presence in the US housing market, while Lunn (2011) shows evidence for the Irish housing market. Including price expectations means that the expected user cost of housing can be negative, reflecting an expected capital gain. Haffner and Heylen (2011) calculate a user cost for Flanders and the Netherlands and, using an average of price changes over the preceding five years, find that the expected capital gain plays an important role in the difference between costs faced by homeowners and tenants.

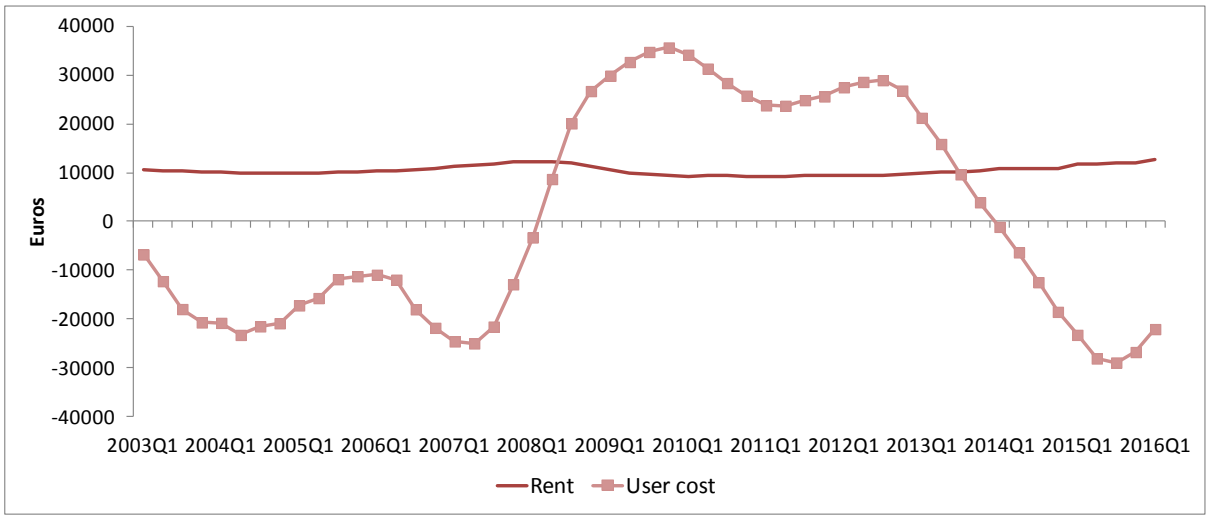
[5] As this is not observable it must be imputed. There is extensive literature on this topic and its calculation. In an Irish context see Roche (1999), Barham (2004), Murphy (2005) Duffy (2011) and Browne, Conefrey and Kennedy (2013).

The absolute difference between the user cost and average rents represents the relative cost of owner-occupation and renting: when rents are greater than the user cost, owner-occupancy is preferred to renting. Post-crisis, rents fell and were exceeded by the user cost, which rose, predominantly due to a shift in price expectations. We, thus, expect to find a positive relationship between renting and the difference between user cost and rents.

Our analysis finds that user cost less average rents, is significant and shows the expected positive sign. Thus, for every age-group, the impact of the relative costs of the tenure choice is as we expect; when owning becomes more costly or renting becomes cheaper, the preference for renting increases. Similarly, the results show that for those under the age of 30 there is the expected negative and significant coefficient on the balance of incentives. These results suggest that the shift from owner-occupation to renting among younger people in Ireland can be explained, in part, by movement in the relative costs of the two tenures.

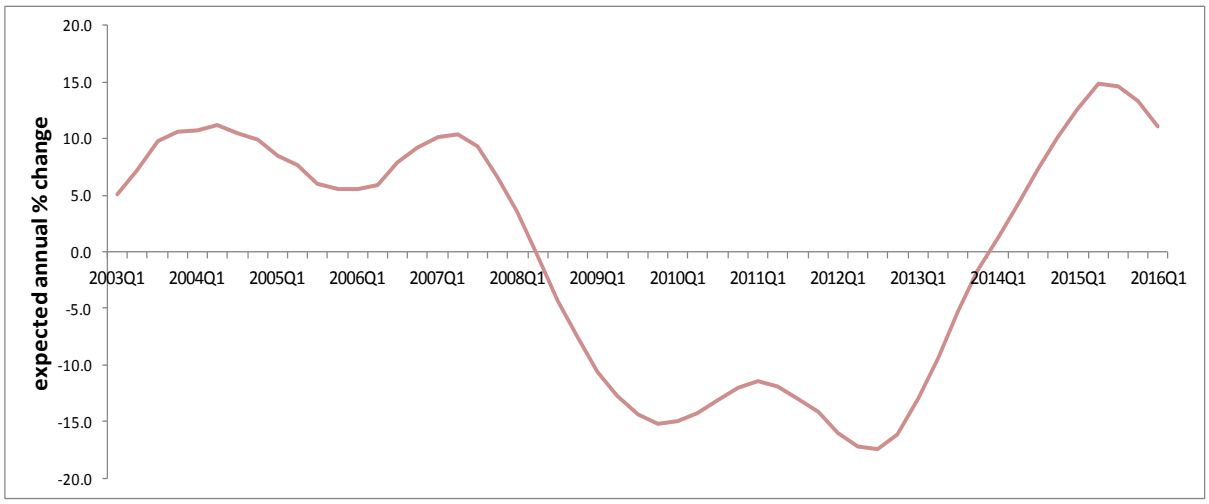
The long-standing preference for owner-occupied housing is likely attributable to the previously-noted incentives offered for owner-occupation and the lack of supply in the rental market, for instance, which meant that owning was more attractive than renting. As shown in Figure 4, the falling user cost from the end 2012 onward, becoming lower than the cost of renting post-quarter 3, 2013 implies a return to demand for owner-occupied housing. What the analysis shows is that after the beginning of 2014 price expectations imply a capital gain from homeownership.

Figure 4 User Cost of Housing and Rents



The user cost estimate shows a decline in the benefit from homeownership in recent quarters. Figure 5 shows expected house price inflation in real terms. As set out above, price expectations are represented as a four-quarter moving average of housing price changes. We can see that expectations have reduced since the second quarter of 2015.

Figure 5 Expected house price appreciation, 4 quarter moving average



Impact of Macroprudential Policy on Tenure Choice

Building on unpublished ESRI research as well as previous work carried out in the US by Duca, Muellbauer and Murphy (2011), we now look at the relative impact of macroprudential rules on the price to rent ratio. The price to rent approach assumes that, absent credit restrictions, arbitrage between owner-occupied and rental housing ensures that the house price to rent ratio depends on the real user cost of capital. However, changes in credit conditions such as the introduction of the macroprudential measures can be seen to impact on the price to rent ratio. In particular, we find that a reduction in the Loan to Value (LTV) ratio, i.e. a tightening of credit conditions, leads to a greater demand for rental accommodation which in turn leads to higher rents for a given price level. Below we discuss our empirical approach before presenting our results.

Empirical Approach

One approach taken in the housing literature is to examine the relationship between the house price to rent ratio and the real user cost. This allows us to look at the relative changes in prices between the two and therefore, provides insight into the tenure choice of household's. In particular the following equation can be posited:

$$\ln\left(\frac{hp_t}{rent_t}\right) = lnRUSER_t$$

(2)

In words, the log of the house price to rent ratio depends on the real user cost of capital, as described in the previous section. To gain an insight into the effects of macroprudential policy, however, we extend the equation to depend on a credit constraint in the same vein as Kim (2007). More specifically, the equation is augmented to include a maximum LTV ratio:

$$\ln\left(\frac{hp_t}{rent_t}\right) = f[(lnRUSER_t), \max LTV]$$

(3)

This suggests that the relationship between house prices and rents can be influenced by changing credit conditions as well as the real user cost. Following on from Duca et al. (2011), we use (3) as the basis for our estimations as it allows us to relate a key macroprudential policy variable to a crucial variable in the housing market. Modelling in this way, allows us to specifically take account of credit frictions in the market on the tenure choice in the Irish market. Note in the model we adjust the actual LTV ratio (ALTV) for demand side factors in the same manner as the Gerlach-Kristen and McInerney (2014), Duffy, et al. (2016) housing and credit model.

We estimate the model based on (3) within an error correction framework using both the Johansen (1998) approach and the autoregressive distributed lag (ARDL) approach (Pesaran and Shin, 1999). Estimating the model using the former approach allows us to calculate orthogonal impulse response functions. In particular, we look

at the effect of a shock in the adjusted LTV variable ($AlLTV_t$) and its consequences on the log of the house price to rent ratio ($\ln\left(\frac{hp_t}{rent_t}\right)$). This exercise allows us to construct a simulation whereby we shock the macroprudential policy variable ($AlLTV_t$)) i.e. a loosening or tightening in macroprudential policy and look at the resulting impact on the house price to rent ratio variable.

Results

Table 3 contains the results from our long run model based on (2). We present results using both the Johansen and ARDL approaches. Two estimates using the ARDL method are shown in the table, with the AIC and Schwartz -Bayesian (SBC) information criterion being used to select respective lag lengths. The equations across all three columns are very similar in magnitude and sign and are broadly in line with Duca et al. (2011). As we might expect, there is a negative coefficient on the real user cost variable indicating that as real user costs rise there tends to be less demand and so the house price to rent ratio decreases. The results also show that there is a positive relationship between the adjusted loan to value ratio and the house price to rent ratio indicating that looser credit standards cause upward pressure on the house price to rent ratio over time.

Table 3 House Price to Rent Model

Dependent Variable:	$\ln\left(\frac{hp_t}{rent_t}\right)$			
Variable		**Johansen**	**ARDL(AIC)**	**ARDL(BIC)**
$Constant$		-2.95	-2.29	-2.26
		(-1.94)	(-2.43)	(-2.41)
$lnRUSER_t$		-0.55	-0.55	-0.54
		(-2.61)	(-3.93)	(-4.00)
$AlLTV_t$		0.73	0.60	0.59
		(3.32)	(3.74)	(3.72)

Note: Standard errors in Parentheses

Table 4 shows the results from our short run model based on a vector error correction model (VECM). We find that the error correction term is negative and significant, indicating that there is 4 per cent correction towards the equilibrium set out in (2) every quarter.

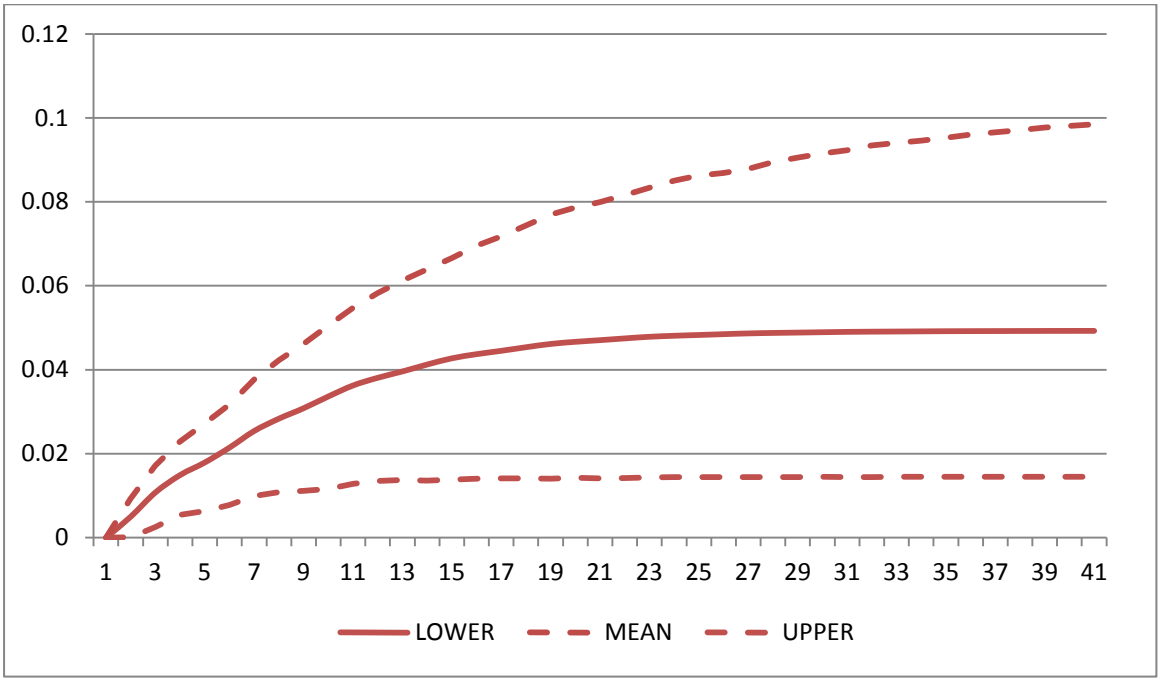
Table 4 Short Run dynamic equation for the change in the house price to rent ratio

Dependent Variable			
Variable		Coefficient	T-stat
$(\Delta l(hp_{t-1}/rent_{t-1}))$		0.24	2.79
$(\Delta lRUSER_{t-1})$		0.01	1.03
$(\Delta ALTV_{t-1})$		-0.01	-0.47
$(\Delta l(hp_{t-2}/rent_{t-2}))$		-0.21	-2.51
$(\Delta lRUSER_{t-2})$		-0.001	-0.12
$(\Delta ALTV_{t-2})$		-3.80E-05	-0.003
$(\Delta l(hp_{t-3}/rent_{t-3}))$		0.16	1.94
$(\Delta lRUSER_{t-3})$		0.002	0.24
$(\Delta ALTV_{t-3})$		0.01	0.57
$(\Delta l(hp_{t-4}/rent_{t-4}))$		0.24	2.99
$(\Delta lRUSER_{t-4})$		0.02	2.35
$(\Delta ALTV_{t-4})$		0.01	0.51
ecm_{t-1}		-0.04	-2.92

Note: Standard errors in Parentheses

Next we conduct our policy simulation exercise where we look at the effect of a shock to credit standards and how that effects the house price to rent ratio over time. We find from figure 6 that a positive shock to $(AlLTV_t)$ which indicates a loosening of credit standards will have a positive impact on the $\ln\left(\frac{hp_t}{rent_t}\right)$ over time, with most of the adjustment occurring within 10 quarters. This implies that a rise in $(AlLTV_t)$ will cause house prices to rise relative to rents as demand for housing increases. Similarly, a decline in $(AlLTV_t)$ such as a tightening of the macroprudential policy rules, will cause rents to rise relative to prices. Significant changes in credit provision due to the introduction of macroprudential policy, therefore, lead to a shift in tenure choice causing a change in the relative value of house prices to rents.

Figure 6 Orthogonalised Impulse Response of the Log of the House Price to Rent Ratio



Note: The solid line represents the impulse response while the dashed lines are the 95 per cent confidence intervals

Concluding Comments

In this report we have analysed the implications for the Irish housing and credit sector of the recent macroprudential measures introduced by the Central Bank of Ireland. While the macro level assessment of the measures implications is limited somewhat by the relatively short period of time for which they have been in place, it is clear that the measures, as noted in Duffy et al. (2016), have had a contractionary impact on lending in the Irish market. This analysis also suggests that housing supply levels are less now than what they otherwise would have been in the absence of the macroprudential measures.

In the report we also examine the implications for tenure choice of the macroprudential measures, mainly through the user of cost of capital concept. Our results indicate that a policy which lowers the effective LTV ratio will lead to a permanent decline in the house price to rent ratio. In other words, lower, binding LTVs result in permanent increases in rents for a given house price level as more people move towards renting rather than owning a home.

This raises an important issue for policy makers to consider. The imposition of a LTV rule, which changes rents relative to house purchase prices, ultimately reflects a change in the tenure preferences of households. An increase in the proportion of people renting in the economy has implications for the nature of the housing stock to be constructed. This warrants attention at a time in the Irish market when a number of policy considerations are being considered to stimulate housing supply. For example, Lyons (2015) suggests that building regulations should be amended to facilitate greater housing supply. However, this may reduce the appropriateness of the new housing stock to meet the changing tenure requirements.

References

Byrne, D., D. Duffy and J. FitzGerald, (2014), Household Formation and Tenure Choice: Did the great Irish housing bust alter consumer behaviour? , ESRI Working Paper 487, July .

Barham, G., (2004) "The Effects of Taxation Policy on the Cost of Capital in Housing – A Historical Profile (1976-2003)", Central Bank Financial Stability Report.

Browne, F., T. Conefrey and G. Kennedy (2013), Understanding Irish house price movements – a user cost of capital approach, Central Bank of Ireland Research Technical Paper 04/RT/13.

Case, K.E. and Schiller, R.J., (2003) Is there a Bubble in the Housing Market? Brookings Papers on Economic Activity 2003, 299-342.

Cussen, M., M. O'Brien, L. Onorante and G. O'Reilly, (2015), "Assessing the impact of macroprudential measures", Central Bank of Ireland, Economic Letter, No. 3.

Duca,J..Muellbauer,J., and Murphy,A. (2011). House prices and credit conditions: Making sense of the U.S. experience. Economic Journal, Royal Economic Society

Duffy,D., (2011) User Cost and Irish House Prices, Special Article in Quarterly Economic Commentary, ESRI, Autumn.

Duffy, David & Mc Inerney, Niall & McQuinn, Kieran, 2016. "Macroprudential Policy in a Recovering Market: Too Much too Soon?" *International Journal of Housing Policy* (accepted).

Gerlach-Kristen, P., and N. McInerney. (2014). The role of credit in the housing market, ESRI Working Paper no. 495. ESRI: Dublin.

Haffner, M., and K. Heylen, (2011), User Costs and Housing Expenses. Towards a more comprehensive approach to affordability, Housing Studies, Vol. 26, Issue 4.

Hendry, D.F. (1993). *Econometrics: Alchemy or science?* Oxford: Blackwell publishers.

Johansen, S. (1998). Statistical Analysis of cointegrating vectors. *Journal of Economic and Dynamics and Control,* 12, 231-254.

Kim,Y. (2007). Rent-price ratios and the earnings yield on housing. In unpublished manuscript, University of Southern California.

Lunn, P., 2011, "The Role of Decision-Making Biases in Ireland's Banking Crisis" ESRI Working Paper No. 839, May.

Lyons, R. (2015). *Daft.ie house price report, October*. Available online at https://www.daft.ie/report/ronan-lyons-2015q3-sale

McCarthy, Y., & McQuinn, K. (2013). Credit Conditions in a boom and bust property market. *Central Bank of Ireland Research Technical Paper* 8/RT/13.

Murphy, A., (2005) Modelling Irish house prices: A review and some new results. Nuffield College Oxford. mimeo.

Murphy, A, and Muellbauer, J., 1997, "Booms and Busts in the UK Housing Market", The Economic Journal, 107, November.

Pesaran, M.H., & Shin, Y. (1999). An autoregressive distributed lag modelling approach to cointegration analysis. In S Storm (Ed.), *Econometrics and economic theory in the 20th century: The Ragner Frisch centennial symposium, chapter 11* (pp. 371-413). Cambridge: Cambridge University Press.

Piazzesi, M., and M. Schneider, 2009, Momentum Traders in the Housing Market: Survey Evidence and a Search Model, American Economic Review: Papers and Proceedings 99:2.

Roche, M., 1999, "Irish House Prices: Will the Roof Cave in? The Economic and Social Review, Vol.30, No.4, October.

Poterba, James M. 1984. "Tax Subsidies to Owner-occupied Housing: An Asset Market Approach." Quarterly Journal of Economics 99: 729-52.