The housing market: the impact of macroprudential measures in France

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The housing market is a central macroprudential policy concern in France due to the significant proportion of residential property loans in bank balance sheets and the high weight of housing in household wealth. The surge in house prices at the start of the 2000s means we cannot rule out the risk of a bubble or a sharp downward correction, even though prices currently seem to be stabilising. However, if the evolution of house prices does start to pose a threat to financial stability, French authorities have access to a number of macroprudential tools that can be used to modify trends in factors such as the provision of housing loans. Using a model, this article attempts to examine the impact of measures which directly or indirectly influence loan interest rates and maturities, or the size of repayments in relation to household income. The empirical results show that these measures have a significant impact on trends in home lending, but a more limited impact on house prices due to the way variations in lending affect housing supply.

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Past experience of booms and busts in house prices and their effect on the banking system (Glaeser, 2013) shows how important the supervision of the housing market is to financial stability. Macroprudential policies play a key role in this supervision. As a result, the European Capital Requirements Directive CRD IV and the French Banking Law of 2013 have introduced macroprudential tools specifically targeted at the property sector, notably sectoral capital instruments and constraints on lending criteria.

In France, the construction sector accounted for 6.3% of value added (in value terms) and 8.3% of jobs in 2012. Households spent an average 24% of their gross disposable income on housing over the period (*Institut de l'épargne immobilière et foncière* – IEIF, 2013), while 48% of their gross wealth was invested in real estate (Arrondel, Roger and Savignac, 2013). Changes in the housing market can thus have an impact on the French economy, even though their direct influence on household consumption is limited in comparison with other countries (Arrondel *et al.*, 2014).

French banks are primarily exposed to real estate risk through their business of providing housing loans. However, their sensitivity to movements in the housing market depends on the strategies they have in place to secure their lending. More than half the housing loans granted in France are secured with an institutional guarantee (*cautionnement*) rather than a mortgage (*Autorité de contrôle prudentiel et de résolution* – ACPR, 2013). This form of guarantee encourages banks to place greater emphasis on the solvency of the borrower than on the quality of the asset pledged as collateral (the mortgage). In the event of a default by the borrower, the company granting the guarantee reimburses the bank out of a pool of funds and then tries to recover its losses from the borrower. Unlike with mortgages, however, their debt has no seniority status. As a result more attention is paid to the probability of a borrower default, leading to the selection of higher quality loans. French banks thus insist on limiting loan repayments (principal and interest) to 33% of a borrowing households' disposable income. Moreover, the concept of mortgage equity withdrawal is not very widespread in France and the amount that can be provided as a guarantee is restricted to the purchase price of the property and not its market value.[1]

This specific feature of the French housing market raises questions over the most efficient levers for macroprudential housing policy. What are the transmission channels for real estate risk? And how can we act on or control these channels?

It is also important to note that housing policy has always been a key government priority in France, even more so over the two-decade period covered by this study (1993-2013). Various measures have been introduced to try to stimulate housing supply, including income-based assistance to individuals, tax exemption of interest on housing loans, interest-free loans, tax credits for renovation work, social housing quotas and the enforceable right to housing (*droit au logement opposable*).

What are the possible knock-on effects of macroprudential policy tools on the French housing market? Do they conflict with the aims of the government's housing policy? Or can they in fact be useful to that policy?

In this article we propose using a simplified model to analyse the interaction between macroprudential policy and the French housing market. The model allows us to look at the home lending and housing markets in tandem, and thus enables us to assess the responses of prices and quantities in both these markets to different macroeconomic factors – notably those through which macroprudential policy measures are transmitted. We can thus see how measures such as the tightening of loan-to-value (LTV) and debt-to-income (DTI) ratios, and constraints on overall lending growth, loan maturities and down-payments affect the housing market.

The remainder of the article is structured as follows: Part 1 provides a brief summary of the findings of the existing literature on the subject, followed by a detailed presentation of some stylised facts on the French housing and credit markets since the start of the 1990s. Part 2 describes the model and the results of our estimates and provides an analysis of macroprudential shocks. Part 3 puts previous results into perspective.

1 *These mechanisms mean there is no financial accelerator in the French property market. A financial accelerator (Bernanke* et al., *1996) is when an increase in house prices leads to a rise in the provision of housing loans, where the latter are secured against the purchased property via a mortgage lien.*

1| The housing and credit markets: stylised facts

1|1 A brief review of the literature

There are two bodies of literature that examine the links between the housing and credit markets: one that uses structural macroeconomic models, and another that uses the results of actual public policy experience.

In the strand using models, DiPasquale and Wheaton (1994) highlight an adjustment cost effect in the housing market which causes house prices to adjust gradually. They also give a more nuanced assessment than theoretical models of the role played by user cost in investment decisions.[2] McCarthy and Peach (2002) examine the impact of financial deregulation on investment in residential property and assess the scale of the impact of credit constraints on the price and volume of real estate investments. However, the effect of interest rates differs depending on the regulation system adopted.

According to Duca *et al.* (2011), the credit constraints for first-time home buyers play a major role in determining the dynamics of house prices.[3] Indeed, while financial innovation helped to drive the boom years in the housing market, the highly restrictive lending policies adopted by the major banks exacerbated the subsequent downturn. Nobili and Zollino (2012) confirm these findings with respect to the Italian housing market, demonstrating that lending criteria have a significant impact on demand for housing via home lending.

In the strand of literature that evaluates public policy experience, Wong *et al.* (2011) show that the introduction of an LTV ratio cap effectively reduced the systemic risk caused by house price cycles in Hong Kong. According to Igan and Kang (2011), the restrictions imposed on LTV and DTI ratios in Korea slowed the rise in prices and in transaction volumes. Claessens *et al.* (2013) confirm the effectiveness of DTI and LTV ratios in limiting growth in the financial sector during boom periods. Studies carried out on different panels of countries have also demonstrated the efficiency of macroprudential measures. For example, Kuttner and Shim (2013) evaluate the impact on home lending of measures designed to regulate the debt-service-to-income (DSTI) ratio, the LTV ratio, banks' exposure to the housing sector and property taxes. In their view, the DSTI ratio is the most effective tool for influencing housing supply, whereas property taxes are the most effective way of stabilising house prices. Lastly, Lim *et al.* (2011) demonstrate that caps on LTV and DTI ratios, on lending growth, compulsory reserves and dynamic provisioning limit lending procyclicality.

1|2 Housing and credit in France since 1993: some stylised facts

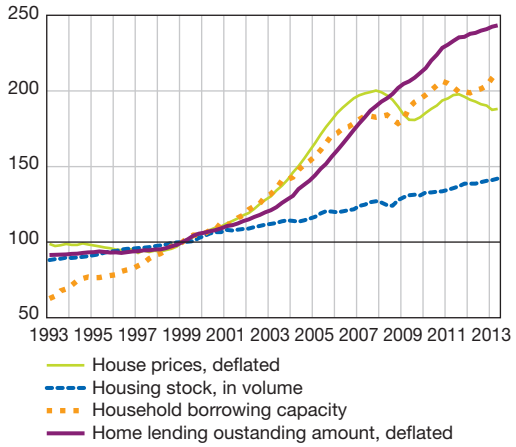
The French housing[4] and credit markets grew sharply in the first half of the 2000s, as in many advanced economies (see Chart 1). However, following the financial crisis, the adjustment in the French housing market was very limited, in that no reversal in the trend can be observed. Antipa and Lecat (2013) show that although house prices began to correct after 2008, in 2012 they were still 20% above the equilibrium price based on traditional fundamentals (i.e. household income, demographic factors, user cost, housing stock, etc.).

The resilience of house prices in France can partly be attributed to the inertia of the housing stock with respect to prices.[5] This observation is confirmed by Caldera Sánchez and Johansson (2011) and by our estimates which show that the responsiveness of housing supply to price changes is low in France due to regulatory barriers to new housing construction.

Demand for housing also rose sharply over the period. Population growth in France accelerated at the start of the 2000s, and the number of households increased at an even faster pace.[6] The combination of this demand shock and the housing stock inertia fuelled a rise in prices.

2 *The user cost is a measure of the opportunity cost of occupying a house.*
3 *Lescure (2013) studies the housing crisis that France experienced as of 1882-1883 and argues that bank failures led to difficulties in the housing market.*
4 *Chart 1 shows an aggregate index of house prices, which does not reflect the location of houses and thus their strong heterogeneity.*
5 *Bulusu* et al. *(2013) demonstrate the importance of supply constraints in house price boom-and-bust cycles in the United States.*
6 *Between 1975 and 2005, the population of France grew by an average of 0.48% per year whereas the number of households rose by 1.24% per year (Insee Première, 2006).*

Chart 1
French housing and credit markets
(Q1 1999 = 100. See Box 1 for definitions and series calculations)



Sources: Banque de France, Insee; authors calculations.

The housing market was also boosted over the period by the relaxation of constraints on demand for loans. This can be likened to a positive housing demand shock which, all other things being equal, can also cause prices to soar.

It should be remembered that the relaxation of these constraints was primarily the result of an improvement in bank refinancing conditions over the period. The drop in bank refinancing rates was passed through to housing loan rates, giving more households access to the lending market or allowing them to increase the amount of their borrowing.

Moreover, some of the constraints on lending were also relaxed. In France, housing loans can be secured either by a mortgage or by an institutional guarantee. The majority of loans are now secured by guarantees (ACPR, 2013). In the event of a default by the borrower, the guarantee company automatically reimburses the lender and then tries to recover its losses from the borrower. This means the bank is reimbursed rapidly and does not have to wait for the property to be sold. In contrast with mortgages, the risk of a fall in the price of the property is transferred to the guarantee company.

Before even protecting themselves against the risk of borrower default, French banks also reduce their exposure by restricting the debt service ratio to 33% of household income. Therefore, although the level of household debt increased over the period under review, it remained contained relative to other, notably "Anglo-Saxon", countries. In hindsight, this can be considered a strong justification for the 33% restriction imposed by French banks. The focus on the debt service ratio substantially reduces banks' risk exposure on their housing loan portfolios.[7] Even though it varies widely across market segments, the ratio of gross non-performing loans for these portfolios is considerably lower than for household loans in general. After peaking at 1.55% in 2001, the non-performing loans (NPL) ratio fell consistently up to 2007 (0.98%), before rising steadily again in the period up to 2012, when it reached 1.47%, close to its 2001 level. The focus on borrower solvency also explains why more than 90% of housing loans in France are fixed rate (ACPR, 2013).

Chart 1 illustrates the importance of this constraint in determining the dynamics of home lending in France. Household borrowing capacity rose almost constantly, decelerating only slightly at the end of the period. Up to 2007, borrowing capacity and home lending remained on almost parallel trajectories.[8]

Banks have been able to continue meeting the 33% debt service ratio thanks to a sharp rise in nominal household income over the period, but also by gradually extending the duration of housing loans. The average initial maturity for housing loans increased from 14 years in 1999 to 20 years (19.8 years) in 2012.[9] Thus, according to Antipa and Lecat (2013), if we take into account the extension of loan maturities, the majority of the rise in house prices can be

7 *In contrast with other countries, in France, if housing loans are securitised via the* Caisse de refinancement de l'Habitat *(CRH), they remain on the balance sheet of the originating bank. The largest French banks are shareholders in the CRH, which is a securitisation vehicle for housing loans. The shareholders pledge a pool of their loans to the CRH which in turn issues debt securities, and then uses the funds it raises to provide loans on similar terms to those of the issued debt securities. However, the loans remain on the banks' balance sheets and the credit risk is not transferred to the CRH, which is not a liquidity vehicle. It is therefore important to control lending criteria adequately.*

8 *In certain sub-periods, the amount of credit exceeds household borrowing capacity, contrary to what we would expect if lending criteria were applied uniformly across the population. Households with low incomes are directly excluded from the housing market. By contrast, a small portion of borrowers are considered to have sufficiently high revenues for banks to exceed the 33% debt service ratio. However, the dynamics of the market are primarily determined by the portion of the population to which the 33% ratio is applied.*

9 *Sources: Banque de France and author's calculations.*

attributed to the borrowing capacity of households and to traditional fundamentals.

As a result, a macroprudential policy comprising limits on the DTI ratio or on the maturity of housing loans could have a lasting effect on the French housing market.

2| Macroprudential policy shocks and the housing market

In order to assess the impact of macroprudential policy shocks, we propose a model that looks at both the French home lending and housing markets over the period 1993-2013 (see Box 1 for a detailed description of the equations). The proposed framework is based on the assumption that the two markets are closely linked. Macroprudential measures primarily target credit supply, but in analysing their impact it is important to take into account the feedback effects between the housing and credit markets. This study adopts a pragmatic approach in that the equations are not derived from the resolution of a sector or agent optimisation programme. However, the relationships between the variables of interest are economically intuitive: the expected correlations are listed in Table 1. Moreover, only the long-run relationships are presented in detail in this article, even though there may be a lag in the adjustment of the housing market (DiPasquale and Wheaton, 1994).

The main theoretical characteristics of the equations in the benchmark model are as follows (see Table 1):

- House prices are a positive function of levels of household income and home lending and a demographic factor, which in this case is the population level. They are negatively linked to housing stock and to the user cost of homeownership. This latter factor reflects changes in the cost of owning a house (net of expected capital gains) and the tax policy on housing.

- The housing stock is a positive function of home lending and house prices, and is negatively linked to long-term interest rates which represent the cost of financing for homebuilders.

- Demand for housing loans reacts negatively to interest rates or to an indicator of lending criteria, which reflects household borrowing capacity, excluding income. This indicator is defined as a combination of interest rates, the maturity of the loan and the maximum share of income that will be used for loan repayments (see Box 1). It is positively correlated with household income and house prices.

- Lastly, interest rates on housing loans are positively correlated with the level of long-term interest rates but negatively correlated with house prices (the house value provides collateral for credit institutions) and bank's capital levels (which reflect their solvency).

Table 1
Expected relationships between variables

Equation	Endogenous variables	Explanatory variables	Expected correlation
Demand for housing	House prices	**Housing stock**	–
		Gross disposable income (GDI)	+
		Home lending	+
		User cost	–
		Population	+
Housing supply	Housing stock	**House prices**	+
		Home lending	+
		10-year OAT	–
Demand for credit	Home lending (Change in oustanding amount)	**Housing loan rates**	–
		House prices	+
		Lending criteria	–
		Gross disposable income (GDI)	+
Credit supply	Housing loan rates	10-year OAT	+
		EONIA	+
		House prices	–
		Ratio of capital to assets	–

Note: Endogenous explanatory variables are indicated in bold.

Box 1

The model

The model comprises 4 equations: a supply and demand equation for both the housing market and the credit market. We use quarterly volume data (deflated by the implicit price of household consumption, except where indicated otherwise) and logs (except for rates). The logs of each variable (except rates) are indicated in small letters. The model reflects long-term behaviours as the housing market can take a long time to adjust.

Housing market

- *Inverted demand* $p_t = \beta_0 + \beta_1 pi_t + \beta_2 crd_t + \beta_3 s_t + \beta_4 uc_t + \beta_5 pop_t + \varepsilon_t^D$

where p_t *is the price of existing property (the Insee data series has been extrapolated backwards using a series from the French association of estate agents or FNAIM);* pi_t *is permanent income, proxied here by gross disposable household income,* crd_t *is the amount of outstanding housing loans,* s_t *is the stock of housing calculated using household wealth data and deflated by the implicit price of residential investment and using residential investment for the quarterly profile,* uc_t *is the user cost and* pop_t *is the population level.*

The user cost reflects the cost of owning a property, which includes the opportunity cost of holding it and any expected future capital gains:

$$UC_t = P_t^n \left(i_t - av_t + tprop_t + \delta_t - \frac{\Delta P_t^e}{P_t} \right)$$

P_t^n *is the level of house prices,* i_t *is the interest rate on housing loans,* av_t *is the rate of public aid granted to house builders (grants and tax breaks),* $tprop_t$ *is the rate of property tax,* δ_t *is the rate of depreciation of housing derived from household wealth data, and* $\frac{\Delta P_t^e}{P_t}$ *is the anticipated increase in house prices estimated as the average house price inflation over the past two years (adaptative forecasts).*

- *Housing supply* $s_t = p_0 + p_1 crd_t + p_2 OAT_t + p_3 p_t + \varepsilon_t^0$

where OAT_t *is the 10-year OAT rate.*

Home lending market

- *Demand for credit* $\Delta crd_t = \sigma_0 + \sigma_1 \Delta pi_{t-1} + \sigma_2 \Delta p_{t-1} + \sigma_3 i_{t-1} + \varepsilon_t^c$

The equation uses variations to take into account the order of integration of the variables.

- *Credit supply: interest rates* $i_t = \theta_0 + \theta_1 OAT_t + \theta_2 p_{t-1} + \theta_3 CAP_t + \varepsilon_t^i$

where CAP *is the banks' ratio of capital to total assets.*

In the credit equations, i_t *and an indicator of lending criteria* $COND_t$ *are used alternately. This latter indicator reflects the borrowing capacity of households, excluding income, based on the combination of the loan maturity, the interest rate and the maximum share of income devoted to loan repayments. We take the inverse to be consistent with the measurement of interest rates.*

$$COND_t = 1/\left[REP \sum_{t=1}^{T} \frac{1}{(1 + i_t)^t} \right]$$

where T *is the average initial maturity of housing loans and* REP *is the maximum share of income devoted to loan repayments (we use 33%, in line with French banks' lending practices).*

The equations are estimated using three-stage least squares. Due to the low number of observations, they were also estimated using ordinary least squares and two-stage least squares. p_t, crd_t *and* s_t *are deemed to be endogenous.*

2|1 Empirical results

The results of our estimates (Table 2) are in line with our expectations. Indeed, in the case of demand for housing, the response in prices is slightly less than proportional to the change in lending volumes; as expected, prices fall when housing stock and user cost rises. The elasticity of prices to household income is spontaneously greater than 1. It was restricted to one with no significant loss in accuracy or explanatory power. The elasticity of prices to population levels is relatively high. This provides a good reflection of the dynamics in household numbers in relation to the total population over the period; it is consistent with the negative elasticity of housing stock.

In the case of housing supply, a 1-point increase in long-term interest rates ultimately lowers the housing stock by close to 2 points. The elasticity of housing stock to house prices is low, which reflects the constraints on housing supply in France as mentioned earlier (Caldera Sánchez and Johansson, 2011).

Regarding demand for credit, the level of interest rates on housing loans has a permanent impact on lending growth, with a 1-point rise in rates leading to a 0.2-point reduction in growth. The impact exerted through the lending criteria indicator is similar in scale. Interest rates on housing loans largely depend on long-term rates. A high level of bank capitalisation enables a reduction in interest rates as it reflects a stronger capacity to incur risk.

To check the robustness of our benchmark model, we also estimated the equations for an alternative model specification where the variables of interest are growth rates. Housing supply is inelastic to house prices, which is normal in a relationship based on variations.

Table 2
Results of the estimations

Period: Q1 1993-Q2 2013	OLS	2SLS	3SLS-Rates	3SLS-Cond.
Housing demand: house prices				
Gross disposable income	1	1	1	1
Home lending	0.847***	0.907***	0.706***	0.689***
	(0.0991)	(0.122)	(0.118)	(0.122)
Housing stock	-2.087***	-2.182***	-2.185***	-2.296***
	(0.261)	(0.322)	(0.327)	(0.339)
User cost	-0.567***	-0.584***	-0.544***	-0.531***
	(0.0327)	(0.0377)	(0.0338)	(0.0350)
Population	4.773**	4.538*	6.663***	7.319***
	(1.957)	(2.430)	(2.401)	(2.485)
Housing supply: housing stock				
Home lending $_{t-1}$	0.240***	0.253***	0.226***	0.226***
	(0.0129)	(0.0166)	(0.0221)	(0.0205)
10-year OAT	-2.386***	-1.741***	-2.028***	-2.083***
	(0.217)	(0.194)	(0.219)	(0.219)
House prices	0.0488***	0.0689***	0.0897***	0.0853***
	(0.0159)	(0.0180)	(0.0247)	(0.0234)
Demand for credit: Δhousing loans				
ΔGross disposable income $_{t-1}$	0.154*	0.151*	0.665**	0.525**
	(0.0828)	(0.0798)	(0.262)	(0.259)
ΔHouse prices $_{t-1}$	0.263***	0.264***	0.303***	0.360***
	(0.0485)	(0.0631)	(0.0628)	(0.0591)
Interest rates on housing loans $_{t-1}$	-0.200***	-0.191***	-0.218***	–
	(0.0285)	(0.0297)	(0.0326)	
Lending criteria $_{t-1}$	–	–	–	-1.062***
				(0.159)
Credit supply: interest rates/lending criteria for housing loans				
10-year OAT	0.882***	0.812***	0.783***	0.0988***
	(0.0785)	(0.0722)	(0.0592)	(0.00916)
House prices $_{t-1}$	-0.0200***	-0.0303***	-0.0239***	-0.00846***
	(0.00375)	(0.00613)	(0.00395)	(0.000612)
Capital to assets	-0.719***	-1.898***	-0.517***	-0.0584***
	(0.0897)	(0.401)	(0.149)	(0.0214)

*Notes : Figures in parentheses are robust standard deviations - * $p \leq 0.1$, ** $p < 0.05$, *** $p < 0.01$.*
All series are deflated and in logs (except rates). A constant is included in each column. Columns 1 to 4: the GDI coefficient is restricted to 1 in the housing demand equation. Columns 1 and 2: the residuals are stationary (augmented Engle-Granger tests). Column 2: the null hypothesis of exogeneity for these tools cannot be rejected by the Sargan-Hansen test.

Table 3
Joint model for housing and credit market
Growth rates

Period: Q1 1993-Q2 2013	OLS	2SLS	3SLS
Housing demand: house prices			
Housing stock	-0.041	-1.273***	-1.156***
Home lending	1.039***	1.059*	1.491***
Housing supply: housing stock			
House prices	-0.034	0.0241***	NS
Home lending $_{t-1}$	0.111	0.0665***	0.126**
Demand for credit: Δhousing loans			
Interest rates	-0.267***	-0.661***	-0.209***
Term of loans $_{t-1}$	0.194***	0.167***	0.159**
Term of loans $_{t-4}$	0.188***	0.0736**	0.149**
Gross disposable income	0.167*	-	0.133*
House prices	0.216***	-	0.313***
Credit supply: interest rates on housing loans			
EONIA	0.993***	-	0.942***
House prices $_{t-4}$	-0.482***	-	-0.525***

*Notes: Figures in parentheses are robust standard deviations - * $p \leq 0.1$, ** $p < 0.05$, *** $p < 0.01$*
All series are deflated and in log (except rates). A constant is included in each column. Housing stock, house prices, home lending, the maturity of housing loans and the GDI are rates of growth. The cost of construction index is a deviation around a deterministic trend.

Housing supply and demand are most responsive to housing credit.[10] The cost of credit is determined by short-term rates and adjusted to an extent by movements in house prices. Demand for credit appears to vary according to the intensity of the constraints on the debt service ratio. Indeed, it rises markedly as the maturity of housing loans and gross disposable income increase. The economy thus depicted is one in which credit affects house prices both directly and indirectly over the short term, via housing stock. Relaxing lending criteria tends to push house prices upwards, while a downward adjustment in interest rates on housing loans has a stabilising effect. Estimating these equations using the same methods produces results that are consistent with those of our reference model (Table 3), even though certain relationships have been deliberately simplified (for example, supply inertia).

2|2 The effects of macroprudential policy shocks

The French Financial Stability Board and ACPR have several macroprudential policy tools at their disposal (see Box 2). Some of these increase the interest

Box 2

Macroprudential tools for the housing market

The purpose of macroprudential policy is to maintain financial stability by preventing excessive growth in credit. Under the French Banking Law of July 2013, the Haut Conseil de stabilité financière *can tighten lending criteria to prevent excessive growth in asset prices or in debt,[1] while the Regulation adopted on 28 June 2013 by the European Parliament[2] authorises the ACPR to increase the risk weighting of housing loans if there is a threat to financial stability. French authorities thus have two types of macroprudential tool which they can use to control the housing market.*

1 *The Financial Stability Board is France's macroprudential authority and comprises the Finance Minister, the Governor of the Banque de France, the Chairman of the ACPR, the Vice-Chairman of the ACPR, the Chairman of the French Financial Markets Authority* (Autorité des marchés financiers), *the Chairman of the French Accounting Standards Board* (Autorité des normes comptables) *and three other qualified persons. Its mandate is defined in Article L631-2 of the French Monetary and Financial Code.*
2 *Article 124.2, CRR.*

.../...

10 *In this model, the stock of housing does not react to GDI. This result is consistent with a short-term horizon where GDI affects credit supply via the constraint on the debt service ratio. The channel via which housing stock adjusts to an increase in demand for housing is not relevant for this time horizon. As a result, only home lending is significant in the housing supply equation.*

Tools targeted at the borrower *reduce the risk associated with financial assets. This category includes caps on the LTI, LTV and DSTI, or on the initial maturity of loans. They limit the risk exposure of the lender and help to ensure that, in the absence of a major shock known to the borrower, the loan will be repaid.*

Tools aimed at the lender *oblige banks to increase their ability to withstand a shock. Thus, by increasing the risk weighting of residential property market exposures, the supervisor forces banks to increase their capital cushion,[3] and thus their ability to absorb shocks. As capital is expensive, this tool could even cause banks to scale back their lending (see Brun, Fraisse and Thesmar, 2013 on the impact of a rise in the cost of capital on corporate lending).*

We simulate three types of shock: a shock to interest rates on housing loans, a shock to the initial maturity of housing loans and a shock to the DSTI ratio. These shocks correspond to the implementation of macroprudential policies specifically targeted at housing loans. Thus, the rise in loan interest rates is not accompanied by a rise in the OAT rate, in order to provide as close as possible a simulation of a tightening of capital requirements;[4] the shock to the DSTI ratio has no impact on household income.

All three shocks are calibrated to have a similar impact on demand for credit: a one-point rise in interest rates on housing loans, the restriction of the DSTI ratio to 30% and a two-year reduction in the initial maturity of loans. These last two shocks are implemented via the lending criteria indicator.

The shocks are applied to the average values of these variables. As a result the evolution of the variables does not accurately capture specific constraints on the margin of loans that are very long term, or those with a DSTI ratio much higher than 33%. The effect of the shocks could be underestimated if they had a significant impact on household expectations of house prices which would substantially increase the user cost of homeownership.

3 Similar results could be obtained by adjusting the LGD (loss given default) and PD (probability of default) parameters using the discretionary measures allowed under Pillar 2, for example.
4 Martins and Schechtman (2013) demonstrate that a capital surcharge targeted specifically at long-term loans would lead to a widening of spreads on these loans. In the approach used here, the capital shock cannot be directly transmitted via the capital adequacy ratio included in the model as this ratio reflects the fact that a well-capitalised bank lends more. It does not describe the differences between banks with or without capital constraints.

rates on housing loans, for example by increasing the risk-weighting of this type of loan in the calculation of a bank's capital adequacy ratio. Other tools lead to a reduction in the amount of debt repayments as a share of disposable income or in the initial maturity of housing loans (measures affecting the LTI, LTV or DSTI ratios, or directly affecting loan maturities).

We simulate all three types of shock (see Box 2 and Charts 2): a shock to interest rates on housing loans, a shock to the initial maturity of housing loans and a shock to the share of repayments in disposable income – the debt service to income ratio or DSTI.

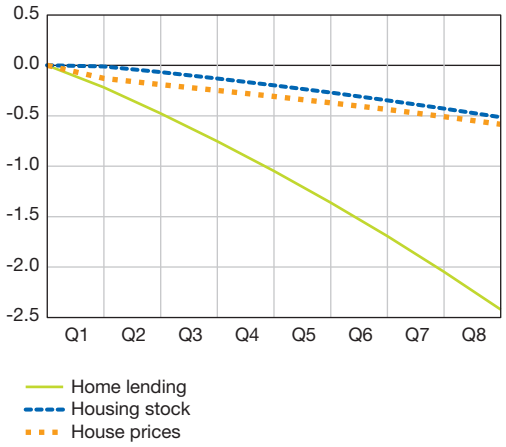
A rise of one percentage point in the interest rate on housing loans would slow the rate of growth in lending. The immediate effect is a 0.13% fall in house prices, then the persistent reduction in lending begins to weigh on house prices and on housing stock, which in turn has a stabilising effect on prices – the pace of decline slows, but the elasticity of housing stock is insufficient to stimulate a rise in prices.

A two-year reduction in the average initial maturity of housing loans will limit the maximum amount that a household can borrow at a given interest rate and with a given level of income. As the impact of a variation in loan maturities on the maximum borrowing amount depends on the level of interest rates, we apply the shock to current rates

Charts 2
Macroprudential policy shocks

(% deviation from baseline scenario; number of quarters)

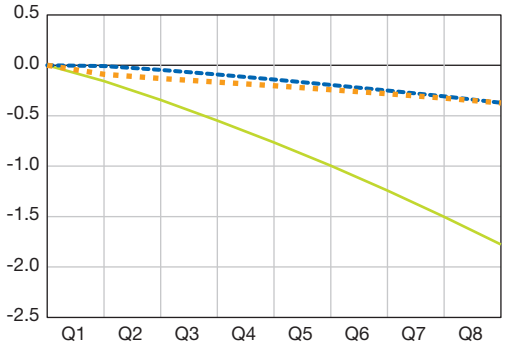
a) One-point increase in housing loan interest rates



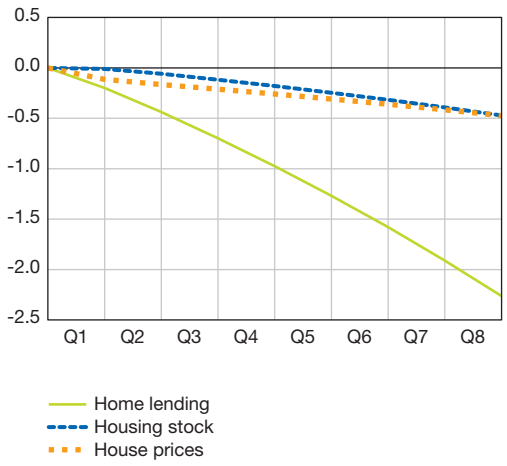
Charts 2
Macroprudential policy shocks (cont'd)

(% deviation from baseline scenario; number of quarters)

b) Two-year reduction in loan maturities



c) Lowering of DSTI ratio to 30%



Source: Authors' calculations.

of interest. The impact on lending is progressive – the immediate result is a 0.16% reduction and then the effect is gradually amplified due to the persistent decline in loan maturities and in house prices. The fall in lending leads to a fall in housing stock and in house prices, as the lack of elasticity in housing supply prevents prices from returning to equilibrium.

Reducing the maximum share of disposable income that can be used for loan repayments (the DSTI ratio) from the current French standard of one third to 30%, would have a similar impact to the previous shock. The shock is transmitted via the lending criteria indicator and results in a 0.2% decline in lending, which is then reinforced by the continuing effect of the DSTI ratio and the decline in prices.

Ultimately, the impact of these measures on house prices is limited by the adjustment in housing stock caused by the decline in lending. However, their effect on home lending is persistent.

3| Conclusion: macroprudential policy and access to homeownership

The particular structure of the French housing market means there is no immediate call for specific macroprudential policies. However, they could be used if destabilising trends were to emerge in the broader economic environment. The home lending market in France appears to be structurally sound. The French preference for institutional guarantees and the corresponding focus on the credit quality of the borrower (notably via the 33% cap on the DSTI ratio) suggest the French financial system is particularly resilient to residential property risk (IMF, 2012). The risk of individual borrower default also remains limited, as shown by the low rate of defaults over the past five years – although it rose sharply after 2007, it has remained below 2%. The potential side-effects of a long-term restrictive macroprudential policy on the housing market also justify taking a cautious approach. The introduction of new constraints would exclude new segments of the population from the housing market, which goes against the goal of increasing homeownership.

That said, recent regulatory changes could undermine the current preponderance of institutional guarantees and the associated focus on borrower solvency. In this case, placing caps on LTV and DTI ratios could prove a useful tool for containing the risk of individual borrower default. A previous study of the home lending market shows that these measures could be complemented with a limit on the duration of residential property loans.

Thus, if destabilising trends were to emerge in the French housing credit market, the introduction of macroprudential constraints would have a non-negligible impact on lending growth and, to a lesser extent, on house prices.

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