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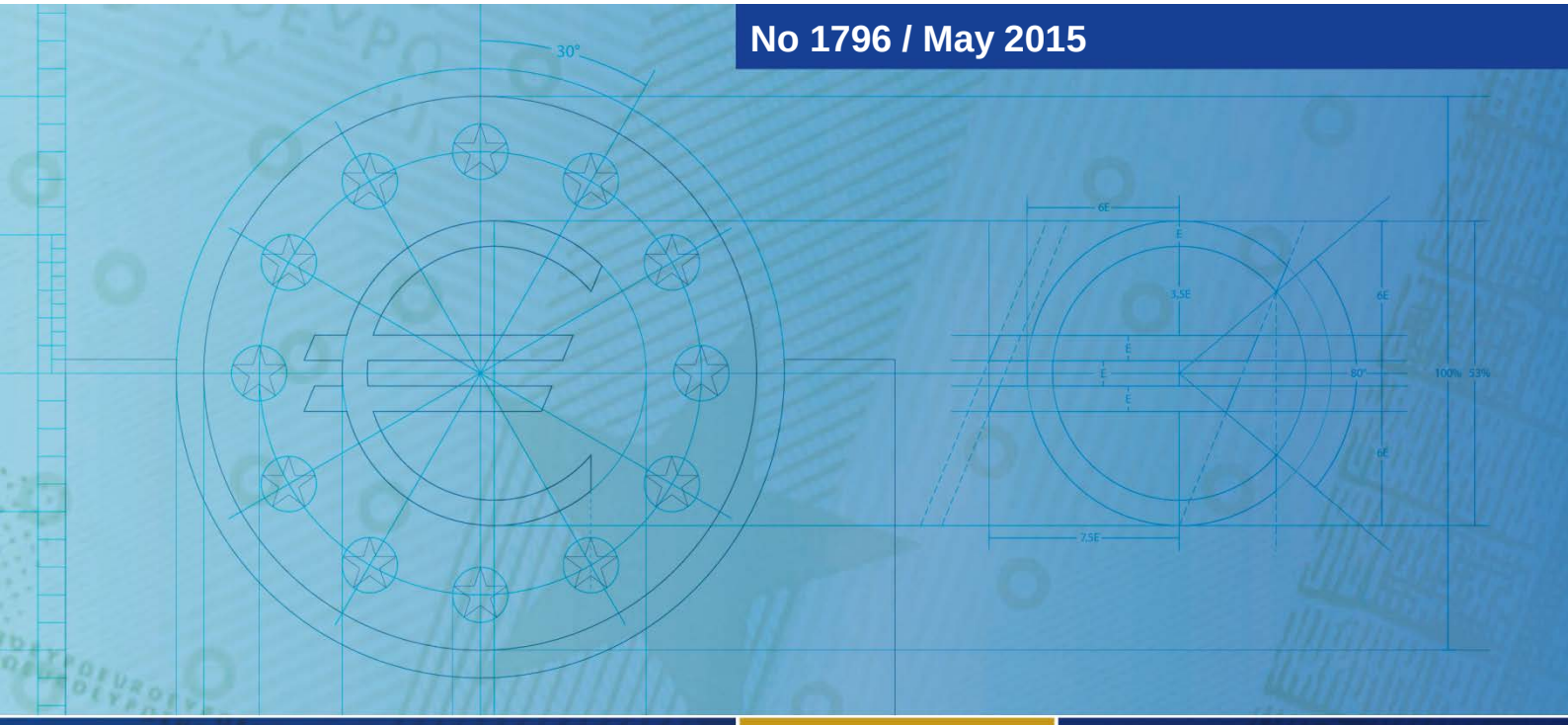
Philipp Hartmann

Real estate markets and macroprudential policy in Europe



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Abstract

Boom-bust cycles in real estate markets have been major factors in systemic financial crises and therefore need to be at the forefront of macroprudential policy. The geographically differentiated nature of real estate market fluctuations implies that these policies need to be granular across regions and countries. Before the financial crisis that started in 2007 property markets were overvalued in a range of European countries, but much like in other constituencies active policies addressing this were an exception. An increasing number of studies suggest that borrower-based regulatory policies, such as reductions in loan-to-value or debt-to-income limits, can be effective in leaning against real estate booms. But many of the new macroprudential policy authorities in Europe do not have clear powers to determine them. Moreover, the cross-border spillovers they may give rise to suggest the establishment of a well-defined macroprudential coordination mechanism for the single European market.

JEL codes: G01, G28, R39, G17, E5

Key words: real estate markets, macroprudential policy, systemic risk, financial crises, bubbles, financial regulation, financial stability indicators

Non-technical summary

This short paper first summarises why, historically, real estate markets have played an important role in systemic financial cries. Then it documents the development of real estate prices in Europe before and during the recent financial crisis. Third, it assesses whether real estate valuations in Europe showed misalignments before the crisis broke out and recently. Last, it discusses which regulatory policy instruments are most promising for containing widespread real estate market imbalances and how the European regulatory setup may have to be completed to ensure their effective use in the single market for financial services. The core data used are quarterly real residential property price indexes for 15 EU countries, Switzerland and the US states of California and Texas between 2002 and 2014.

The results suggest that the role that real estate markets played in the recent financial crisis confirms their significant importance for systemic risk, as indicated by historical literature. Four main reasons for the systemicness of real estate markets are their (and the construction sector's) large importance in the economy, the leveraged financing of construction projects and house purchases, slow adjustments in real estate supply and prices and the indivisibility of property. As a consequence, these markets need to receive primary attention from macroprudential policy makers.

Real estate valuations of European countries showed three different patterns since 2002. Some had a boom-bust cycle (e.g. Greece, Ireland and Spain), others more or less continuous growth (e.g. Belgium, Finland, Sweden or Switzerland) and again others only limited fluctuations (e.g. Germany or Portugal). The strong country/regional components, which are also visible across US states (e.g. California experienced a boom-bust cycle, whereas Texas had a rather flat property market), suggest that macroprudential policies leaning against the more dangerous cycles need to be granular across regions or countries.

For a range of European countries a series of economic models and indicators consistently indicate (within sample, so with the benefit of hindsight) material overvaluations of real estate markets before the break out of the financial crisis. These countries include at least Belgium, Denmark, France, Ireland, the Netherlands, Spain, Sweden and the United Kingdom. Many of them also experienced strong price growth rates (after controlling for the effects of fundamentals). More recently (e.g. early in 2014), some overvaluation is only identified for Sweden and strong price growth only for Germany. Against the background of concerns voiced by some that very expansionary monetary policies could contribute to the build-up of financial imbalances these findings suggest that generalised imbalances do not seem to be visible in European residential real estate markets. At the same time the results also illustrate the challenge for macroprudential policy that different models or indicators can easily give contradictory results about the presence of imbalances in a given real estate market.

Targeted regulatory instruments against burgeoning real estate markets can be lender or borrower based. Lender based instruments include the weights of real estate exposures or the assumed losses given default in capital ratios. Borrower based instruments include loan-to-value or debt-to-income limits. A new empirical literature on the effectiveness macroprudential regulatory policies seems to increasingly suggest that borrower based instruments may be more effective in containing real estate bubbles than lender based instruments. Moreover, research produced in the context of the

European System of Central Banks Macroprudential Research Network (MaRs) suggests, first, that policies adjusting loan-to-value ratios in a countercyclical way and combining them with debt-to-income limits can be expected to be more effective than traditional approaches. Second, cross-border regulatory spillovers may be significant.

Much like in other constituencies, before the crisis active regulatory policies leaning against burgeoning real estate markets were the exception in Europe rather than the rule. A lesson from this experience is that going forward policy makers need be bold enough to lean against booming real estate markets that imply systemic risks. In terms of completing the regulatory setup in European Union (EU) countries for this purpose, it is important to note that only a subset of countries have the necessary legislation in place to actively use loan-to-value or debt-to-income limits. And among those who have, not all allocate their use to macroprudential authorities. Finally, the Single Supervisory Mechanism for banks, which started at the European Central Bank in November 2014, has a coordinating role for some lender based regulatory instruments (as included in the Capital Requirements Directive IV and the Capital Requirements Regulation implementing Basel III) in that it can tighten relevant bank regulations in countries that joined but not relax them. A more complete macroprudential policy framework for supporting the EU single market for financial services would probably require a legal basis for the use of borrower based instruments by macroprudential policy authorities in all member countries, including a well-defined cross-border coordination mechanism for both lender and borrower based instruments.

1. The role of real estate markets in systemic financial crises

Economic history suggests that some of the most severe systemic financial crises have been associated with boom-bust cycles in real estate markets (e.g., Bordo and Jeanne 2002, Reinhart and Rogoff 2008, Crowe et al. 2013).[1] Prominent examples include the Nordic and Japanese banking crises as well as the Asian financial crisis of the 1990s. The financial crisis that started in 2007 was not exceptional in this regard, but rather confirmed a historical regularity.[2]

Interestingly, the deep underlying sources of this "stylised fact" are not well researched. A first step for understanding this fact is a clear definition of systemic risk. When I developed my preferred definition of this risk I tried to be quite general, build on the full body of available literature and at the same time allow for its operational use in policy. The resulting definition refers to the risk that financial instability becomes so widespread that it impairs the functioning of the financial system to a point where growth and welfare suffer materially (see ECB 2009b).

Why can real estate bubbles be associated with this risk? First, many firms and households own real estate and construction is an important sector of the real economy. So when there is a widespread downturn of real estate prices the effects can be system-wide and have large real and welfare implications. Second, construction projects or house purchases are often credit-financed and the credit is often provided by leveraged lenders. As a consequence, a material downturn in real estate prices can make these borrowers default and the effects of these defaults are further amplified through a deleveraging process of the lenders that incur the losses from defaults. Third, real estate supply tends to adjust sluggishly and price discovery is slow (e.g., due to high transaction costs, infrequent trades and the infeasibility of short sales). This means that fluctuations in property prices can be long and large, which may also contribute to occasional illusions about the continuation of an existing trend.[3] Fourth, the indivisibility of real estate weighs further on prices during a downturn.[4]

The tools for reducing and containing systemic risks are now widely denoted as macroprudential policies. I hope that the above considerations make clear that real estate markets need to be an area

[1] For example, Reinhart and Rogoff (2009) write that "housing price cycles in the advanced economies … have long been known to play a central role in financial crises" (page 142). Kaminsky and Reinhart (1999), who also cover many emerging market and developing countries, note that "in many of the crises in our sample a substantial portion of banks and finance companies were considerably overexposed to real estate" (page 486). Crowe et al. (2013) find that "…Of the 46 systemic banking crises for which house price data are available more than two-thirds were preceded by boom-bust patterns in house prices. Similarly, 35 out of 51 boom-bust episodes were followed by a crisis." (page 302).

[2] For a broad discussion of the role of housing markets in the 2007-2009 financial crisis, see Duca et al. (2010).

[3] Gelain et al. (2013) suggest that if a part of the agents in an economy have adaptive expectations – i.e. they extrapolate past housing price developments into the future –, then fluctuations of the housing market and ultimately of economic activity are amplified.

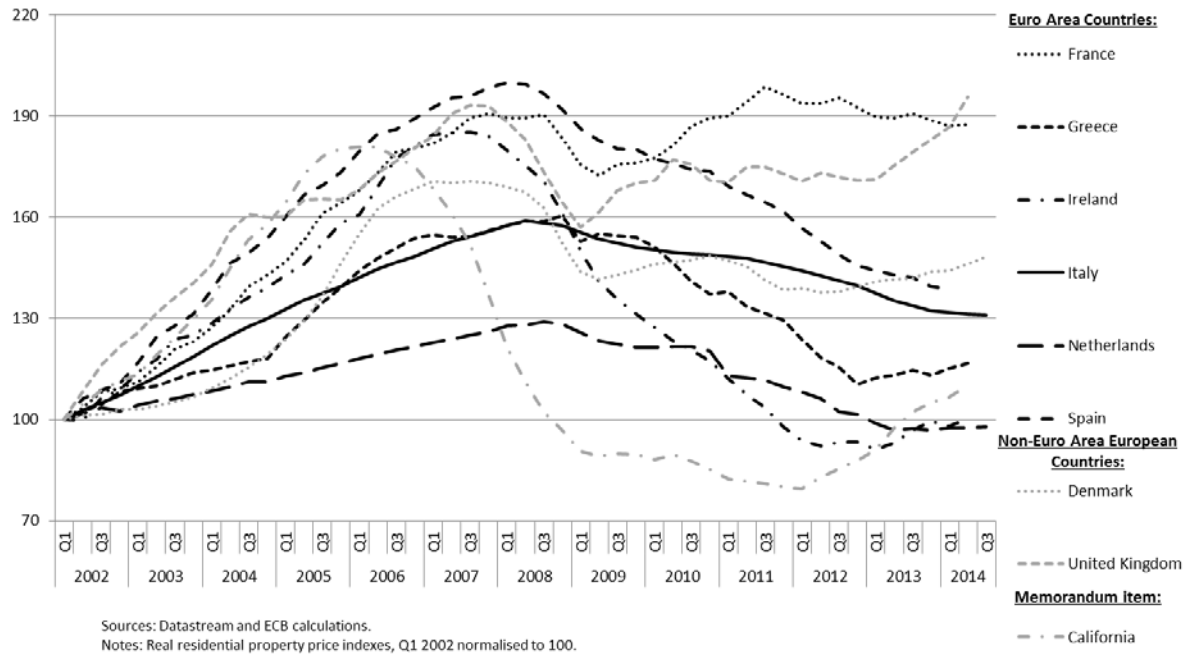
[4] For a related discussion, see Crowe et al. (2013).

of primary attention for macroprudential policy. One challenge with this is that during an economic upturn, when leaning against rising property prices and credit may be particularly important, the implementation of macroprudential policies can go against other social and tax policies aimed at fostering credit availability and home ownership.

2. Real estate price developments in Europe before and during the crisis

Against this background, let us look at European property price developments in figures 1 and 2. Figure 1 shows a group of euro area and non-euro area European countries that experienced residential property price booms before the financial crisis, followed by some form of bust (e.g., Greece, Ireland and Spain). Figure 2 shows two other groups of European countries over the same period of time. One group had rather flat property prices (e.g., Germany and Portugal) and another experienced continuing upward trends (e.g., Belgium, Finland, Sweden or Switzerland), in some cases after a short-lived downward correction associated with the crisis.

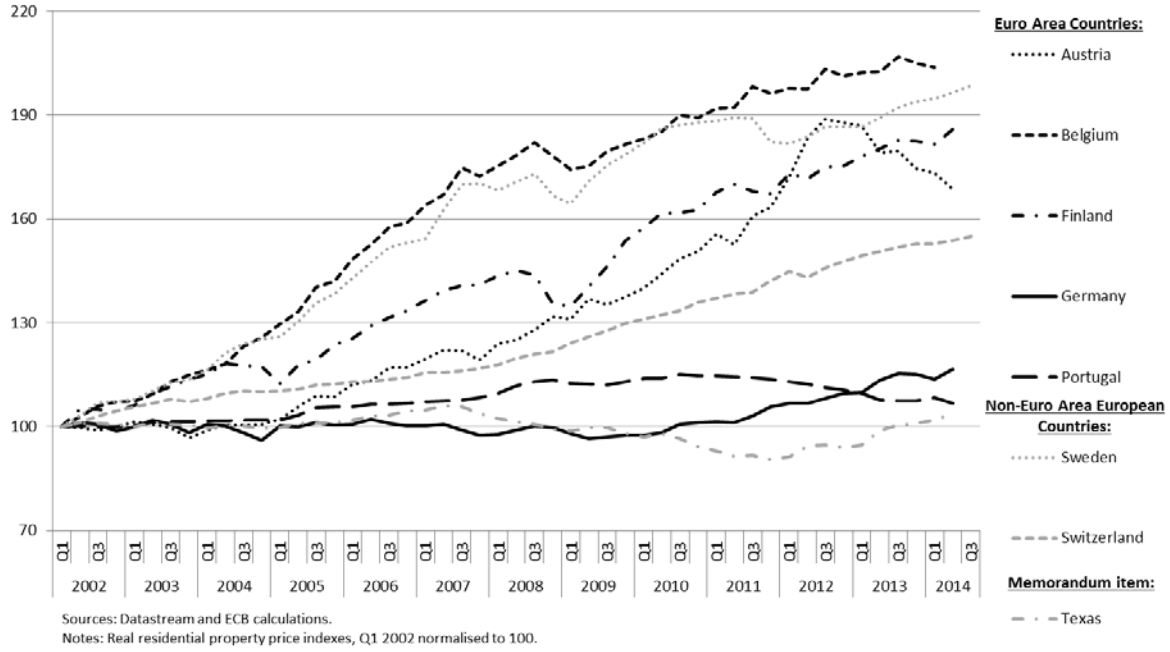
Figure 1: European countries with a boom-bust cycle in real estate markets (2002-2014)



Sources: Datastream and ECB calculations.
Notes: Real residential property price indexes, Q1 2002 normalised to 100.

Behind the differential performance of European real estate markets are many institutional and macroeconomic factors, some rather specific to individual countries.[5] And in some cases the macroeconomic implications of the boom-bust property cycle were rather devastating (e.g., in Ireland or Spain) and in others more moderate (e.g., in Denmark). But one clear takeaway is that real estate market fluctuations can have strong regional components. In other words, macroprudential policies aimed at dampening the more dangerous cycles need to take these differences into account and be granular across regions or countries.

Figure 2: European countries with increasing or flat real estate markets (2002-2014)



Sources: Datastream and ECB calculations.
Notes: Real residential property price indexes, Q1 2002 normalised to 100.

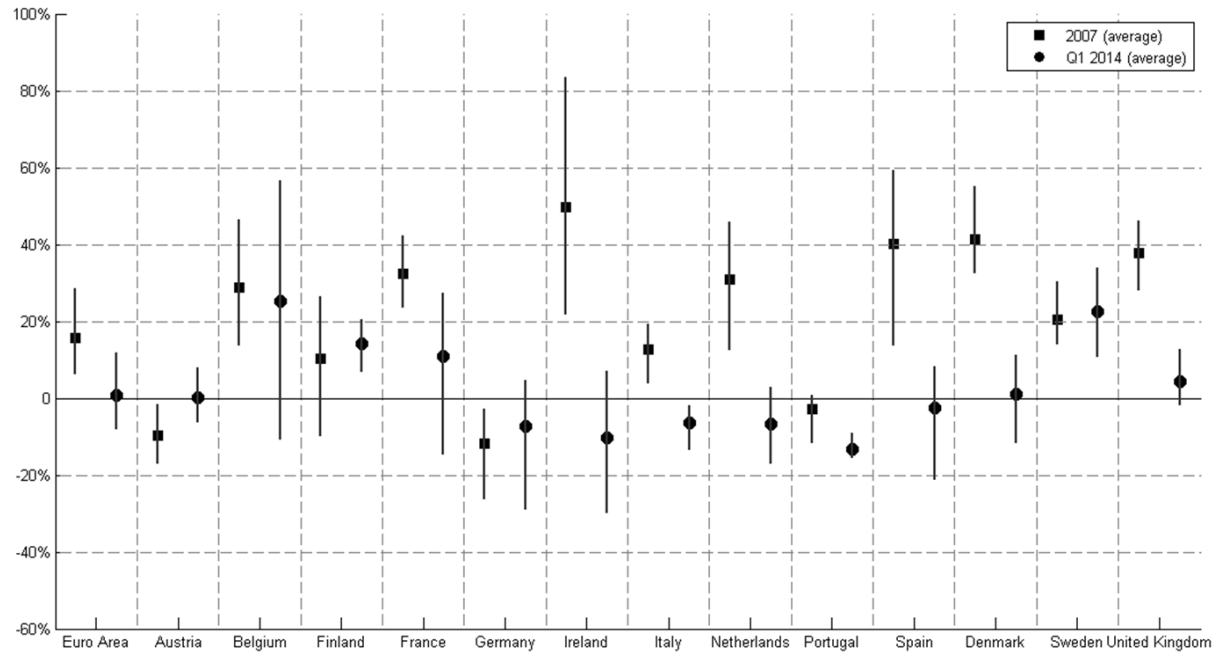
The memorandum items of the two figures illustrate that this insight is by no means limited to Europe, even though institutional and macroeconomic differences within a mature nation state will be much more limited than in the case of a monetary or economic union of different states. The state of California in the United States, for example, had a property boom-bust cycle, much like Ireland or Spain in Europe (figure 1). The state of Texas experienced a flat property market over the same period, much like Germany or Portugal (figure 2).

[5] For in-depth discussions of the determinants of housing valuations and institutional differences in mortgage markets in European (and other) countries, see Blake and Muellbauer (2009) and ECB (2009a). Institutional differences relate, inter alia, to the relative proportion of fixed versus variable rate mortgages, the existence or not of a sizeable covered bond market, the types of intermediaries involved in mortgage lending, bankruptcy laws or tax regimes.

3. Macroprudential surveillance of real estate markets

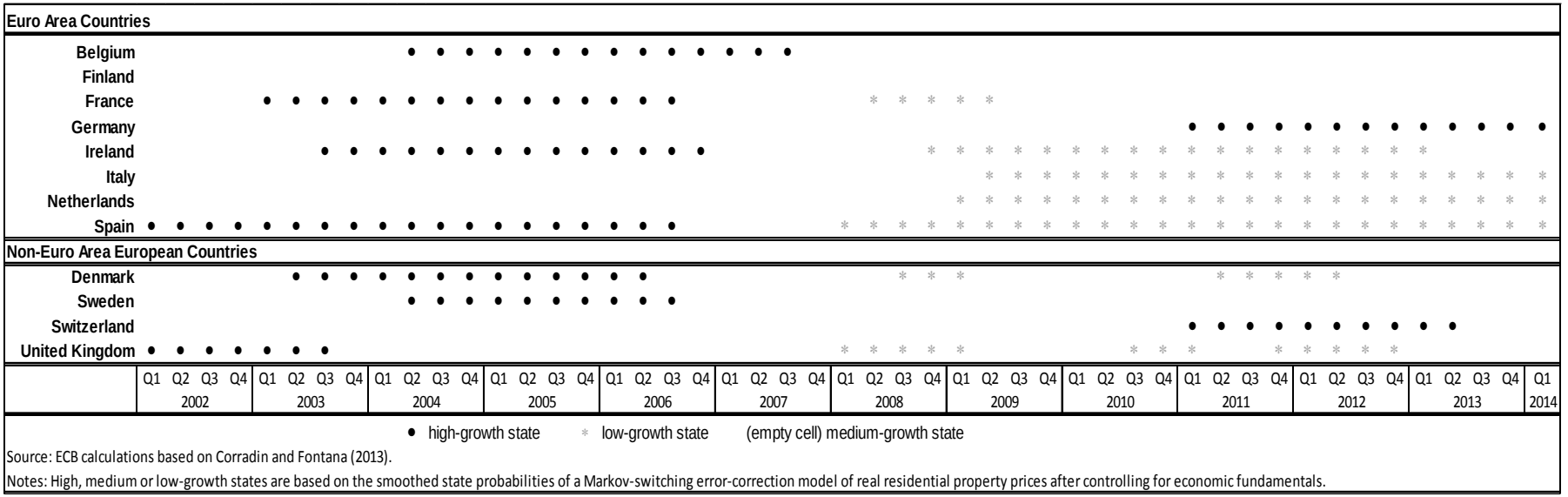
A first step for containing the systemic risk embedded in large real estate market swings is to identify when a property market starts to become overvalued or exhibits strong growth. Figures 3 and 4 show the European results from a set of standard indicators and novel models that can be used for this purpose. Figure 3 exhibits the range of identified over- or undervaluations for each country and the euro area at two points in time; at the peak of the housing bubble (taken to be 2007) and for recent data (first quarter 2014). The range is determined by the results from the price-to-rent ratio, the price-to-income ratio and two models regressing housing prices on fundamentals. Figure 4 shows the results of a Markov-switching model of housing prices with three states, highly growing ("hot"), medium growing ("normal") and slowly growing or declining ("cold") housing markets (Corradin and Fontana 2013).

Figure 3: Estimates of the over/undervaluation of residential property prices in selected European Union countries (2007 and 2014)



Source: ESRB risk dashboard, September 2014.
Notes: Estimates based on four different valuation methods: price-to-rent ratio, price-to-income ratio and two model-based methods (explained in box 3 of ECB 2011). For each country the two solid lines represent the ranges of estimates, calculated as the interval between the minimum and maximum estimate for each of the two dates reported in the legend.

Figure 4: Estimates of growth rates of residential property prices relative to economic fundamentals in selected European Union countries (2002-2014)



Source: ECB calculations based on Corradin and Fontana (2013).

Notes: High, medium or low-growth states are based on the smoothed state probabilities of a Markov-switching error-correction model of real residential property prices after controlling for economic fundamentals.

All in all, there is quite clear evidence that residential real estate prices were significantly overvalued or fast-growing in a range of European countries before the crisis. The same consistent picture does not emerge for recent data, where signs of froth in real estate markets are visible only for a small number of countries. The latter observation is also interesting against the background of the discussion about potential unintended side effects of highly accommodative monetary policies. For example, it would be hard to claim at the present juncture that the ECB's unconventional monetary policies have led to a broad-based real estate boom in the euro area. The results of figures 3 and 4 also illustrate the challenge for macroprudential policy that different indicators or models of real estate markets may easily give a contradictory picture about whether a bubble is building up or not.

4. Macroprudential regulatory instruments against real estate bubbles

A second step is to identify, once overvaluation or fast growth becomes a material risk, which regulatory policy instruments could be used to stop the boom or even bring real estate market valuations or credit back to levels that are in line with economic fundamentals. A recent overview of European countries' experiences with macroprudential regulatory policy suggests that active policies addressing burgeoning property markets were, if anything, an exception prior to the crisis (Kok et al. 2014).[6]

Which are the instruments that could be used in such a situation?[7] Regulatory policy instruments leaning against fast-growing real estate markets or creating buffers against the associated risks can target either lenders or borrowers. For banks, real estate sector-specific capital requirements could be applied. For example, the capital ratio, risk weights or assumed losses given default (LGD) could be increased when a boom is picking up. Such measures can be expected to be more effective in enhancing the resilience of banks against borrower defaults than limiting price inflation or credit growth. For borrowers, the maximum amount of (mortgage) debt could be constrained. This can be done via lower loan-to-value (LTVs), loan/debt-to-income (LTIs/DTIs) or debt-service-to-income limits (DSTIs). These measures can be expected to be more effective in leaning against price inflation or credit growth, while only exercising an indirect effect on the resilience of financial intermediaries. Broader policy instruments against the build-up of aggregate credit imbalances in general, such as the Basel countercyclical capital buffer, leverage ratios, dynamic provisioning (as used by the Bank of

[6] For example, a comparison of average loan-to-value ratios (LTVs) in new residential mortgage loans across EU countries and over time undertaken by the European Systemic Risk Board (ESRB 2014, box 3.4) and the Banca d'Italia (2013, pages 15f.) suggests that LTVs in the countries with the most drastic real estate booms stayed constant in 2006 and 2007 or tightened only very little. See also the country cases discussed in ESRB (2014, boxes 3.1 and 3.2). This policy inaction was also prevalent in many non-European countries.

[7] For detailed discussions of the policy options, see e.g. Vandenbussche et al. (2012), Crowe et al. (2013), Kuttner and Shim (2013) or chapter 3 of ESRB (2014).

Spain long before the crisis) or maximum loan amortisation periods, also exist, but these are outside the scope of this note.[8]

The policy competencies for using these instruments in Europe are determined, inter alia, by whether they are included in European Union (EU) legislation or national legislation. The relevant EU banking legislation, and therefore applying to all member countries, is determined in the Capital Requirements Directive ("CRD IV") and the Capital Requirements Regulation ("CRR"). Of all the instruments that can directly address real estate market problems the CRD IV and CRR cover sectoral capital requirements and associated risk weights and LGDs.[9] Accordingly, the national authorities in charge can use them whenever suitable. Also the Single Supervisory Mechanism (SSM) at the European Central Bank (ECB), which as of November 4, 2014 supervises the 123 most significant banks operating in euro area countries, can employ those instruments. But contrary to national authorities it can only tighten and not relax them.

The regulatory policy instruments that can directly address real estate market problems that are not covered by the CRD IV or CRR include LTVs, LTIs/DTIs and DSTIs. They can be used in countries that included them in their national legislation, but not by the SSM. An unpublished survey by the European Systemic Risk Board conducted in the summer of 2013 found that 16 EU countries can use LTVs, 6 DTIs, 2 LTIs and 3 payment-to-income limits. But not all of the national macroprudential authorities have the power to determine these limits. In countries where their primary purpose is consumer protection (3 cases) or bank solvency requirements (4 cases) other authorities may have the primary power to determine them. Also links between loans and their funding instrument, such as the case for covered bonds, may limit the changeability of LTVs (2 cases).

Policy makers often refer to the limited experiences with these policy instruments, their potential unintended side effects and the ability of agents to evade them as challenges for using them. For example, one frequently hears that the positive experiences gained in (small) countries like Hong Kong, Israel, Singapore or South Korea may not be applicable in a European or large industrial country context. There is, however, an increasing number of country case studies and multi-country econometric analyses about the effectiveness of the main regulatory policy instruments for containing real estate market problems, both for prices and quantities (see e.g. Crowe et al. 2013, ESRB 2014, Kok et al. 2014 and Claessens et al. 2014 for overviews). A casual reading of this literature would suggest that the evidence is "mixed"; there are more and less successful cases. A more careful consideration of the evidence, however, gives indications that they can be effective. For example, an increasing number of econometric studies suggest that borrower-based measures, such as LTVs, DTIs or DSTIs, tend to limit property price or mortgage credit growth in advanced countries, even though the infamous "inaction bias" in past prudential policy – with the benefit of hindsight – probably led to the actions being taken too little and too late. The usefulness of LTVs is

[8] Other policy instruments outside the scope of this note that may help limiting financial imbalances include monetary policy, tax policies, sectoral concentration limits, certain accounting approaches or constraints on certain compensation practices.

[9] CRD IV and CRR cover many more regulatory instruments, including the ones against more general credit imbalances, much beyond real estate markets, such as the countercyclical capital buffer or the leverage ratio.

also supported by theoretical research conducted under the European System of Central Banks Macroprudential Research Network (MaRs; see ECB 2014). As Mendicino (2012) and Gelain et al. (2013) point out in their MaRs papers, however, LTVs should be more effective when being adjusted in a countercyclical way and when being combined with DTIs in a generalised borrowing constraint. On the latter point, Corradin (2014) argues, for example, that a higher income and a lower risk of unemployment persistence increases optimal households' leverage for housing finance. Consequently, the MaRs report advises that LTVs and DTIs should be considered together and not in isolation of each other

So, the issue emerges as to whether the main obstacles to implementing macroprudential regulatory policy instruments are the narrow mandates of the competent authorities (see e.g. the limited number of countries in the EU where the macroprudential authority can clearly determine LTVs or DTIs referred to above and a still existing focus on policy instruments with respect to bank risks rather than a full system-wide perspective) and/or political economy reasons (notably that really "biting" instruments are "socially charged", as indicated at the end of section 1. above).

Finally, MaRs research also suggests that the use of capital requirements and LTVs may lead to cross-border spillovers. This raises the issue of whether regulatory policies that lie outside the EU's common legal framework, such as LTVs or DTIs, should also be made subject to some coordination in Europe (ECB 2014). The SSM does not have the power to do so at present.

5. Concluding remarks

Given the important role that real estate markets have played in past systemic financial crises, they need to receive a lot of attention by macroprudential policy makers. Policies need to be granular enough to deal with the fact that property credit cycles can exhibit strong regional features. There is increasing theoretical support and empirical evidence that borrower-based regulatory policies can be effective, diminishing the credibility of claims that there is not enough experience to practically apply such instruments. In the case of the European Union or euro area there may be room in a significant number of countries for putting these instruments more clearly in the hands of newly created macroprudential policy authorities and for creating coordination mechanisms for national LTV or DTI policies at the area-wide level to address the cross-border spillovers potentially caused by these policies.

All in all, in order to better develop the new macroprudential policy branch, policy makers need to be bold enough to undertake the necessary actions where real estate markets are booming. This will also help to better define the relative roles of monetary and macroprudential policies, potentially clarifying the conditions under which monetary policy could remain focused on price stability in the first place and would lean against emerging financial imbalances only in second place (should macroprudential policy fail; see sub-section 2.6.2 of ECB (2014) for further discussion and literature).

References

Banca d'Italia (2013), Financial stability report, no. 5, April.

Blake, N., and J. Muellbauer (2009), Developing analytical methods for the identification of imbalances and risks in the EU housing markets, Final report for the European Commission, Oxford Economics, September.

Bordo, M., and O. Jeanne (2002), Monetary policy and asset prices: Does 'benign neglect' make sense?, *International Finance*, 5(2), 139-164.

Claessens, S., S. Ghosh and R. Mihet (2014), Macro-prudential policies to mitigate financial system vulnerabilities, IMF Working Paper, No. WP/14/155, August.

Corradin, S., and A. Fontana (2013), House price cycles in Europe, ECB Working Paper, no. 1613, November.

Corradin, S. (2014), Household leverage, *Journal of Money, Credit and Banking*, 46(4), 567-613.

Crowe, C., G. Dell'Ariccia, D. Igan and P. Rabal (2013), How to deal with real estate booms: Lessons from country experiences, *Journal of Financial Stability*, 9(3), 300-319.

Duca, J., J. Muellbauer and A. Murphy (2010), Housing markets and the financial crisis of 2007-2009: Lessons for the future, *Journal of Financial Stability*, 6(4), 203-217.

European Central Bank (2009a), Housing finance in the euro area, Structural Issues Report, March.

European Central Bank (2009b), The concept of systemic risk, Financial Stability Review, December.

European Central Bank (2011), Financial stability review, June.

European Central Bank (2014), Report on the Macroprudential Research Network (MaRs), June.

European Systemic Risk Board (2014), The ESRB handbook on operationalising macro-prudential policy in the banking sector, March.

Gelain, P., K. Lansing and C. Mendicino (2013), House prices, credit growth, and excess volatility: Implications for monetary and macroprudential policy, *International Journal of Central Banking*, 9(2), 219-276.

Kaminsky, G., and C. Reinhart (1999), The twin crises: The causes of banking and balance-of-payments problems, *American Economic Review*, 89(3), 473-500.

Kok, C., R. Martin, D. Moccero and M. Sandstöm (2014), Recent experience of European countries with macro-prudential policies, ECB Financial Stability Review, May, 113-126.

Kuttner, K., and I. Shim (2013), Can non-interest rate policies stabilise housing markets? Evidence from a panel of 57 economies, BIS Working Paper, No. 433, November.

Mendicino, C. (2012), Collateral requirements: Macroeconomic fluctuations and macro-prudential Policy, Banco de Portugal Working Paper, No. 11, April.

Reinhart, C., and K. Rogoff (2008), Is the 2007 U.S. subprime crisis so different? An international comparison, *American Economic Review Papers and Proceedings*, 98(2), 339-344.

Reinhart, C., and K. Rogoff (2009), *This Time Is Different: Eight Centuries of Financial Folly* (Princeton, NJ: Princeton University Press).

Vandenbussche, J., U. Vogel and E. Detragiache (2012), Macroprudential policies and housing prices – A new database and empirical evidence for Central, Eastern, and Southeastern Europe, IMF Working Paper, No. WP/12/303, December.

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Philipp Hartmann
European Central Bank, Frankfurt am Main, Germany;
e-mail: philipp.hartmann@ecb.int

Postal address	60640 Frankfurt am Main, Germany
Telephone	+49 69 1344 0
Internet	www.ecb.europa.eu

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