

II. Links between housing and real economy in the euro area

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Abstract: Housing represents a large share of household wealth and housing market developments are of high importance for the overall economy. Since 2014, house prices have increased across the euro area and accelerated further since the COVID-19 pandemic. This article analyses the links between GDP, residential construction, lending rates, mortgage credit and house prices in the euro area, and tests the impact of macroprudential and monetary policy on housing markets. The empirical results confirm that there are strong links between the housing market and the real economy at euro area level. The differences in these links across Member States can, at least in part, be related to different degrees of elasticity of the housing supply. The results also found that both macroprudential and monetary tools have a significant impact on house prices and on mortgage credit in the euro area.

II.1. Introduction

Housing is a special type of good, characterised as a durable asset or a stream of services for the owner. Housing also represents a large share of household wealth and a main reason for households to take on long-term debt. Changes in house prices thus affect household spending and investment decisions. In the longer term, they also affect the redistribution of resources across and within generations.⁽³⁸⁾ Residential mortgages constitute a substantial component of the asset portfolios of financial institutions, so changes in house prices also affect the financial sector's performance.⁽³⁹⁾ All in all, housing market developments can have large effects on economic activity, on financial stability and on overall welfare, which was highlighted during the Global Financial Crisis (GFC) of 2008.⁽⁴⁰⁾

House price developments are the outcome of demand and supply conditions that are determined by the level of economic activity, financial conditions, institutional structure of housing markets and housing-related policies.⁽⁴¹⁾ These factors are intertwined and have both euro area and country-level dimensions, which can give rise to differences across countries. Though the euro area

shares a common monetary policy, there are differences between national residential markets and mortgage markets. Coupled with macroprudential measures taken at country level, this results in differences in credit availability and funding conditions. There are also differences in zoning and building regulation across and within the Member States, which create differences in housing supply elasticity,⁽⁴²⁾ i.e. changes in new residential constructions to changes in housing demand. Finally, different modalities of housing-related taxation⁽⁴³⁾, including subsidies for home ownership, rental regulations and the provision of social housing are all policy factors that affect demand for housing, alongside fundamental drivers such as income and population growth.

Recently, given the links between housing and the real economy, there has been a greater emphasis on monitoring and assessing house market trends in macroeconomic surveillance and policy. For example, the Commission uses different approaches to estimate benchmarks for house prices.⁽⁴⁴⁾ In addition to comparing the current price levels with the estimated benchmarks (i.e. assessment of the valuation gaps), it is also important to understand the short-term dynamics of house prices and the role of different shocks, including monetary and macroprudential shocks.

⁽³⁸⁾ Campbell, J. and J. Cocco (2007). How do home prices affect consumption? Evidence from micro data. *Journal of Monetary Economics*, 54(3), 591-621.

⁽³⁹⁾ Martins, M., A. Serra, F. Martins and S. Stevenson (2019). Residential property loans and bank performance during property price booms: Evidence from Europe. *Annals of Economics and Finance*, 20(1), 247-295.

⁽⁴⁰⁾ Martins, V., A. Turrini, B. Vašíček and M. Zamfir (2021). Euro Area Housing Markets: Trends, Challenges and Policy Responses, European Economy – Discussion Papers No 147.

⁽⁴¹⁾ For very comprehensive review of drivers of house prices see: Duca, J. V., J. Muellbauer and A. Murphy (2021). What drives house price cycles? International experience and policy issues, *Journal of Economic Literature*, 59(3), 773-864.

⁽⁴²⁾ Andrews, D., A. C. Sánchez and A. Johansson (2011). *Housing markets and structural policies in OECD countries*. Paris: OECD Publishing.

⁽⁴³⁾ Fatica, S. and D. Prammer (2018). Housing and the tax system: how large are the distortions in the euro area? *Fiscal Studies*, 39(2), 299-342.

⁽⁴⁴⁾ Philipponnet, N. and A. Turrini (2017). Assessing House Price Developments in the EU. European Economy – Discussion Papers No 048. Philipponnet, N. (2018). The start of a new cycle: Recent housing price dynamics in Europe and their macroeconomic implications, *Quarterly Report on the Euro Area*, 3, 57-68.

For example, the ECB's ongoing monetary tightening cycle can subdue housing demand in the euro area due to the rising cost of borrowing. However, it can also have collateral and wealth effects and in turn curb household spending and the overall output. As the house price dynamic is an important driver of residential construction (45), the resulting adjustment of house prices may dampen residential investment, which may also have a significant bearing on GDP.

This Section is organised as follows. In the next subsection we describe the main developments in the housing markets in the euro area and across euro area countries. Then we describe the empirical model tracking links between housing and the real economy and show the results. We then extend the model to bring in policy variables (macroprudential tools and the shadow rate). The fourth subsection concludes and suggests paths for further analysis.

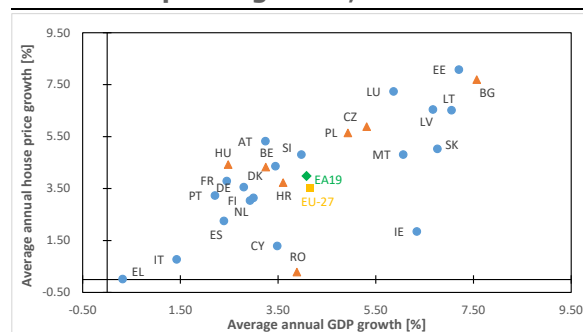
II.2. Main developments in the euro area

In the long term, the increase in house prices in the EU is related to GDP growth (Graph II.1). High GDP growth is generally accompanied with high house price growth. (46) The Member States that are catching up feature the highest increase in house prices. In the euro area, nominal house prices grew at around 4% annually over the period 2004–2022, which is almost the same as nominal GDP growth over that period. (47)

Looking at the euro area as a whole, house prices have followed several phases over the last two decades (Graph II.2): (a) increasing (significantly in some countries) during much of the first decade interrupted by the onset of the GFC, (b) stagnating (or for some countries experiencing a significant correction) after the crisis, before (c) increasing

again steadily (from 2014 onwards) and accelerating since the pandemic. (48)

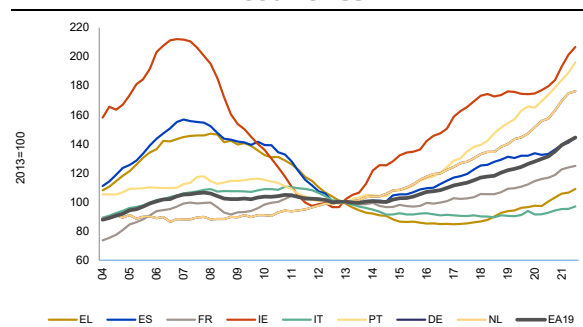
Graph II.1: Nominal GDP growth vs house prices growth, EU-27



(1) The circles stand for euro area countries, the triangles for non-euro area countries, EA-19 (diamond) and EU-27 (square) are simple averages of those Member States; nominal GDP in euro (seasonally and calendar adjusted data); all averages cover the sample period (2004q1–2022q1) except for CZ (2005q1–2022q1), EE (2004q3–2022q1), HU (2008q1–2022q1), MT (2006q1–2022q1), PL (2006q1–2022q1), RO (2010q1–2022q1) and SK (2006q1–2022q1) due to the availability of house prices.

Source: Eurostat, own calculations.

Graph II.2: House prices, selected euro area countries



(1) EA-19 is a simple average of those Member States.

Source: Eurostat, own calculation.

House price developments can be assessed against construction activity in the euro area. Building permits, which can be seen as a noisy proxy for new residential developments (indicating the intention to build, Graph II.3) have fallen since the GFC. (49) This was very pronounced in countries

(45) Dohring, B. (2018). Cyclical patterns of residential construction, *Quarterly Report on the Euro Area*, 3, 59–67.

(46) For completeness, when considering only the real annual GDP growth, its rate reached 1.9% over the sample period (2004q1–2022q1). For comparability reasons, all averages mentioned in this paragraph are calculated as unweighted averages of quarterly growth rates of twelve euro-area Member States ('old euro area members') listed below in the text.

(47) Irish GDP growth has been increasingly influenced by the inclusion of foreign-owned multinational enterprises; see Box in ECFIN, 'European Economic Forecast', Summer 2022, Institutional Paper 183, July 2022. The average house price growth in Romania may be influenced by the data availability in the analysed period (a burst of a bubble in late 2000s).

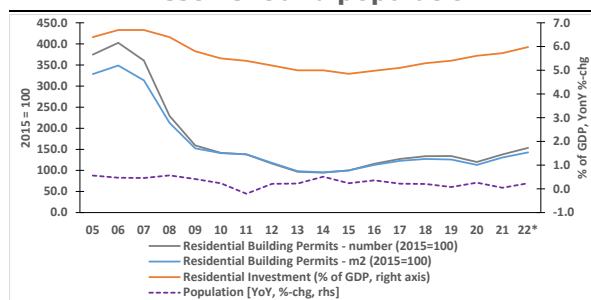
(48) For an early analysis of house-price developments in the euro area, see 'Focus: Assessing the dynamics of house prices in the euro area', *Quarterly Report on the Euro Area*, 4, December 2012, 7–18.

(49) The data on building permits shown in the graph should be interpreted carefully as the euro-area aggregate before the Global Financial Crisis was driven by few countries with a large number of building permits (reflecting the speculative nature of some projects during the real estate bubble).

such as Spain but the trend has been broad-based across euro area countries, and the recovery that started in 2014 was only very mild. The ratio of residential investment to GDP fell after the GFC too before it started to recover around 2015.

However, part of this recovery was driven by renovation to increase the energy efficiency of buildings.⁽⁵⁰⁾ That is important in terms of environmental goals, but it does not add significantly to the existing housing stock. Housing supply constraints in the euro area are to a large extent driven by stringent zoning and building regulations,⁽⁵¹⁾ meaning they are likely to persist despite the ongoing post-pandemic recovery.⁽⁵²⁾

Graph II.3: Building permits, housing investment and population



(1) *22 = based on the first quarter of 2022.

Source: Eurostat, own calculations.

House price developments have been closely linked to mortgage credit (Graph II.4)⁽⁵³⁾ and mortgage credit developments roughly match the phases identified for house prices at euro area level. However, while mortgage credit growth outpaced house price growth before the GFC, the opposite happened when the COVID-19 pandemic hit.⁽⁵⁴⁾ Even though credit cycles were quite synchronised across euro area countries, the amplitude of the cycles differed significantly (Graph II.5). Several

⁽⁵⁰⁾ The higher share of renovations can be demonstrated by different measures of initiated and completed dwellings, in addition to the discrepancy between building permits and residential investment on GDP that also increased at a slower pace than residential investment.

⁽⁵¹⁾ Cavalleri, M.C., B. Coumède and E. Özsögüt (2019). How responsive are housing markets in the OECD? National level estimates, OECD Economics Department Working Papers No 1589.

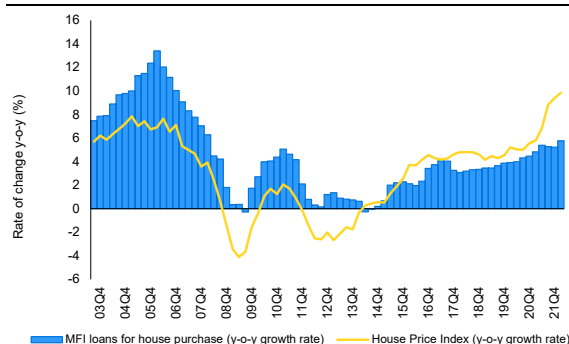
⁽⁵²⁾ In some places, the reconversion of some office areas into residential areas following ongoing changes in working patterns may increase the supply of housing.

⁽⁵³⁾ Cyclical co-movement between house prices, credit and other financial variables has been coined the financial cycle, see Monteiro, D and B. Vašíček (2018). Financial cycle in euro area, *Quarterly Report on the Euro Area*, 2, 17-30.

⁽⁵⁴⁾ This is consistent with the substantial lack of recovery in volumes – as opposed to prices – in the aftermath of the GFC.

Member States that experienced a mortgage boom before the GFC crisis suffered from deleveraging right afterwards. Since then, mortgage credit has risen only slightly across euro area countries.

Graph II.4: House prices and mortgage credit, the euro area

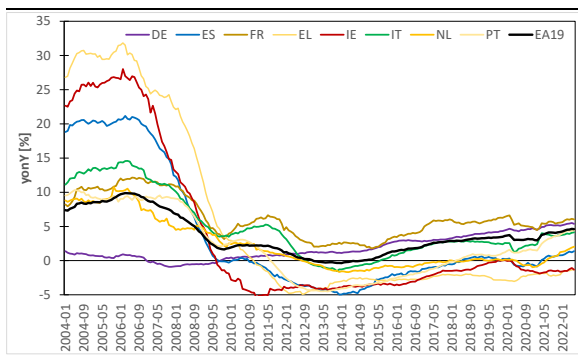


Source: ECB, Eurostat.

During the past decade, the moderate development of mortgage credit can be related to the increasing use of macroprudential measures aimed to limit excessive credit growth, which is a main component of systemic risk for the financial sector.⁽⁵⁵⁾

Borrower-based measures were brought in across the euro area, such as limits on loan-to-value (LTV) and debt-service-to-income ratios (Graph II.6). These measures remained in place in most Member States, even during the COVID-19 pandemic.⁽⁵⁶⁾

Graph II.5: Mortgage credit growth, selected euro area countries



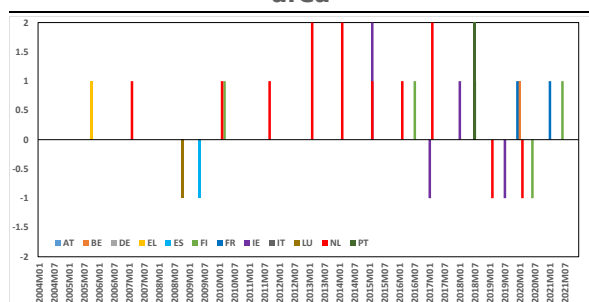
(1) EA-19 is a simple average of respective Member States.

Source: Eurostat, own calculation.

⁽⁵⁵⁾ Cerutti, E., S. Claessens and L. Laeven (2017). The use and effectiveness of macroprudential policies: New evidence, *Journal of Financial Stability*, 28, 203-224.

⁽⁵⁶⁾ ESRB macroprudential database.

Graph II.6: Housing-related borrower-based measures implemented in the euro area



(1) The positive (or negative) unit value indicates tightening (or easing) of LTV or DSTI limits (i.e. 1 is tightening of one measure, 2 is tightening of both measures, and vice versa). Euro area = EA-12.

Source: IMF, ESRB macroprudential database.

II.3. Empirical evidence on the links between housing and the real economy

This subsection provides empirical evidence on the links between the housing market and the real economy in the euro area using a panel Bayesian vector autoregression (BVAR) model.⁽⁵⁷⁾ The dataset covers 12 euro area countries (AT, BE, DE, ES, EL, FI, FR, IT, IE, LU, NL, PT) over the period Q1 2004–Q1 2022. These countries were selected due to data availability for the main variables and euro area membership during the whole sample period.

The panel setting is useful to extend the time data sample, which is limited by the availability of some variables. The baseline model includes seven variables: ⁽⁵⁸⁾ (i) real GDP (annual change in %), (ii) harmonised consumer prices (HICP, annual change in %), (iii) mortgage lending rate (annualised agreed rate for new business, in %), (iv) building permits (annual change in % based on the number of permits for m² of useful floor area), ⁽⁵⁹⁾ (v) mortgage credit (lending for house

purchases, annual change in % of the stock, excluding valuation effects), (vi) credit conditions (annual change in % of the relative ratio between tightening and easing by banks; an increase represents a relative tightening)⁽⁶⁰⁾ and (vii) house prices (annual change in %). The data come from the ECB and Eurostat. All series are stationary, and the underlying series were adjusted seasonally (and by working day) at the source or by applying the TRAMO/SEATS methodology. The extended model also uses alternatively ^(viii) a macroprudential policy index⁽⁶¹⁾ and ^(ix) a monetary policy shadow rate (see details below).

The empirical results confirm that there are significant links between the real economy and the housing sector at euro area level, which is intermediated by the banking sector. Graph II.7 shows the impulse response function (IRF) of the seven variables included in the baseline panel BVAR model (the columns show the shocked variables, and the rows show the responses).⁽⁶²⁾

the future development of construction activity in terms of square metres. A building permit is an authorisation to start work on a building project. As such, a permit is the final stage of planning and building authorisations from public authorities, prior to the start of work¹.

⁽⁶⁰⁾ The ECB surveys credit conditions quarterly for all euro area banks (loans for house purchases by household); for details see Box in ECB, Euro area bank lending survey – Second quarter of 2022, July 2022.

⁽⁶¹⁾ The IMF's iMaPP database provides dummy-type indicators of tightening and loosening decisions on various macroprudential policy instruments at monthly frequency. Namely, we sum all the decisions regarding the LTV and DSTI limits into a single index each quarter. The database is described in Alam, Z., M. A. Alter, J. Eiseman, M. R. Gelos, M. H. Kang, M.M. Narita, and N. Wang (2019). Digging deeper, Evidence on the effects of macroprudential policies from a new database. International Monetary Fund Working Paper, No 19/66. For 2021, we use data from the ESRB database of macroprudential measures and sum them up in the same way with the IMF database.

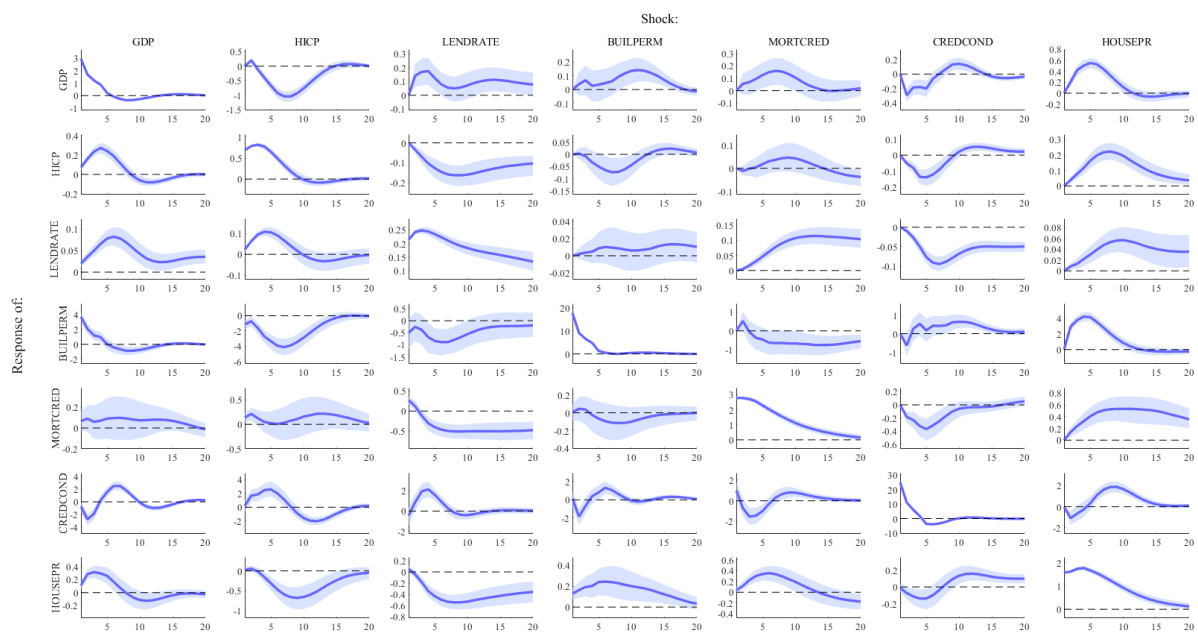
⁽⁶²⁾ A pooled estimator is used with normal Wishart prior (hyperparameters are set as follows: autoregressive coefficient: 0.8, overall tightness: 0.1, cross-variable weighing: 0.5, lag decay: 1). The reported impulse-response functions rely on the Cholesky factorisation, where results depend on the ordering of variables used in the VAR model. However, alternative orderings produce almost identical results. We use for some variables (annual) changes rather than levels (e.g. annual house price changes of house prices index rather than the price index itself) so that they are stationary. We use annual rather than quarterly changes as the aim of our analysis is to track longer-term developments (rather than to forecast trends). While the annual changes of the variables tend to produce more persistent responses, the sign and statistical significance is the same as with quarterly changes. Moreover, with variables defined in yearly changes, the ordering of variables in the VAR model has a much lower impact on impulse-response analysis than with quarterly changes.

⁽⁵⁷⁾ The BEAR toolbox for Matlab [ver. 5.2] is used to make all estimations. See <https://www.ecb.europa.eu/pub/research/working-papers/html/bear-toolbox.en.html>.

⁽⁵⁸⁾ This model is an extension of the simple panel bivariate BVAR analysis with house prices and mortgage credit used in Martins et al. (2021). The variables are ordered in the baseline VAR as listed, i.e. from (i) to (vii). Namely, the first three variables follow the ordering of standard monetary VARs, namely output, prices and interest rates. The ordering of the remaining four variables is less straightforward but we use yearly changes of the variables where the ordering of variables is less relevant (see Footnote 61).

⁽⁵⁹⁾ Eurostat defines it as ‘the objective of the number of dwelling building permit index is to show the future development of construction activity in terms of residential units, while the objective of the useful floor area building permit index to show

Graph II.7: Impulse response function from baseline panel BVAR, 12 euro area countries



Source: Authors' calculation based on ECB and ESTAT data.

A positive **GDP** shock,⁽⁶³⁾ which can be also interpreted as an income shock (*first column*), has an immediate positive effect on building permits. It eases credit conditions and pushes up house prices (and mortgage credit, though insignificant). With a delay of around two quarters, the positive GDP shock leads to a peak in mortgage lending rates and a tightening of credit conditions.

An **inflation** shock (*second column*) triggers a gradual drop in economic activity (GDP, building permits). It leads to an increase in mortgage lending rates, tightening credit conditions and, with some delay, a fall in house prices.

A shock to **lending rates** (*third column*) leads to a tightening of credit conditions and a drop in building permits, mortgage credit and house prices.

A positive shock to **building permits** (*fourth column*) has less of a statistically significant impact on other variables, except for GDP and house prices, both of which are boosted. The lack of significant impact may come from the fact that building permits are only a proxy variable (intention to build vs actual construction), while

the counterintuitive response seen in house prices may be associated with the housing boom before the GFC when in several Member States both building permits and house prices grew at the same time.

A positive shock to **mortgage credit** (*fifth column*) leads, in the short-term, to an easing of credit conditions and an increase of house prices. With some delay, it also pushes up GDP and lending rates.

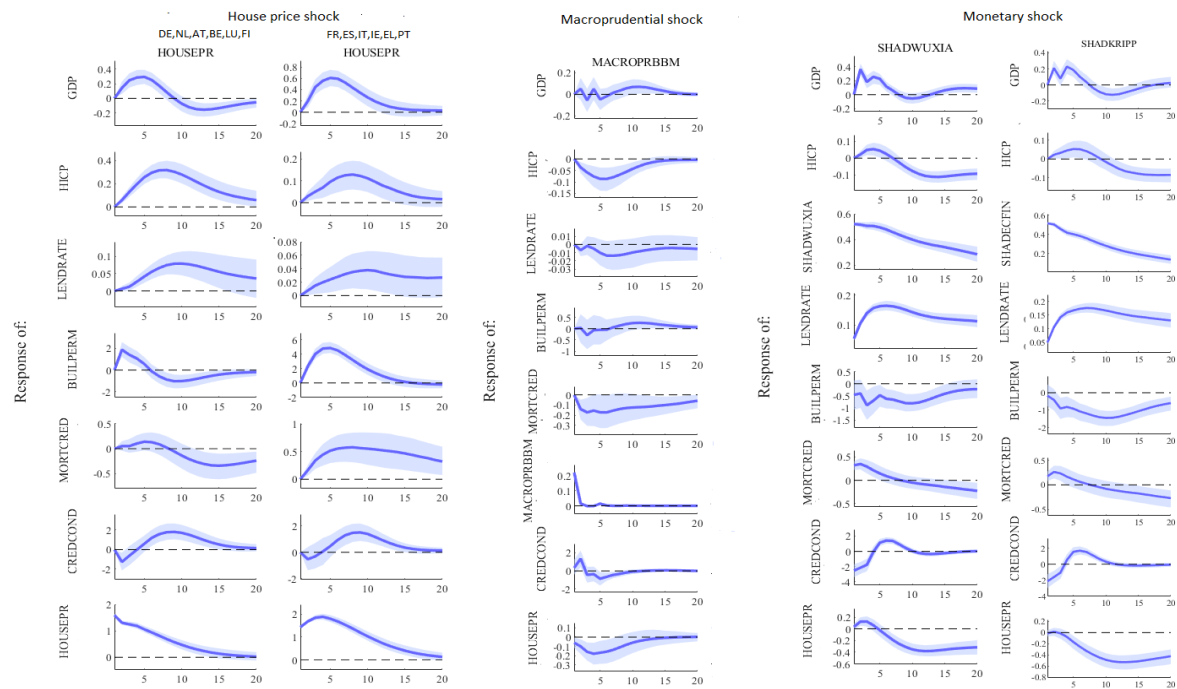
A positive shock (i.e. tightening) to **credit conditions** (*sixth column*) has a short-term negative effect on mortgage credit, consumer and house prices and GDP and in the medium-term is followed by a drop in lending rates.

Finally, a positive shock to **house prices** (*seventh column*) results in a quick increase in building permits, mortgage credit and GDP. With some delay it leads to higher consumer prices, mortgage rates and a tightening of credit conditions.

Housing market developments differed significantly across euro area countries over the last two decades. Notably, housing markets experienced boom and bust dynamics in some Member States during the GFC but in others they exhibited greater stability.

⁽⁶³⁾ The impulse-response functions measure the effect of a shock to an endogenous variable on itself and on the other endogenous variables. The shock shall be understood as an unexpected innovation (i.e., autonomous change) of each variable (of size of one standard deviation).

Graph II.8: Impulse response function from different panel BVARs, 12 euro area countries



Source: Authors' calculation based on ECB and ESTAT data.

To shed some light on possible differences in the links between house prices and the real economy in the two groups of countries, we carried out an analysis on *two subsamples of Member States*, the first consisting of AT, BE, DE, FI, LU, NL and the second consisting of EL, ES, FR, IE, IT, PT. ⁽⁶⁴⁾ Graph II.8 (*left panel*) shows responses to a house price shock. While the IRFs are broadly consistent for both groups, the second group of countries shows a much stronger increase in building permits, mortgage credit and GDP following a positive house price shock. In other words, a negative house price shock observed after the GFC implied a faster fall of these variables in the second group of countries.

Results also indicate that building permits respond significantly strongly to other shocks (e.g. GDP shock) for the second group of countries. Likewise,

a shock to building permits causes significantly stronger responses in other variables (e.g. GDP). This could indicate that differences in supply-side elasticity across euro area countries (captured here by the differences in building permitting) affect the transmission of shocks between house prices, mortgage credit and the real economy. Namely, higher housing supply elasticity reinforces the link between the housing market and the real economy. This link can be potentially destabilising when a boom-bust dynamic sets in. ⁽⁶⁵⁾

The link between housing, mortgage credit and the real economy may also have changed since the GFC, as *new macroprudential tools* were brought in to prevent excessive credit provision. Graph II.8 (*middle panel*) shows the responses of the variables to a macroprudential shock from the panel BVAR model extended with a macroprudential index tracking *borrower-based measures* (BBM) targeting the housing market, ⁽⁶⁶⁾ i.e. changes to loan-to-value

⁽⁶⁴⁾ While there are some evident cases of Member States experiencing boom and bust dynamics during the GFC (such as ES, EL, IE, PT and others seem not to be affected at all (e.g. AT, DE)). To create these two subsamples, three main housing-related variables (house prices, building permits and mortgage credit) were analysed in terms of their standard deviation. The countries were ranked accordingly for each of the three variables and the sample of twelve countries was split into two groups of equal size. The split was consistent across the three variables except for FR and NL, which represent borderline cases. However, their pairwise exchange across the two groups does not change results.

⁽⁶⁵⁾ The time series are too short to run individual country VARs. Specifically, as the time sample is very short, the confidence bands are very wide. Still, some of the key results are confirmed at country level. For example, the house price shock and the GDP shock trigger a much stronger response of building permits in ES than in DE.

⁽⁶⁶⁾ The analysis includes only BBM as opposed to broader capital or liquidity macroprudential measures as the former have the direct

(LTV) and debt-service-to-income (DSTI) limits. ⁽⁶⁷⁾

These results confirm that a positive macroprudential shock (tightening) dampens both mortgage credit and house prices, but it has no significant impact on GDP. ⁽⁶⁸⁾ The same analysis repeated for the two groups of countries (not shown here), confirms the important role of housing supply elasticity. In the second group of countries (EL, ES, FR, IE, IT, PT), macroprudential tightening triggers a fall in building permits, but not in the first group (AT, BE, DE, FI, LU, NL). Likewise, house prices fall in the second group of countries following macroprudential tightening but not in the first group, where instead the negative response of mortgage credit is more pronounced. ⁽⁶⁹⁾

Lastly, there has been some discussion about the links between housing markets and *monetary policy*. The ongoing discussion is on how house price developments are affected by the monetary policy stance and how housing market conditions affect the transmission of monetary policy to the real economy. Graph II.8 (*right panel*) shows the responses to a monetary policy shock using the panel BVAR model extended by two alternatives measures of the euro area shadow rate, ⁽⁷⁰⁾ namely the one put forward by Wu-Xia ⁽⁷¹⁾ and another

estimated by Krippner. ⁽⁷²⁾ To illustrate the level of actual market rates, the graph also shows the three-month interbank interest rate.

The results are subject to a high degree of uncertainty as shadow rates are only proxies for the ECB's monetary policy stance (which reflects different policy tools). ⁽⁷³⁾ They suggest that monetary policy has the predicted effect on the housing market. A positive monetary shock (tightening) is followed by an increase in lending rates and a decrease in building permits, mortgage credit and house prices. ⁽⁷⁴⁾ In turn, monetary policy seems to respond to mortgage credit shocks and house price shocks (not shown here). The analysis of the two groups of countries confirms that supply elasticity also plays a role in monetary transmission. In other words, after monetary tightening, there is a sharper decrease in building permits and house prices in the second group (EL, ES, FR, IE, IT, PT).

These results suggest that the long period of very accommodative monetary policy (when the shadow rates were deeply negative) (see Graph II.9) has had an impact on house price dynamics. ⁽⁷⁵⁾ Likewise, the ongoing monetary tightening is likely to cool down housing demand. However, the ultimate impact on prices will also depend significantly on the housing supply in times of uncertainty (including increasing energy and building material prices).

aim to prevent real-estate related risks. Empirical evidence (see Footnote 70 below) commonly uses LTV and/or DSTI limits.

⁽⁶⁷⁾ This variable is ordered after mortgage credit assuming that macroprudential policy responds on impact to mortgage credit but not vice versa, i.e. that the application of new macroprudential measures is delayed.

⁽⁶⁸⁾ Similar findings were reported using a broader sample of countries by Andrieș, A. M., F. Melnic and N. Sprincean (2021). The effects of macroprudential policies on credit growth, *The European Journal of Finance*, 28(10), 1-33 and Poghosyan, T. (2020). How effective is macroprudential policy? Evidence from lending restriction measures in EU countries. *Journal of Housing Economics*, 49, 1016-94. The ambiguous effect of a macroprudential shock on GDP is consistent with Richter, B., M. Schularick and I. Shim (2019). The Costs of Macroprudential Policy, *Journal of International Economics*, 118, 263-282 who find that tightening LTV limits affect house prices and growth of household debt, but in advanced economies they have only small effect on output and inflation.

⁽⁶⁹⁾ There is no evident ranking of countries by housing supply elasticity. Again, there are only evident cases of elastic supply such as EL, IE and cases of inelastic supply such as NL, LU.

⁽⁷⁰⁾ The use of a shadow rate as a proxy for monetary policy is necessary given the period of unchanged very low (zero) or even negative interest rates. Shadow rates is ordered after the GDP and before HICP as monetary policy rate in a standard monetary VAR model.

⁽⁷¹⁾ For details on the shadow rate see Wu, J. C. and F. D. Xia (2017). Time Varying Lower Bound of Interest Rates in Europe, Chicago Booth Research Paper No 17-06, April 2017 and Wu, J. C. and F. D. Xia (2020). Negative Interest Rate Policy and Yield Curve, *Journal of Applied Econometrics*, 35 (6), 653-672.

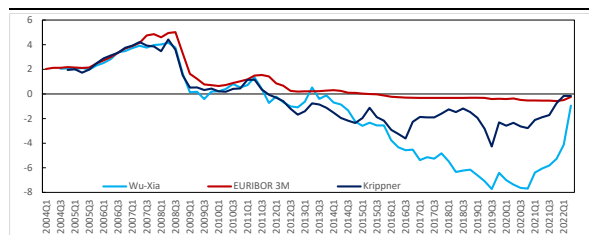
⁽⁷²⁾ For details on this shadow rate, see Krippner, L. (2012). Measuring the stance of monetary policy in zero lower bound environments, *Economic Letters*, 118, 135-138; Krippner, L. (2014). Measuring the stance of monetary policy in conventional and unconventional environments, CAMA Working Papers, Centre for Applied Macroeconomic Analysis, Crawford School of Public Policy, the Australian National University.

⁽⁷³⁾ Since the shadow rate is an estimate, there is uncertainty around its value, and different measures of shadow rates can provide a somewhat different picture. Consequently, two different measures of shadow rates are used. However, the VAR estimates of monetary policy shock using shadow rates are subject to significant uncertainty that cannot be traced by standard confidence intervals.

⁽⁷⁴⁾ The counterintuitive temporary increase of GDP, inflation and mortgage credit following monetary tightening (which holds for both measures of shadow rates and both for VAR in yearly and quarterly changes) is largely driven by the erratic behaviour after the pandemic. When these data are excluded, the increase of GDP and credit is only minor, while the consecutive decline is more pronounced. Moreover, monetary policy is effective only over the medium term, i.e. after two years, all the variables give the expected negative response.

⁽⁷⁵⁾ This is consistent with recent evidence by Hülsewig, O. and H. Rottmann (2021). Euro area house prices and unconventional monetary policy surprises, *Economics Letters*, 205, 109962 showing that the unconventional monetary policy of the ECB contributed to the rise in house prices in the euro area.

Graph II.9: Shadow policy rate estimates and EURIBOR for the euro area



(1) EURIBOR 3M = 3-month interbank borrowing interest rate in the euro area (quarterly average); Wu and Xia and Krippner shadow rates are based on alternative models; shadow rate values shown correspond to the last month of a quarter (as of September 2022).

Source: Bloomberg, ECB, Wu-Xia and own calculations.

II.4. Conclusions

House prices in the euro area have increased persistently since the beginning of the recovery in 2013 and accelerated since the COVID-19 pandemic. However, over a longer period, house prices in the Member States have shown different patterns due to country-specific economic developments, housing market structures and policy factors (e.g. building regulations and housing-related taxation).

The analysis of this section confirms that there are significant links between housing market developments and the real economy at the euro area level. It also confirms that the strength of these links depends on housing supply elasticity (as proxied by the variability of building permits). In line with anecdotal evidence, stronger links between housing markets and the economy are found in the Member States that experienced turbulent house prices during the GFC. These are the economies where housing permits respond more to increases in house prices.

The analysis also confirms the efficiency of borrower-based macroprudential measures on target variables (both house prices and mortgage credit) with limited collateral effect on economic activity. Looking at the dynamics within the euro area, different responses to macroprudential tightening are found between the same two groups of countries. The changes in monetary policy stance of the ECB are found to have an impact both on house prices and on mortgage credit in the euro area. However, links between monetary policy and housing markets are subject to large uncertainty given the prolonged period when unconventional monetary policy measures were employed.

Housing supply elasticity seems to play a crucial role in the nexus between housing and the real economy. It is determined by multiple country-specific factors, most notably land-use regulations and building regulations.⁽⁷⁶⁾ In terms of macroeconomic outcomes, supply elasticity is a double-edged sword though. The responsiveness of housing supply to demand pressures is needed to make housing affordable. In countries where the supply is very staggered, the risk of a major downward correction and thus a boom-bust cycle is more contained. But high prices and low housing affordability have an adverse impact on the labour market, productivity, and the equality of wealth distribution. Conversely, flexible housing supply makes large expansions or contractions of construction activity driven by changes in mortgage credit and house prices possible, with (corresponding) implications for the whole economy.⁽⁷⁷⁾

The model presented in this section is mainly helpful in understanding pre-pandemic house price developments. The effects of the pandemic brought about some unusual developments. First, house prices have accelerated further since the beginning of the pandemic, in stark contrast with previous recessions. This seems to be driven by persistent demand, by favourable funding conditions and by changes in housing preferences. Second, housing supply was further constrained by the pandemic measures. Multiple sources of uncertainty are weighing on economic activity, inflation is running high and credit conditions are tightening. Given the persisting housing supply constraints, even a drop in demand for housing is unlikely to result in a significant downward correction of house prices. Nevertheless, high house prices and tighter access to credit are likely to have a negative effect on the affordability of housing, which has significantly deteriorated in recent years across the EU.⁽⁷⁸⁾

⁽⁷⁶⁾ Cavalleri, M. C., B. Coumède, B. and E. Özşögüt (2019). How responsive are housing markets in the OECD? National level estimates, OECD Economics department Working Papers, No 1589.

⁽⁷⁷⁾ Such swings lead to changes in the allocation of resources between tradable and non-tradable sector which can hurt potential growth, erode competitiveness and widen intra-EA imbalances. See Rey, H. (2012). The Euro's Three Crises: *Brookings Papers on Economic Activity*, 43 (1), 219–26.

⁽⁷⁸⁾ Frayne, Ch., A. Szczypińska, B. Vašíček and S. Zeugner (2022). Housing Market Developments in the Euro Area: Focus on Housing Affordability, *European Economy – Discussion Papers*, forthcoming.