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Euro area house price fluctuations and unconventional monetary policy surprises

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Euro area house price fluctuations and unconventional monetary policy surprises

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Abstract

This paper examines the reaction of house prices in a panel of euro area countries to monetary policy surprises over the period 2010-2019. Using Jordà's (2005) local projection method, we find that house prices rise in response to expansionary monetary policy shocks that can be related to unconventional monetary policy measures. Thus, monetary policy should take into account the risk of house price fluctuations when implementing new large scale policy interventions.

Key words: House price fluctuations, unconventional monetary policy, local projection method

JEL Codes: E52, E58, E32, G21

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1 Introduction

Empirical research on the side-effects of loose monetary policy points to financial instability risks. In particular, housing busts in response to a surge in house prices due to low interest rates might be a potentially destabilizing byproduct of continuous easy money (Jordà et al., 2015). Thus, policymakers should be mindful of such risks when implementing expansionary measures.

In this paper, we examine the effect of the European Central Bank's (ECB) monetary policy on euro area house price fluctuations over the period 2010-2019, i.e. after the onset of the sovereign debt crisis. The period covers the introduction of numerous unconventional monetary policy measures such as sovereign bond purchases under the Securities Market Programme (SMP) and the Asset Purchasing Programme (APP), the announcement of the Outright Monetary Transaction (OMT) Programme, as well as several long-term refinancing operations (LTROs) with extended maturities, full allotment and reduced collateral requirements. We use Jordà's (2005) local projection method to analyze the reaction of house prices, mortgage loans and mortgage lending rates to surprises in monetary policy that can be related to unconventional measures. We refer to the shock series of Leombroni et al. (2020), Jarociński and Karadi (2020) and Kerssenfischer (2019) to identify monetary policy innovations. Since our sample is short we adopt panel techniques.

Our results suggest that the ECB's monetary policy interventions contribute to house price fluctuations. We find that house prices rise after expansionary shocks to monetary policy. The increase can be observed both in the core countries of the euro area including Ireland and in the Mediterranean countries. Moreover, in the core countries, we also observe that lending for house purchases increases relative to nominal output in response to the shocks. Therefore, we conclude that monetary policy should take into account the risk of price surges in the housing market when implementing new large scale unconventional interventions, such as the recent re-activation of the APP and the launch of the Pandemic Emergency Purchasing Programme (PEPP) in 2020.

Related Literature: Several studies explore the link between house prices, mortgage borrowing and monetary policy (Goodhart and Hofmann, 2008; Jarocinski and Smets, 2008; Jordà et al., 2015, among many others). The findings suggest that house prices rise after expansionary shocks to standard monetary policy that lower mortgage lending rates by inducing short-term interest rates to decline. The surge in house prices along with a rise in household debt heighten the risk of a financial crisis (Mian and Sufi, 2018). Our analysis contributes to this literature by focusing on the effect of monetary policy measures that include non-standard interventions.

The remainder of the paper is organized as follows. Section 2 sets out our baseline model, introduces the data and discusses the shock series that we take from

the literature to identify exogenous monetary policy surprises. In Section 3, we present our results. Section 4 concludes.

2 Methodology, data and monetary policy shocks

2.1 Baseline model

We use Jordà's (2005) local projection method for estimating impulse responses. The linear model is given by:

$$X_{i,t+h} = \alpha_{i,h} + \theta_h \text{MP}_t + \phi_h'(L) Z_{i,t-1} + u_{i,t+h} \tag{1}$$

where $X_{i,t+h}$ is the variable of interest, subindex i denotes the country, MP_t is an exogenous monetary policy shock, $\alpha_{i,h}$ captures country-specific fixed effects, $Z_{i,t-1}$ is a vector of control variables, $\phi_h(L)$ is a polynomial in the lag operator and $u_{i,t+h}$ denotes an error term. First, the variable of interest is the log of the real house price.[1] The vector of control variables includes lags of the real house price in logs, the log of residential investment, the mortgage lending rate and the shadow short rate, which serves as a proxy for the stance of monetary policy. Moreover, as additional variables of interest we use the nominal house price index relative to the index of nominal output per capita, the outstanding volume of domestic mortgage loans relative to nominal output and the mortgage lending rate. In these cases, the vector of control variables includes lags of these variables, lags of residential investment relative to nominal output and the shadow short rate. All models are estimated with a lag length of two.[2]

The response of X at time $t+h$ to a monetary policy shock at time t is given by the estimated coefficient θ_h. Thus, the impulse responses are derived by estimating a series of single regressions for each horizon $h = 0, 1, 2, 3...H$ to generate a sequence of the θ_h's. We use the method of Driscoll and Kraay (1998) to obtain heteroskedasticity-consistent standard errors that are robust to very general forms of spatial and temporal correlations. We set the maximum autocorrelation lag to $H+1$.

2.2 Data and exogenous monetary policy surprises

Since the sample is short, we use panel data (Jordà et al., 2015). Our set of countries comprises Austria, Germany, Spain, Finland, France, Ireland, Italy, the Netherlands

[1] We derive real house prices by deflating the index of nominal house prices with the GDP deflator.

[2] We check robustness by also considering higher lag orders.

and Portugal.[3] The data is taken from the ECB, Eurostat and the Bank of International Settlements, and collected on a quarterly basis covering the period from 2010Q1 to 2019Q3. Furthermore, we consider exogenous monetary policy surprises. We refer to Leombroni et al. (2020), who identify pure risk premium shocks of monetary policy communication that summarizes information about new policies, such as asset purchases, liquidity supports, or lending and refinancing operations. Additionally, we use the shock series of Jarociński and Karadi (2020) and Kerssenfischer (2019), who derive pure monetary policy shocks by extracting the information contained in high frequency data. Table 1 summarizes the periods over which the shock series are available. We standardize the shock series to have a mean of zero and a

Table 1: Shock series periods

Leombroni et al. (2020)	2010Q1-2019Q4
Kerssenfischer (2019)	2010Q1-2018Q4
Jarociński and Karadi (2020)	2010Q1-2016Q4

standard deviation of one. Moreover, we normalize the shocks so that they reflect a monetary loosening.

3 Empirical results

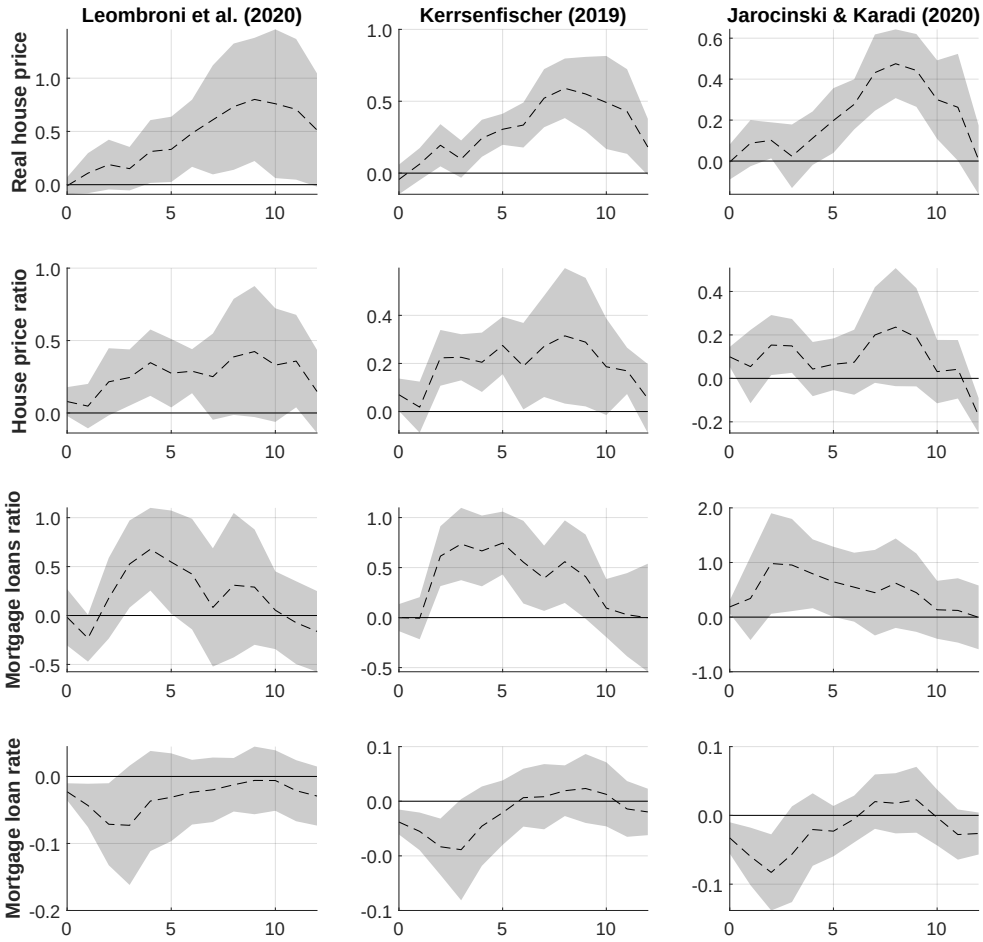
3.1 Baseline model impulse responses

Figure 1 shows the reaction of the variables of interest to the exogenous monetary policy shocks. The dashed lines are the estimated impulse responses. The shaded areas reflect the 90% error band.

We observe that the reaction of the variables to the monetary policy shocks derived from the series of Leombroni et al. (2020), Jarociński and Karadi (2020) and Kerssenfischer (2019) are comparatively similar. The real house price rises after an unexpected monetary policy loosening. The average peak response is 0.6%. The nominal house price ratio, i.e. the index of nominal house prices relative to the index of nominal output per capita, also increases. Moreover, the volume of domestic mortgage loans rises relative to nominal output. Thus, household debt expands. The mortgage lending rate declines temporarily. Overall, we find that shocks to monetary policy contribute to house price fluctuations.

[3] We exclude Belgium due to a lack of residential investment data. Moreover, we exclude Greece because it obtained external finance through financial aid programmes from May 2010 onwards. External financing through capital markets did not take place, while at the same time sovereign bond rates increased tremendously. In addition, Greek government bonds were ineligible for the APP over the entire net asset purchase phase.

Figure 1: Baseline model impulse responses to monetary policy shocks



Notes: Impulse responses to exogenous standardized monetary policy shocks that reflect a monetary loosening. The dashed lines are the estimated impulse responses. The shaded areas reflect the 90% error band. See the text for further explanations.

Figure 2: Country groups' impulse responses to monetary policy shocks

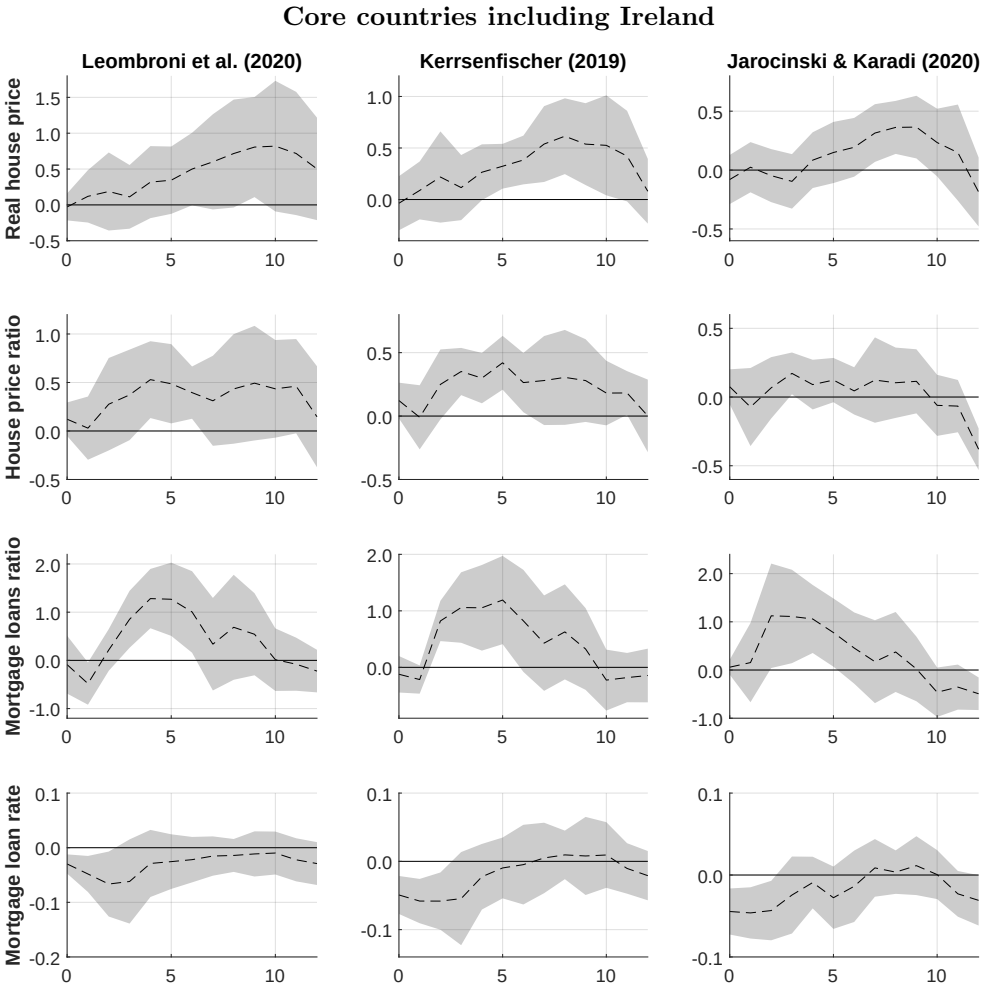
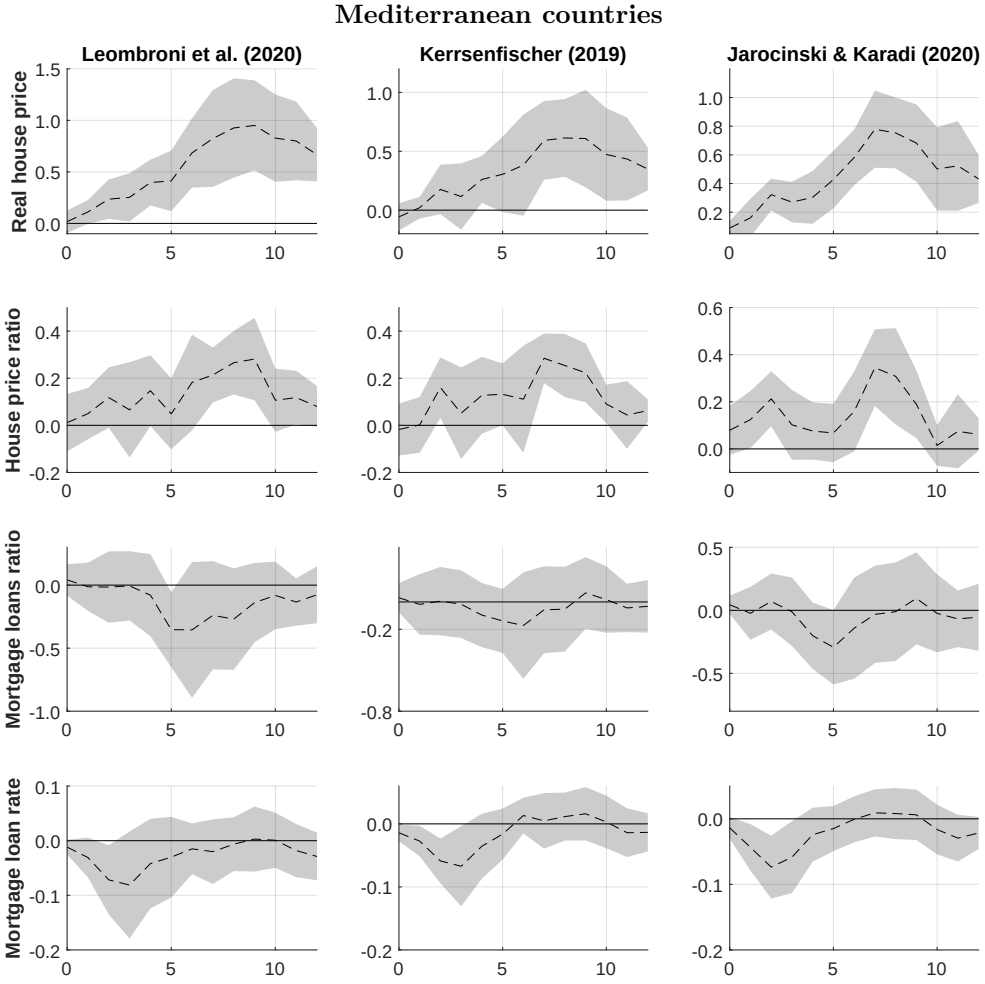


Fig. 2 continued



Notes: See Figure 1 for explanations.

3.2 Country groups

We proceed by building country groups. We distinguish between the core countries including Austria, Germany, the Netherlands, Finland and additionally Ireland, and the Mediterranean countries, which comprise France, Italy, Spain and Portugal. Figure 2 displays the country groups' impulse responses to expansionary monetary policy innovations.

Real house prices in both country groups rise in response to the shocks. Moreover, the reaction of the nominal house price ratio across the country groups seems to be quantitatively similar. Additionally, we observe that in the core countries, the volume of loans for house purchases rise relative to nominal output. Hence, in these countries, household debt increases significantly after an unexpected monetary loosening. In the Mediterranean countries, by contrast, a rise in household debt relative to nominal output cannot be observed.

4 Conclusion

We analyze how the ECB's monetary policy measures implemented between 2010 and 2019 contributed to house price fluctuations across euro area countries. We find that real house prices rise after expansionary shocks to monetary policy that can be related to unconventional interventions. Moreover, nominal house prices increase relative to nominal output per capita. In the core countries including Ireland, we additionally observe that lending for house purchases rises relative to nominal output. Thus, household debt increases. We conclude that monetary policy should take into account the risk of price surges in the housing market when implementing new large scale policy interventions.

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Appendix

A Data

Bank of international Settlements:

- Nominal house prices, index 2010 = 100
  `Q:XX:N:628`

Eurostat:

- Gross domestic product at market prices: current prices, million euro
  Seasonally and calendar adjusted data
- Gross domestic product at market prices: current prices, euro per capita
  Unadjusted data (i.e. neither seasonally adjusted nor calendar adjusted data)
- Gross fixed capital formation, dwellings, current prices, million euro
  Seasonally and calendar adjusted data

ECB Statistical data Warehouse:

- Volume of domestic mortgage loans: outstanding amounts, end of period
  `BSI.M.XX.N.A.A22.A.1.U6.2250.Z01.E`
  Quarterly data is derived by using end of monthly data
- Domestic mortgage lending rate
  `MIR.M.XX.B.A2C.A.R.A.2250.EUR.N`
  Quarterly data is derived by calculating monthly averages

In the series' codes, XX is a placeholder for the country acronym: Austria (AT), Belgium (BE), Germany (DE), Spain (ES), Finland (FI), France (FR), Ireland (IR), Italy (IT), Portugal (PT) and the Netherlands, respectively. Non-seasonally adjusted data is seasonally adjusted by means of the IRIS Macroeconomic Modeling Toolbox.

Shadow short rate:

- Leo Krippner's shadow short rate is taken from: `https://www.ljkmfa.com/`.

Monetary policy shock series:

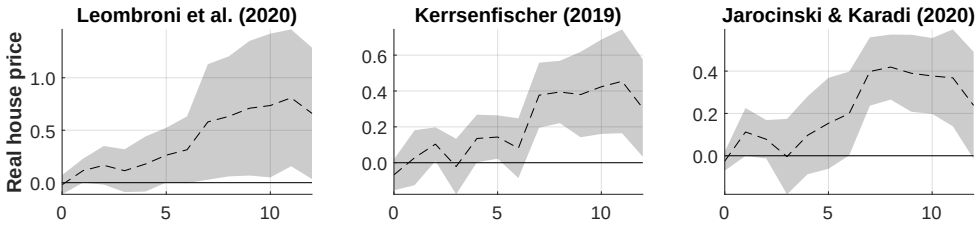
- Leombroni et al. (2020):
  https://sites.google.com/site/gyuriventer/
- Jarociński and Karadi (2020):
  https://www.aeaweb.org/articles?id=10.1257/mac.20180090
- Kerssenfischer (2019):
  https://sites.google.com/site/markkerssenfischer.

Quarterly shock series are calculated by means of the sum over the respective months.

B Additional Figures

B.1 Real house prices deflated by HCPI

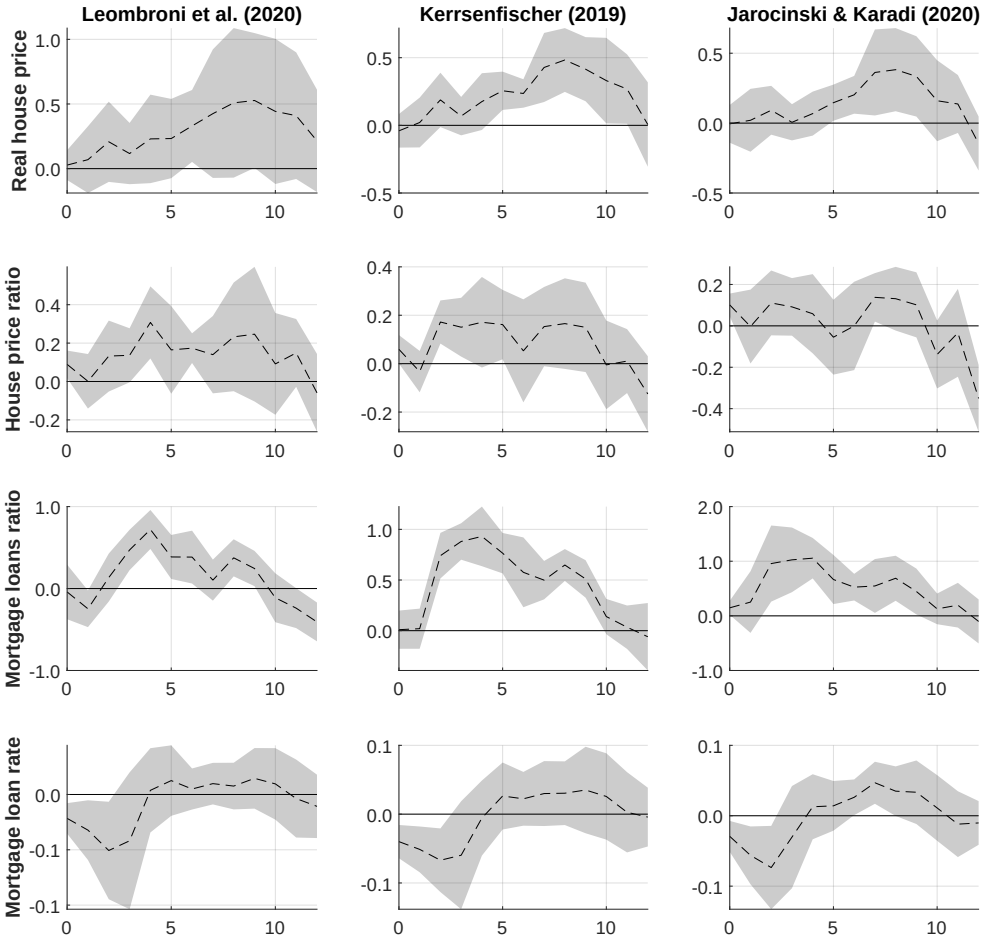
Figure 3: Reaction of real house prices to exogenous monetary policy shocks



Notes: Impulse responses to exogenous standardized monetary policy shocks that reflect a monetary loosening. Real house prices are taken from the Bank of International Settlements and are calculated by using the harmonized consumer price index. All models are estimated with a lag order of two. The dashed lines are the estimated impulse responses. The shaded areas reflect the 90% error band.

B.2 Higher lag order

Figure 4: Baseline model impulse responses to monetary policy shocks



Notes: Impulse responses to exogenous standardized monetary policy shocks that reflect a monetary loosening. All models are estimated with a lag order of four. The dashed lines are the estimated impulse responses. The shaded areas reflect the 90% error band.

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