



EUROPEAN CENTRAL BANK

EUROSYSTEM

Institutional investors and house prices

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30th November, Warsaw

Recent trends in real estate market and its analysis
Narodowy Bank Polski and Warsaw School of Economics



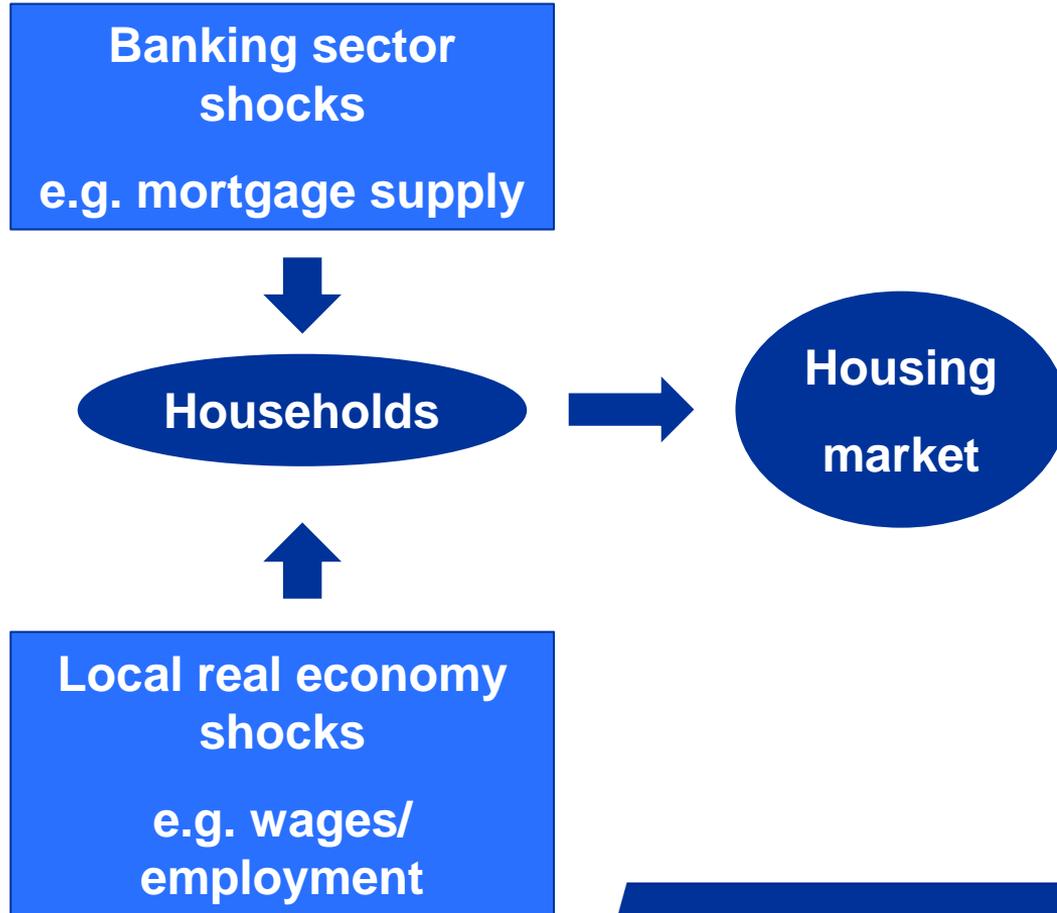
Research question and key findings

We examine the growing role of institutional investors in euro area residential real estate (RRE) markets to understand if and how these players affect market dynamics

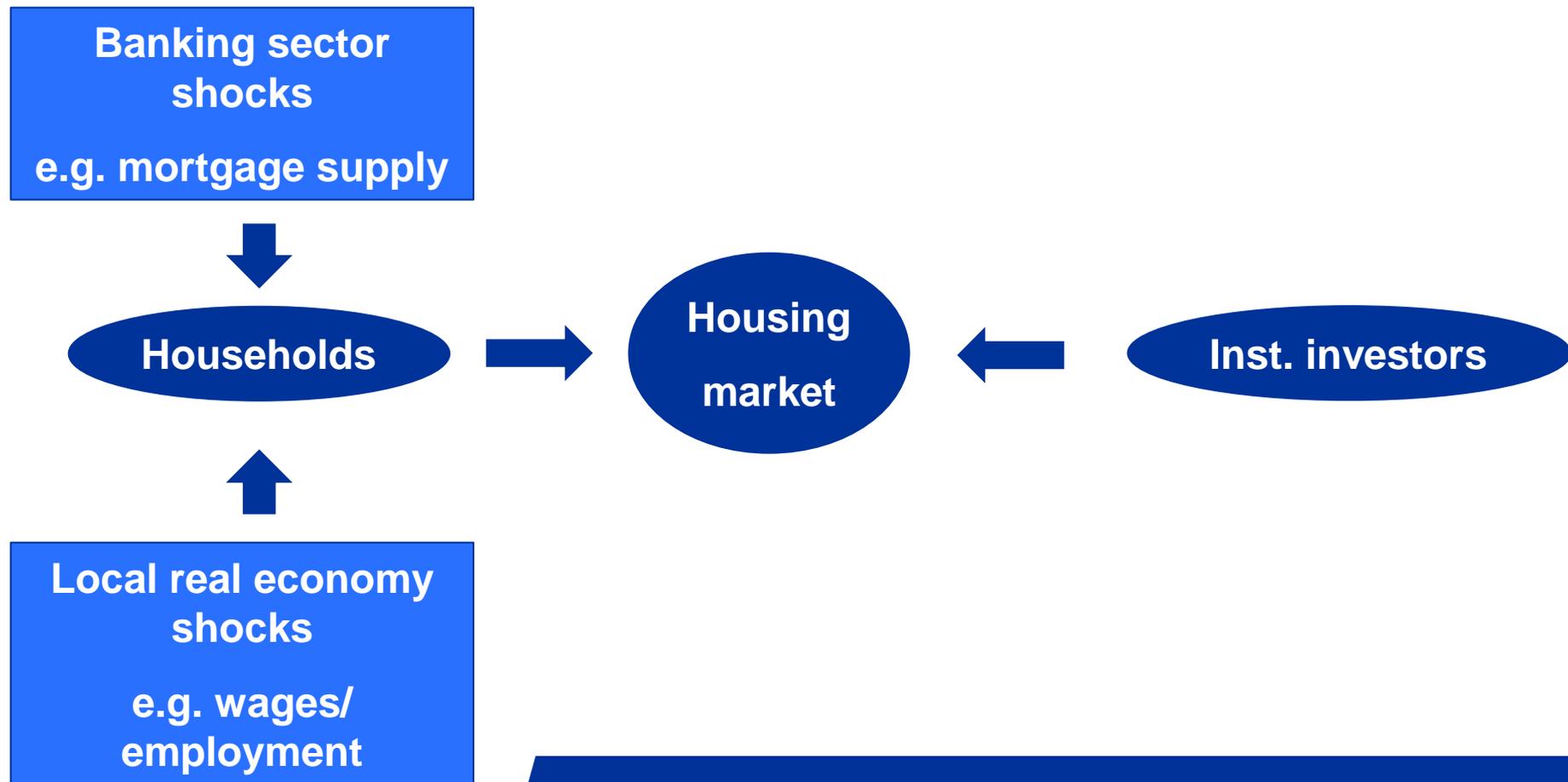
- A. Transactions-level data set:** shows a steady increase in institutional investor purchases of euro area residential real estate assets since 2010
- B. BVAR framework:** 1) increasing (decreasing) institutional investor demand associated with rising (falling) house prices and rising (falling) mortgage growth. 2) Contractionary (expansionary) monetary policy shocks associated with a drop in investor demand.
- C. Regional dynamic panel data analysis:** 1) regions with a higher institutional investor presence have a weaker link between house price growth and local wage growth; 2) monetary policy transmission via house prices appears to be unaffected by the presence of these investors; 3) institutional investors appear to create a link between global/ financial market shocks and house prices

- 1. Motivation and literature**
2. Data set and descriptive statistics
3. Can institutional investors influence aggregate market dynamics?
BVAR analysis
4. Do institutional investors change the way RRE markets behave?
Regional dynamic panel data analysis
5. What does this mean for financial stability and macroprudential policy?

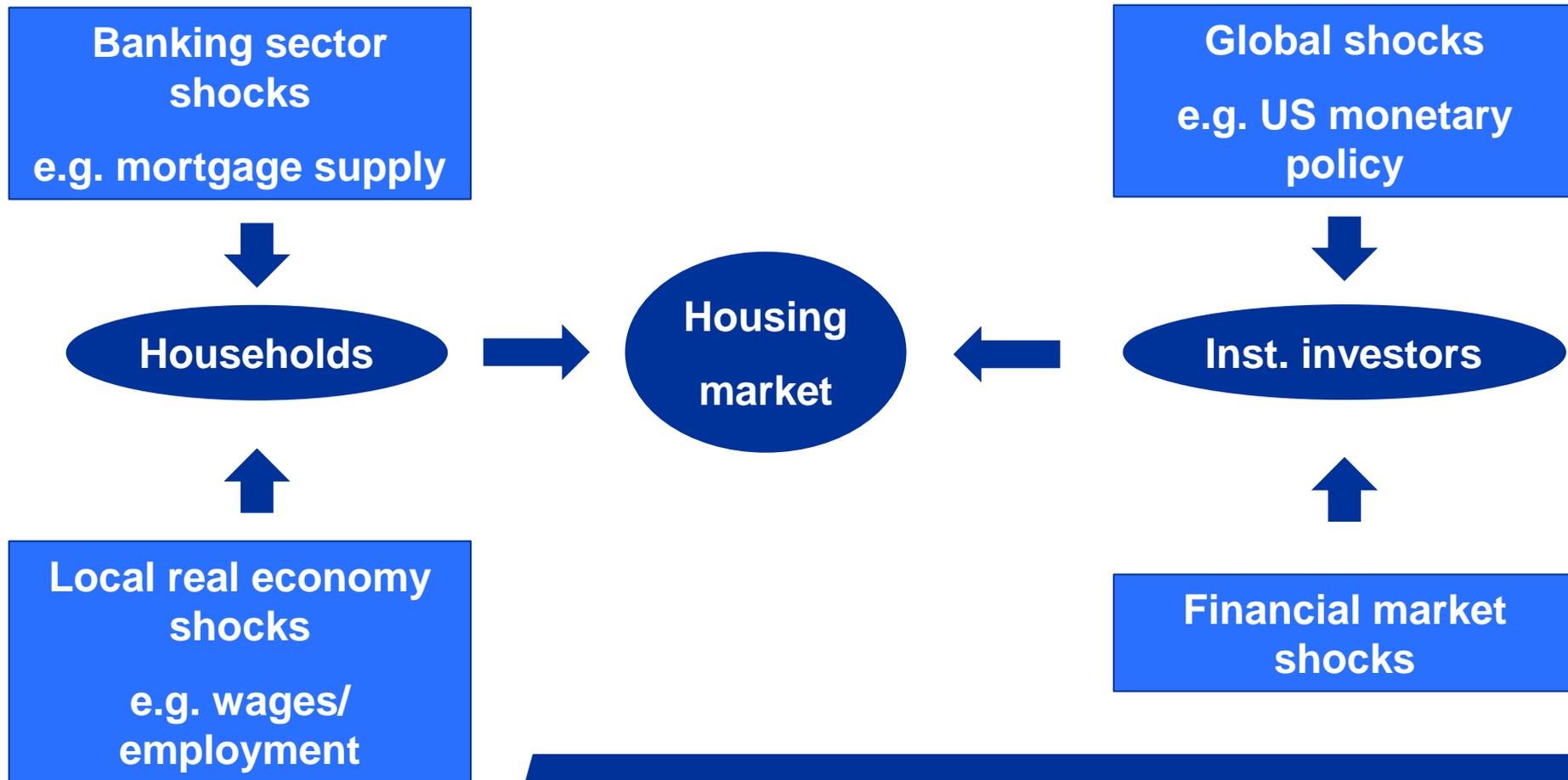
Motivation



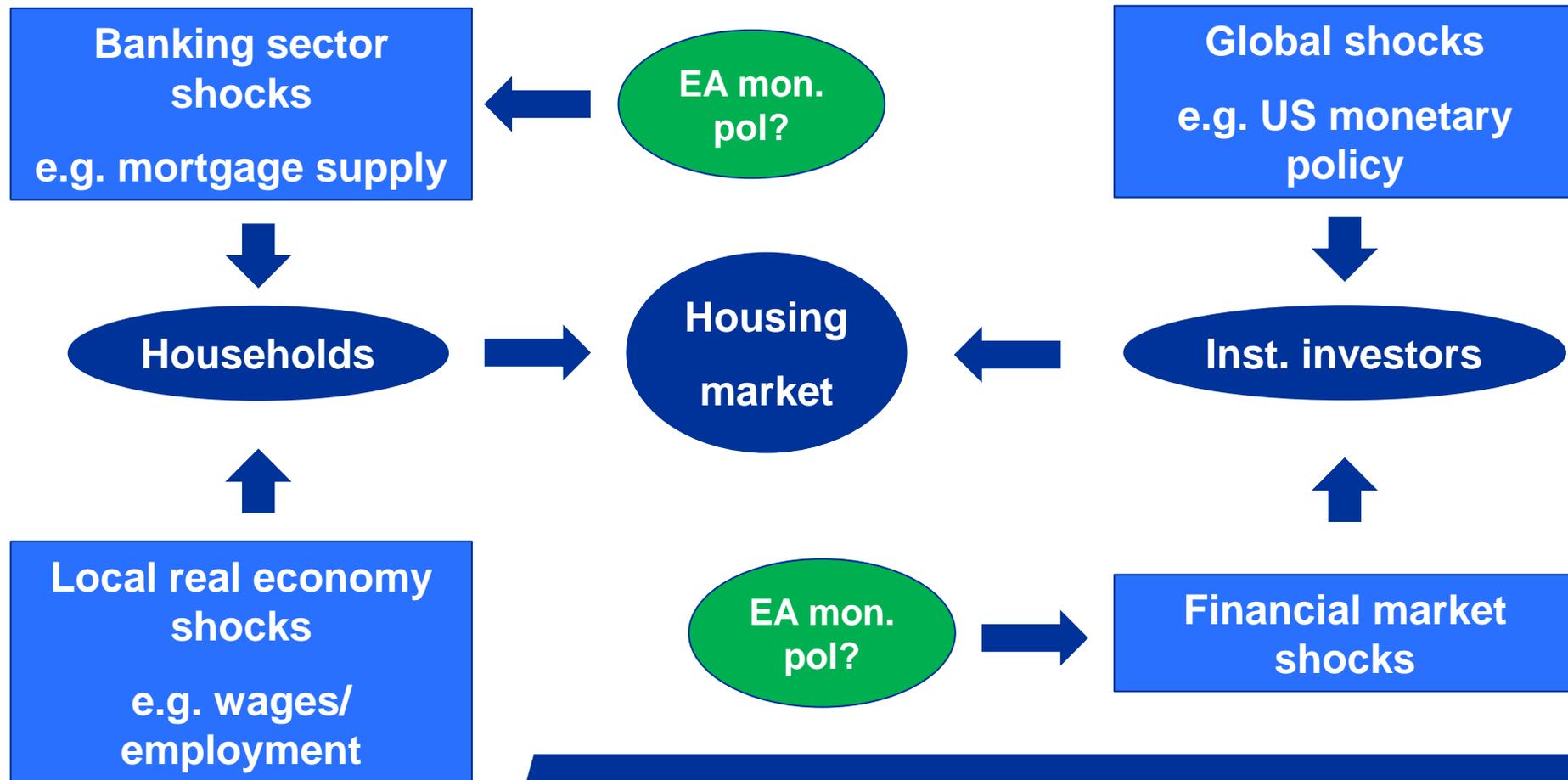
Motivation



Motivation



Motivation



Motivation

- Market made up of only households vs. market made up of households and institutional investors may be exposed to different shocks
- More institutional investors may weaken link between house prices and local real economy
 - **Positive:** Supports real estate market following real economy shocks
 - **Negative:** High investor demand may lead to prices becoming disconnected from fundamentals = overvaluation?
- More institutional investors may create link between financial markets/ vulnerabilities among institutional investors and RRE markets
- What about monetary policy? And international shocks?

What can we learn from the literature?

The presence of institutional investors affects RRE market dynamics – but literature focuses on the US

- The presence of institutional investors in US housing markets is associated to increasing house prices and decreasing affordability and homeownership rates (US: Gay, 2015; Allen et al., 2017; Mills et al., 2019; Lambie-Hanson et al., 2019; Garriga et al., 2021).
- The growth of institutional real estate investments amplified the US real estate boom-bust cycle in the run-up to the global financial crisis (Alter and Dernaoui, 2020; Gao et al., 2020). One reason is that institutional investors have a stronger bargaining power and tend to purchase at a large discount compared to single-purchase buyers (Allen et al., 2017; Smith and Liu, 2020).
- Institutional investors' purchases can have also a spillover effect on nearby home values by reducing the supply of properties available for sale (Ganduri et al., 2023).
- The market entry by large institutional investors also predicts higher uncertainty and greater noise in real estate prices in the short and medium run (US, Cvijanovic, Milcheva and Van de Minne, 2021).

What can we learn from the literature?

Institutional investors' investments in RRE are linked to macroprudential and monetary policies

- The growth of institutional investors in RRE has been amplified by the tightening in lending standards in the aftermath of the GFC and by banking and macroprudential regulations (US, Gete and Reher, 2018; EA, Muñoz and Smets, 2022).
- This development can reduce the reliance of the housing market on bank funding, which is important in building broader and more integrated capital markets. At the same time, structural vulnerability in the fund sector, for example related to sudden outflows, can have adverse effects on local markets (Daly et al., 2023).
- The presence of institutional investors in the US is mainly related to a search for yield (Garriga et al., 2021). In addition, loose monetary policy has been shown to lead to booms in real estate lending and house prices' bubbles in the US, especially in supply inelastic markets (Jordà et al., 2015; Aastveit et al., 2023).
- In the euro area, unconventional monetary policy has been a key driver of house prices since 2013, especially in regions with lower labour income and more widespread homeownership (Battistini et al., 2022).

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Our transactions data set

- **RCA data set:** provides transaction-level data on (euro area) commercial real estate markets
- This includes purchases of residential assets by non-households – e.g. companies, financial entities, governments etc
- Includes location of building, price, buyers, sellers, date of sale
- **Important caveat:** Data set only provides a partial picture of all relevant transactions but it is the only data we have
 - Approach total values with caution – focus on dynamics over time
 - Doesn't include purchases by households – can't calculate % of total purchases which are from inst. investors
 - Appears biased towards larger transactions
 - Data quality likely varies across countries

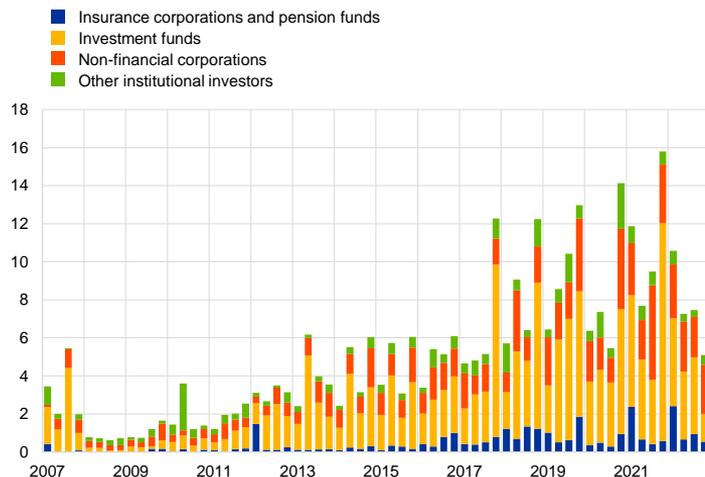
Key descriptive takeaways

- RCA data set provides transaction-level data on commercial real estate markets
- When RRE is bought by non-households it counts as CRE – think large housing complexes owned by companies/ financial entities

Investment funds play increasingly prominent role as buyers in EA RRE markets

Q1 2007 – Q4 2022

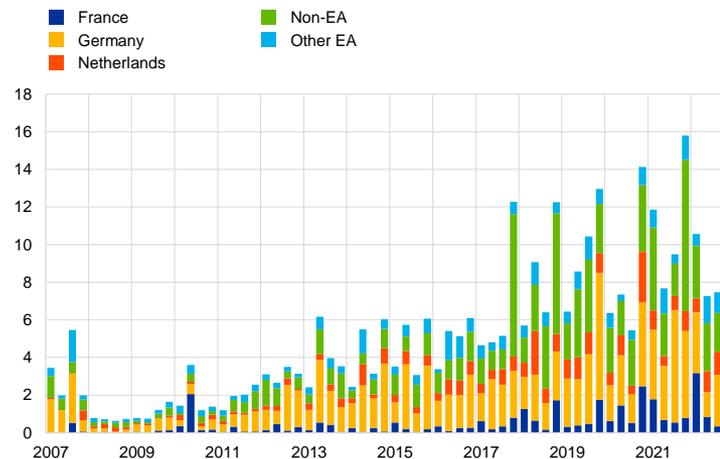
Quarterly transaction volume in bn EUR



Where are buyers from?

Q1 2007 – Q4 2022

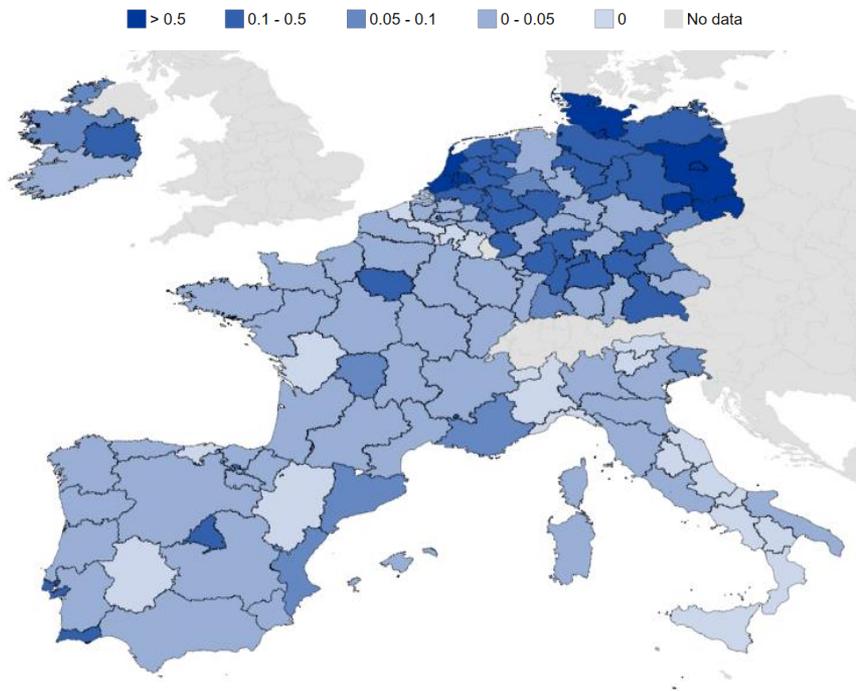
Quarterly transaction volume in bn EUR



Investor presence varies substantially across the euro area

Average investor participation rate by NUTS2 region

2007Q1-2021Q4, total transaction volume by institutional investors in RRE as a percentage of regional GDP, calculated by asset location



Source: RCA, Eurostat, ECB calculations

Notes: Investor participation rate defined as total transaction volume by institutional investors in RRE divided by regional GDP. The chart shows data only for those regions where both transactions data and regional price data (taken from EDW) are available.

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Empirical approach - Housing BVAR model*

- **Model:** Bayesian VAR, Euro Area aggregate, 2 lags (Normal-Wishart prior, optimized hyperparameters), sample 2007 Q1 – 2021 Q3, log-levels (except interest rates)
- **Endogenous Variables:**
 1. Real RRE prices
 2. Real lending for house purchase
 3. Lending rate on new loans for house purchase
 4. Shadow rate
 5. Real residential investment
 6. Real disposable income
- **Identification of structural shocks:**

	Housing Supply	Housing Preference	Income	Mortgage Supply	Monetary Policy
Residential Investments	-	+	*	0	0
RRE Prices	+	+	*	+	+
Mortgage loans	*	+	*	+	+
Lending rate	*	+	*	-	-
Shadow rate	0	0	0	0	-
Disposable income	0	0	+	0	0

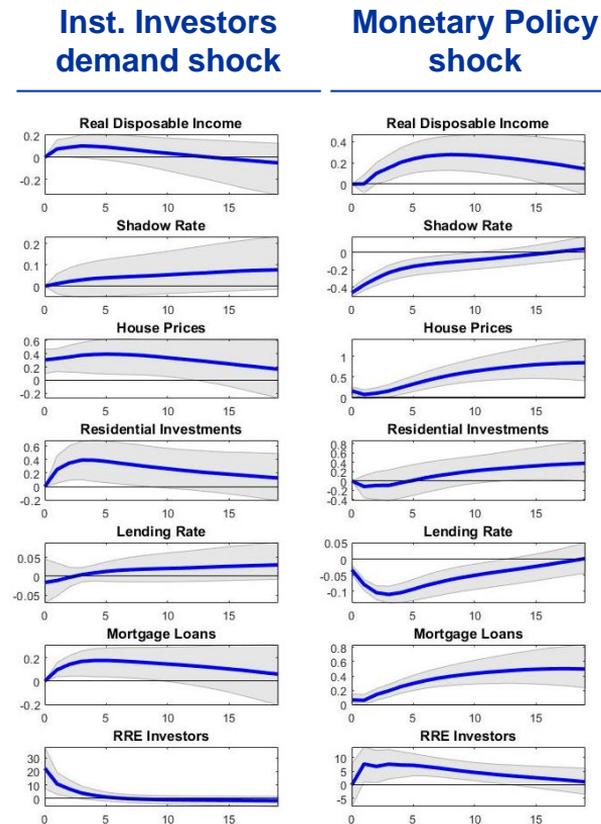
Identification of institutional investors shock for the real estate market

- Model **extended with a measure of institutional investors' demand** in the market
- Identification strategy**
 - Households and banks.** Housing supply vs housing demands distinguished via relation between investments and prices (opposite vs co-movement). Demand shock accompanied by a co-movement in mortgage lending volumes and rates (banks financing by households). Income shock linked to households' financial conditions.
 - Institutional investors.** Innovations that increase the financial attractiveness of RRE for i.i. relative to other asset classes that leads to change in demand. Consistent with HH demand (prices and supply comove). Distinguished from HH demand via volumes and prices of mortgages (financing of i.i. not through banks).

	Housing Supply	Housing Preference	Income	Mortgage Supply	Monetary Policy	Institutional Investors
Residential Investments	-	+	*	0	0	+
RRE Prices	+	+	*	+	+	+
Mortgage loans	*	+	*	+	+	0
Lending rate	*	+	*	-	-	0
Shadow rate	0	0	0	0	-	0
Disposable income	0	0	+	0	0	0
Institutional Investors' purchases	*	*	*	*	*	+

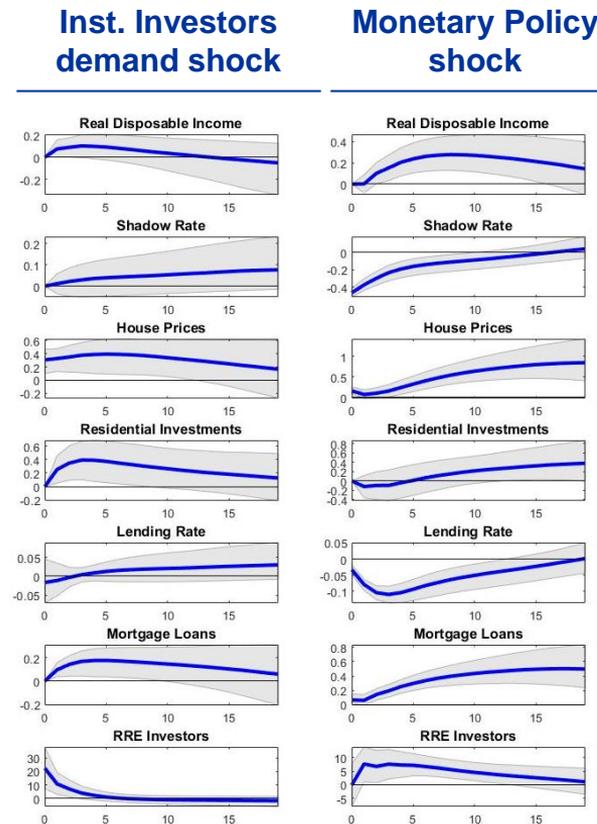
Identification of institutional investors shock for the real estate market

- **A demand shock from institutional investors** (i.e., 1 s.d. unexpected increase in investors' gross purchases) leads to:
 - **Positive and persistent impact on RRE prices** (0.4 percent) and,
 - A positive, yet delayed, impact on mortgage volumes (0.2 percent)
- ➔ The demand-pushed price increase (induced by i.i.) feeds through banks lending volumes via increased collateral values
- ➔ Potential banks/non-banks links via RRE market and potential feedback loop dynamics



Identification of institutional investors shock for the real estate market

- **An accommodative monetary policy shock** (i.e., 1s.d. unexpected increase in MP short term rate):
 - **Transmits to RRE** mainly through a **lower bank lending rate** and leads to a positive yet delayed response in house prices (standard literature).
 - **Positive impact on institutional investors' gross purchases** -> evidence for institutional investors' search for yields in times of easing monetary policy, when residential real estate assets might become more attractive relative to other asset classes (linear VAR → an expansionary MP shock is symmetric to a tightening MP shock).

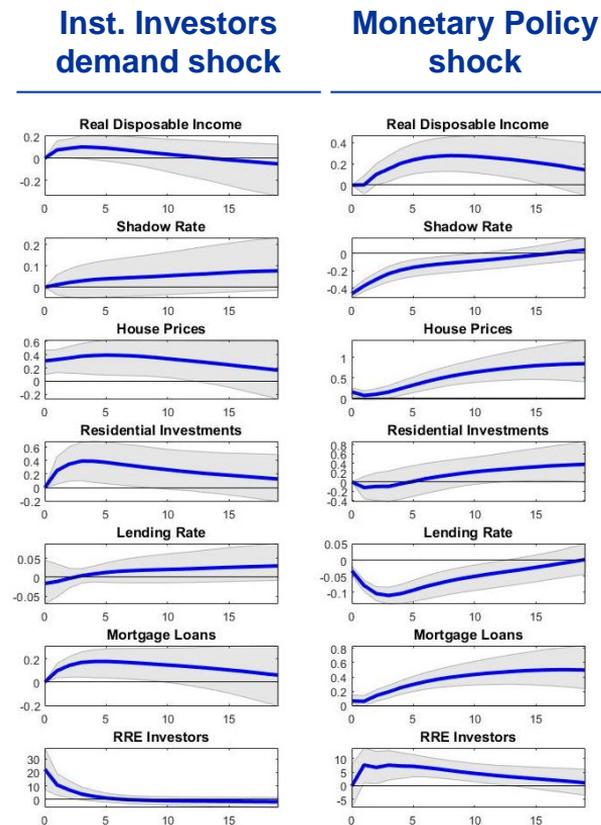


Conclusions drawn from Euro area analysis

Taken together, the above results suggest that:

- **The presence of institutional investors can result** in a faster increase in prices and potentially faster build-up of cyclical risk, which in turn can lead to a higher probability of disorderly price corrections in the burst phase.

➔ **The presence of institutional investors tends to amplify residential real estate cycles and the impact of monetary policy surprises.**



Overview

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Regional data

- **European Data Warehouse**
 - Panel dataset of securitised loans
 - We use it to compute regional **house price growth**
- **MSCI Real Capital Analytics**
 - Transaction-level data of large real estate deals
 - We use it to compute **institutional investor purchase and sale volumes**
- **Bloomberg**
 - Market indicators (e.g. VSTOXX)
- **Eurostat**
 - Demographic and macroeconomic regional data
- Shadow rate from **Wu and Xia (2020)** and **Krippner (2015)**

EUROPEAN
DATAWAREHOUSE

MSCI 

Bloomberg

eurostat 

Do markets with institutional investors behave differently?

Use dynamic panel data analysis to first confirm BVAR results and then to see if presence of institutional investors affects market dynamics

Total purchases by institutional investors, normalised by regional GDP, deviation from regional historical mean

$$\text{house price growth}_{i,t+4} = \alpha + \beta \text{Investor demand}_{i,t} + X_{i,t} + \delta_j + \varepsilon_{it}$$

$$\text{house price growth}_{i,t+4} = \alpha + \beta \text{Investor presence}_{i,t} * \text{macro}_{i,t} + X_{i,t} + \delta_j + \varepsilon_{it}$$

i = region

t = time

j = country (BE, DE, FR, PT, ES, NL, IE, IT)

δ_j : Country fixed effects – control for cross-country differences in regulation etc.

$X_{i,t}$: Time-region controls – current house price growth, GDP per capita, GDP growth, population growth.

Total purchases plus total sales by institutional investors over previous 3 years, normalised by regional GDP

Compensation of employees
EA shadow rate
US shadow rate
VSTOXX...

Confirming BVAR findings at regional level

$$\text{house price growth}_{i,t+4} = \alpha + \beta \text{Investor demand}_{i,t} + X_{i,t} + \delta_j + \varepsilon_{it}$$

VARIABLES	(1)	(2)	(3)	(4)
	No FE	Country FE	Region FE	Region and Year FE Shadow rate
GDP per capita	0.000273*** (7.48e-05)	6.51e-05 (5.33e-05)	0.000595** (0.000257)	-0.000337 (0.000247)
House price growth	0.204*** (0.0350)	0.0722** (0.0357)	0.0322 (0.0356)	-0.0292 (0.0365)
GDP growth	0.109** (0.0513)	0.0425 (0.0556)	0.0235 (0.0731)	0.190*** (0.0577)
Population growth	-0.0329 (0.226)	0.855*** (0.264)	0.894** (0.359)	0.839*** (0.306)
Investor demand	1.091*** (0.415)	1.366** (0.559)	0.934* (0.504)	0.905** (0.402)
EA shadow rate				-0.412*** (0.0881)
Constant	-1.401*** (0.508)	-0.358 (0.363)	-3.802** (1.854)	3.667** (1.760)
Observations	6,476	6,476	6,476	6,476
R-squared	0.066	0.156	0.022	0.134
Country FE	NO	YES	NO	NO
Region FE	NO	NO	YES	YES
Year FE	NO	NO	NO	YES
Number of NUTS2			132	132

Added as control variable

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Note: frequency is quarterly. Investor demand is winsorised, 5th percentile on the right tail of each NUTS2-level pooled distribution.

Do investors weaken the link between real economy and house prices?

$$\begin{aligned} \text{house price growth}_{i,t+1} &= \\ &= \alpha + \beta \text{Investor participation}_{i,t} * \text{wages}_{i,t} + \\ &+ X_{i,t} + \delta_j + \varepsilon_{it} \end{aligned}$$



VARIABLES	(1)	(2)
	Compensation of employees No FE	Compensation of employees Country FE
GDP per capita	5.72e-05*** (1.97e-05)	1.44e-05 (1.49e-05)
House price growth	-0.0620 (0.0498)	-0.194*** (0.0476)
GDP growth	-0.00193 (0.0113)	0.000480 (0.00864)
Population growth	0.00987 (0.224)	0.812*** (0.269)
Investors participation	11.06*** (3.728)	7.527** (3.740)
Compensation of employees growth	0.478*** (0.0664)	0.316*** (0.0755)
Investor partic. # Comp. empl. growth	-1.464** (0.606)	-1.081* (0.604)
Constant	-1.788*** (0.513)	-0.316 (0.492)
Observations	1,544	1,544
R-squared	0.073	0.158
Country FE	NO	YES

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Do investors weaken the link between real economy and house prices?

$$\text{house price growth}_{i,t+1} = \alpha + \beta \text{Investor participation}_{i,t} * \text{comp. of employees}_{i,t} + X_{i,t} + \delta_j + \varepsilon_{it}$$

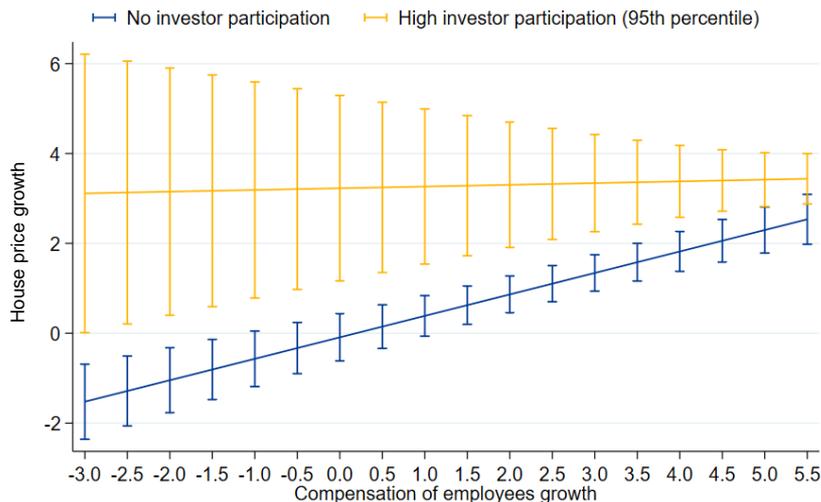
Blue line: In markets with no inst. investors there is a clear relationship between compensation of employees (x axis) and house price growth (y axis)

Yellow line: In markets with investors

- House price growth is typically higher
- There is no relationship with compensation of employees growth

Interpretation: Lack of link between compensation of employees and house price growth suggests investors reduce link between fundamentals and prices – possibly driving overvaluation and affordability issues

Estimated marginal effect of wage growth on one-year ahead house prices for different levels of investor participation
Sample period: 2007-2021



Notes: predicted one-year ahead house price growth based on a panel regression for NUTS 2 regions as shown in panel a for the years 2008 to 2020. Estimates include controls for regional GDP per capita and current house price growth, GDP and population growth and are robust to the inclusion of country fixed effects. "High investor participation" corresponds to the 95th percentile in the pooled distribution. Shaded areas indicate 95% confidence intervals. Results for model without fixed effects are shown.

Do investors change the link between monetary policy and house prices?

$$\begin{aligned} \text{house price growth}_{i,t+1} &= \\ &= \alpha + \beta \text{Investor participation}_{i,t} \\ &\quad * \text{shadow rate}_{i,t} + \\ &\quad + X_{i,t} + \delta_j + \varepsilon_{it} \end{aligned}$$

Average of shadow rates from Wu and Xia (2020) and Krippner (2015), calculated for EA and US

VARIABLES	(1)	(2)	(3)	(4)
	EA shadow rate Country FE	EA shadow rate Region FE	US shadow rate Country FE	US shadow rate Region FE
GDP per capita	-3.81e-05 (4.64e-05)	-0.000352* (0.000210)	-5.08e-05 (4.80e-05)	-0.000606*** (0.000228)
House price growth	0.0601* (0.0344)	0.0305 (0.0347)	0.0409 (0.0335)	0.0131 (0.0336)
GDP growth	0.00241 (0.0623)	0.0217 (0.0667)	-0.0321 (0.0687)	-0.0168 (0.0719)
Population growth	0.997*** (0.241)	1.191*** (0.340)	1.001*** (0.240)	1.242*** (0.330)
Investor partic. (non-EA)			4.618 (4.692)	5.389 (5.721)
US shadow rate			0.445*** (0.0932)	0.500*** (0.0969)
Investor partic. (non-EA) # US shadow rate			-2.401 (1.462)	-2.279* (1.361)
EA shadow rate	-0.373*** (0.0598)	-0.431*** (0.0740)	-0.328*** (0.0546)	-0.432*** (0.0771)
Investor partic. (EA)			-0.323 (0.714)	0.0124 (1.084)
Investor participation	-0.00637 (0.399)	0.294 (0.976)		
Investor partic. # EA shadow rate	-0.207 (0.140)	-0.346** (0.172)		
Constant	-0.0648 (0.337)	2.633* (1.511)	0.307 (0.336)	4.791*** (1.677)
Observations	6,476	6,476	6,476	6,476
R-squared	0.177	0.044	0.189	0.061
Country FE	YES	NO	YES	NO
Region FE	NO	YES	NO	YES
Number of NUTS2		132		132

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: frequency is quarterly.

Do investors change the link between monetary policy and house prices?

$$\begin{aligned}
 & \text{house price growth}_{i,t+1} = \\
 & = \alpha + \beta \text{Investor participation}_{i,t} \\
 & * \text{shadow rate}_{i,t} + \\
 & + X_{i,t} + \delta_j + \varepsilon_{it}
 \end{aligned}$$

Average of shadow rates from Wu and Xia (2020) and Krippner (2015), calculated for EA and US

VARIABLES	(1)	(2)	(3)	(4)
	EA shadow rate Country FE	EA shadow rate Region FE	US shadow rate Country FE	US shadow rate Region FE
GDP per capita	-3.81e-05 (4.64e-05)	-0.000352* (0.000210)	-5.08e-05 (4.80e-05)	-0.000606*** (0.000228)
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Observations	6,476	6,476	6,476	6,476
R-squared	0.177	0.044	0.189	0.061
Country FE	YES	NO	YES	NO
Region FE	NO	YES	NO	YES
Number of NUTS2		132		132

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: frequency is quarterly.

Do investors change the response of RRE markets to monetary policy?

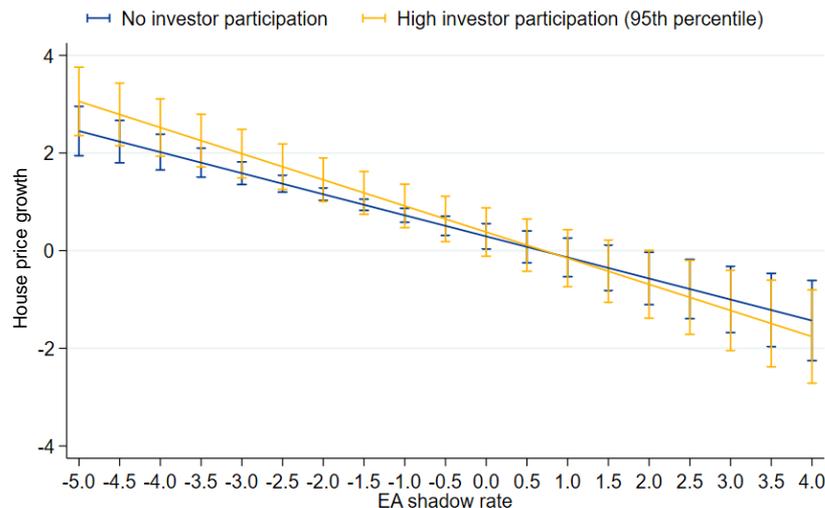
$$\text{house price growth}_{i,t+4} = \alpha + \beta \text{Investor presence}_{i,t} * \text{shadow rate}_t + X_{i,t} + \delta_j + \varepsilon_{it}$$

Difference in response to monetary policy for markets with **no institutional investors** and **high investor presence** is generally not statistically significant.

Interpretation: Our BVAR shows that institutional investors respond to monetary policy but ultimately this response may be similar in magnitude to that of households.

Cost of borrowing to households for house purchase and investors overall cost of financing (proxied by government bonds) are highly correlated.

Estimated marginal effect of EA shadow rate on one-year ahead house prices for different levels of investor participation
Sample period: 2007-2021



Notes: predicted one-year ahead house price growth based on a panel regression for NUTS 2 regions as shown in panel a for the years 2008 to 2020. Estimates include controls for regional GDP per capita, current house price growth, GDP and population growth. Shaded areas indicate 95% confidence intervals. Results for model with region fixed effects are shown.

Do investors create a link between housing markets and global shocks?

$$\begin{aligned}
 & \text{house price growth}_{i,t+1} = \\
 & = \alpha + \beta \text{Investor participation}_{i,t} \\
 & * \text{shadow rate}_{i,t} + \\
 & + X_{i,t} + \delta_j + \varepsilon_{it}
 \end{aligned}$$

Some evidence that international investors create intuitive link between US monetary policy and EA house prices

VARIABLES	(1)	(2)	(3)	(4)
	EA shadow rate Country FE	EA shadow rate Region FE	US shadow rate Country FE	US shadow rate Region FE
GDP per capita	-3.81e-05 (4.64e-05)	-0.000352* (0.000210)	-5.08e-05 (4.80e-05)	-0.000606*** (0.000228)
House price growth	0.0601* (0.0344)	0.0305 (0.0347)	0.0409 (0.0335)	0.0131 (0.0336)
GDP growth	0.00241 (0.0623)	0.0217 (0.0667)	-0.0321 (0.0687)	-0.0168 (0.0719)
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Investor partic. (EA)			-0.323 (0.714)	0.0124 (1.084)
Investor participation	-0.00637 (0.399)	0.294 (0.976)		
Investor partic. # EA shadow rate	-0.207 (0.140)	-0.346** (0.172)		
Constant	-0.0648 (0.337)	2.633* (1.511)	0.307 (0.336)	4.791*** (1.677)
Observations	6,476	6,476	6,476	6,476
R-squared	0.177	0.044	0.189	0.061
Country FE	YES	NO	YES	NO
Region FE	NO	YES	NO	YES
Number of NUTS2		132		132

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: frequency is quarterly.

Do institutional investors increase exposure of RRE markets to financial market shocks?

$$\text{house price growth}_{i,t+4} = \alpha + \beta \text{Investor presence}_{i,t} * \text{VSTOXX}_t + X_{i,t} + \delta_j + \varepsilon_{it}$$

Max/average per quarter

VARIABLES	(1)	(2)	(3)	(4)
	Max VSTOXX 4q horizon	Mean VSTOXX 4q horizon	Max VSTOXX 12q horizon	Mean VSTOXX 12q horizon
GDP per capita	6.99e-05 (5.34e-05)	7.22e-05 (5.35e-05)	0.000122** (5.28e-05)	0.000116** (5.23e-05)
House price growth	0.0705** (0.0356)	0.0701* (0.0356)	-0.133*** (0.0320)	-0.127*** (0.0320)
GDP growth	0.0516 (0.0541)	0.0540 (0.0539)	0.148** (0.0603)	0.133** (0.0570)
Population growth	0.767*** (0.276)	0.755*** (0.276)	-0.357 (0.252)	-0.333 (0.248)
Investor participation	3.584*** (1.055)	4.131*** (1.265)	4.164* (2.321)	4.651* (2.401)
Max VSTOXX	0.0250** (0.0104)		-0.110*** (0.0157)	
Investor partic. # Max VSTOXX	-0.0939*** (0.0324)		-0.0938 (0.0847)	
Mean VSTOXX		0.0338*** (0.0124)		-0.144*** (0.0193)
Investor partic. # Mean VSTOXX		-0.130*** (0.0439)		-0.131 (0.0992)
Constant	-1.041** (0.468)	-1.196** (0.479)	2.372*** (0.524)	2.971*** (0.549)
Observations	6,476	6,476	5,411	5,411
R-squared	0.157	0.158	0.190	0.196
Country FE	YES	YES	YES	YES

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: frequency is quarterly.

Do institutional investors increase exposure of RRE markets to financial market shocks?

$$\text{house price growth}_{i,t+4} = \alpha + \beta \text{Investor presence}_{i,t} * \text{VSTOXX}_t + X_{i,t} + \delta_j + \varepsilon_{it}$$

- Financial market shocks are ultimately associated with lower house price growth across all markets

- Participation of institutional investors speeds up this transmission and creates downward pressure on house prices in the quarters immediately following the shock.

VARIABLES	(1)	(2)	(3)	(4)
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Recap: Research question and key findings

We examine the growing role of institutional investors in euro area residential real estate (RRE) markets to understand if and how these players affect market dynamics

- A. Transactions-level data set:** shows a steady increase in institutional investor purchases of euro area residential real estate assets since 2010
- B. BVAR framework:** 1) increasing (decreasing) institutional investor demand associated with rising (falling) house prices and rising (falling) mortgage growth. 2) Contractionary (expansionary) monetary policy shocks associated with a drop in investor demand.
- C. Regional dynamic panel data analysis:** 1) regions with a higher institutional investor presence have a weaker link between house price growth and local wage growth; 2) monetary policy transmission via house prices appears to be unaffected by the presence of these investors; 3) institutional investors appear to create a link between global/ financial market shocks and house prices

Overview

1. Motivation and literature
2. Data set and descriptive statistics
3. Can institutional investors influence aggregate market dynamics?
BVAR analysis
4. Do institutional investors change the way RRE markets behave?
Regional dynamic panel data analysis
5. **What does this mean for financial stability and macroprudential policy?**

Financial stability and policy considerations

- Institutional investors can amplify residential real estate cycles, due to their sensitivity to large-scale investors redemptions, which may lead to reduced demand or forced asset sales.
- This can result in faster build-up of cyclical risks or higher probability of disorderly price corrections in the burst phase, with potentially negative implications for the financial resilience of banks, households and exposed firms.
- These findings add to the importance for developing policies to reduce vulnerabilities in the fund sector. These would include the more active use of liquidity measurement tools and aim at reducing liquidity mismatch, to reduce funds' sensitivity to large-scale redemptions.

Thank you!