Determinants of house prices in central and eastern Europe

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Financial Cycles and the Real Economy: Lessons for CESEE
Session 1: Real Estate Bubbles and the Financial Crisis

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Outline

1. Approaches in the literature
2. Understanding a house price “bubble”
3. Evidence on the boom-bust cycle
4. Determinants of house prices
5. Policy implications

Appendix

1. Approaches in the literature

How do (empirical) economists think about house prices?

- housing is similar to other assets, we can study housing markets with the aid of asset pricing theories
- there is an “equilibrium” long-term price of housing, it can be uncovered by properly specifying and estimating empirical models of the determinants of house prices
- determinants include demand-side, supply-side and institutional variables

Mainstream approach

Demand-side determinants (“fundamentals”)

- real disposable income
- real interest rates – measure both financing and opportunity costs
- labour market trends (employment growth, unemployment rate)
- demographic factors (population growth, migration trends, size of households)
- credit availability – housing finance products, lending practices

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Supply-side factors

- land for development – availability and price
- construction costs – construction wages, material costs

Institutional factors

- how developed is the housing finance market
  - types of housing loans
  - secondary mortgage market
  - collateral and bankruptcy legislation
- tax system (mortgage interest deductibility, imputed rents, property and wealth taxes)

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Challenge: how to combine information on housing market conditions to assess whether current house prices are "right", ie not "out of line" with fundamentals

- Estimate long-run "equilibrium" relationship linking house prices with demand, supply and institutional determinants:

$$P_{it}^{*} = f(X_{it})$$

- Model fluctuations of actual house prices around long-run eq'm

$$\Delta P_{it} = \alpha\,\Delta P_{i,t-1} + \beta(P^{*}_{i,t-1} - P_{i,t-1}) + \gamma\Delta P^{*}_{it}$$

- This is an *error-correction* equation describing short-run price dynamics

α = serial correlation term (house prices are persistent), $\alpha > 0$
β = mean reversion term (rate of adjustment to long-run eq'm), $0 < \beta < 1$
γ = contemporaneous adjustment term (how current prices adjust to changes in long-run eq'm prices), $0 < \gamma < 1$

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- Examine deviations of actual from equilibrium prices $P^*_{i,t} - P_{i,t}$

  (i) component driven by short-run dynamics

  $$P^*_{i,t} - [P_{i,t-1} + E_{t-1}(\Delta P_{i,t})]$$

  (ii) residual component that cannot be explained by short-run dynamics

  $$P^*_{i,t} - P_{i,t} - \left(P^*_{i,t} - [P_{i,t-1} + E_{t-1}(\Delta P_{i,t})] \right) = E_{t-1}(\Delta P_{i,t}) - (P_{i,t} - P_{i,t-1})$$

  Intuition: (i) some deviations of actual from equilibrium prices can be attributed to housing market frictions present in the short term, such as supply bottlenecks, capital inflows, migration shifts, etc.;

  (ii) some deviations result from other forces, eg too optimistic or pessimistic expectations

- Short-run frictions get smoothed over time, allowing prices to return to their long-term equilibrium ...
- ... and they can be addressed by different policies
- But some short-run deviations of actual from equilibrium prices cannot be traced back to identifiable demand/supply frictions or changes in housing market institutions
- They may cause large price surges or busts that are unrelated to fundamentals and are difficult to address with conventional policies → house price "bubbles"
- The expectations term $E_{t-1}(\Delta P_{i,t}) - (P_{i,t} - P_{i,t-1})$ is an example of how price bubbles can be approximated in empirical work (see eg A Ciarlone, Banca d'Italia WP 863, 2012)

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2. Understanding a house price "bubble"

Intuitive definition: state of market in which prices are no longer anchored by fundamentals; prices are expected to rise rapidly on a sustained basis

Buyers' reasoning:

- we have to buy now, won't be able to afford a home later
- can buy a more expensive home now than we might afford otherwise: house prices will rise, we'll make capital gains!
- don't have to save as much as otherwise, the increased value of the home is doing the saving for us!
- can borrow more – collateral value is rising

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- Sellers' / builders' reasoning:
  - we can ask buyers to pay a higher price than we would normally sell for
  - can build more expensive homes than we'd normally consider building – prices will rise!
  - can borrow more to build new homes than otherwise: sales are rising, profit margins are high

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- Investors' / speculators' reasoning:
  - we can buy homes cheap and sell them at a higher price
  - can borrow more to finance such investments: value of collateral is rising!
  - know the market well enough to sell homes before prices start to fall
- Banks' reasoning:
  - we can increase mortgage lending volumes, interest and fee revenue
  - credit risk is low when prices are rising

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- Government officials' reasoning:
  - construction and home supply industries are doing well (high output multiplier!)
  - employment is rising
  - banks have brisk business
  - we're getting a lot of tax revenue!
  - some households are complaining about high house prices, but we can put in place some special house lending scheme, eg for young couples

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Summing up: during a bubble, all market participants expect house prices to keep on rising, disregarding more or less developments in fundamentals

→ the notion of a bubble is defined in terms of expectations, people's theories about the future path of prices

→ some sort of collective delusion might be at work during a bubble, it affects the judgment of buyers and sellers, lenders and borrowers, builders and developers

→ for a while, the bubble can be a self-fulfilling prophecy: house prices keep on rising, all the buying, building and borrowing looks justifiable and profitable

→ media play an important role in shaping house price expectations

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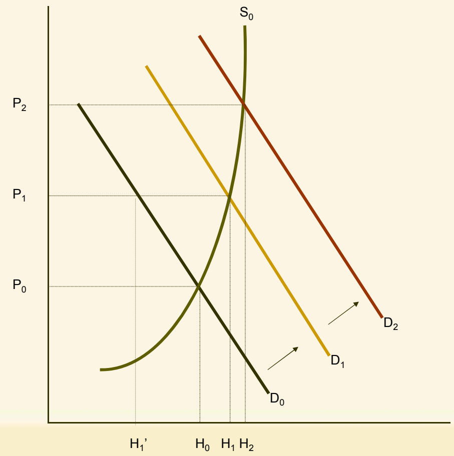
Let house prices rise from P_0 to P_1
Normal market response: quantity demanded falls from H_0 to H_1'
But during a bubble, demand curve shifts outward, quantity demanded increases from H_0 to H_1
And if prices rise further to P_2, demand increases to H_2



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Summing up (cont'd)

→ but house prices are inherently unstable during a bubble: they cannot go up forever; once unsustainable levels in relation to incomes and other "fundamentals" are reached, the acceptance of high prices stops and prices collapse

→ the bubble bursts

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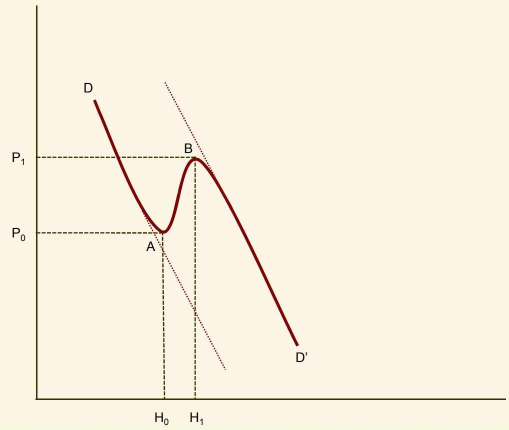
During a bubble, the demand curve seems to be twisted:
it bends backward between A and B
When the bubble bursts, the demand curve bends downward again



3. Evidence on the boom-bust cycle

11 CEE countries + Ireland, Spain, Austria, Germany, Switzerland

Period covered: 2000 – 2013:Q2

Peak and trough timings differ across countries

House prices in some countries have yet to reach trough/peak

Four groups of countries:

1. Super boom (>20% pa from 2000 to peak): Latvia, Estonia, Lithuania, Bulgaria
2. Boom (10–20% pa): Poland, Slovakia, Slovenia, Czech Republic, Spain, Ireland [Romania]
3. Strong increase (5–10% pa): Croatia, Hungary, Austria (esp. since 2007:Q4)
4. Moderate increase (2–5% pa): Switzerland, Germany

Changes in house prices (in percent)

	LV	LT	EE	BG	CZ	SK	PL	ES	SI	HR	AT	IE	HU	CH	DE	RO
Cumulative changes																
2000[1] – peak[2]	605	522	457	349	173	155	139	135	117	100	98	94	89	72	25	...
Peak – latest[3, 4]	–30	–42	–26	–39	–20	–18	–19	–29	–19	–29	...	–53	–22	...	...	–36

	LV	EE	LT	BG	PL	SK	SI	CZ	ES	IE	HR	HU	RO	AT	CH	DE
Average annual growth rates																
2000[1] – peak[2]	33.6	30.2	28.7	21.4	17.2	16.9	15.1	13.8	12.5	11.2	10.0	9.2	...	5.6[5]	4.4	1.9
Peak – latest[3]	–4.7	–3.9	–6.9	–6.8	–3.6	–3.4	–3.8	–5.7	–5.0	–6.8	–5.0	–4.1	–7.5	...	...	...

AT = Austria; BG = Bulgaria; HR = Croatia; CZ = Czech Republic; EE = Estonia; DE = Germany; HU = Hungary; IE = Ireland; LV = Latvia; LT = Lithuania; PL = Poland; RO = Romania; SK = Slovakia; SI = Slovenia; ES = Spain; CH = Switzerland.

[1] End-2000 or earliest available observation (for Slovakia, 2002; Slovenia, 2003; Poland, 2004; Romania 2009). [2] For Austria, Germany and Switzerland, changes in house prices from end-2000 to the latest observation. [3] The latest observation is 2013 Q2; for Bulgaria, Ireland and Switzerland, 2013 Q3. [4] For Latvia and Estonia, house prices dropped by 57 and 53 per cent, respectively, from the peak level to post-crisis trough. Thereafter, house prices rebounded from the post-crisis trough level by 62 and 57 per cent, respectively. [5] For Austria (Vienna), the average annual increase in house prices since 2007 Q4 has been 10.2%.

Source: national data.

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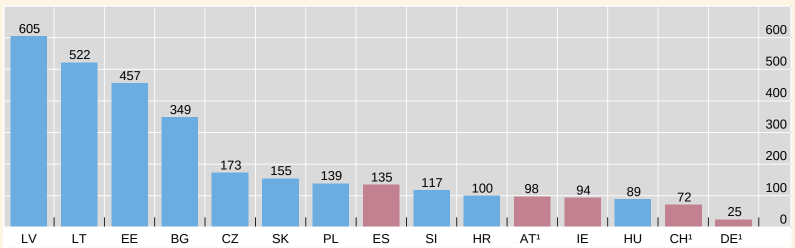
Cumulative changes in house prices from end-2000 to the peak[1]



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[1] For Austria, Germany and Switzerland, changes in house prices from end-2000 to the latest observation.

Source: national data.

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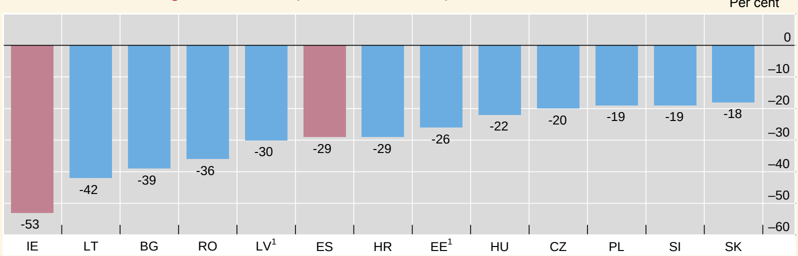
Cumulative changes in house prices from the peak to the latest observation[1]



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Source: national data.

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The boom is relatively easy to identify ex post, but not in real time

- Many demand-side covariates – “usual suspects” such as GDP, wages, interest rates, housing credit – peak either before or after the house prices
- Focusing on the supply side can help if detailed data breakdowns for the construction sector are available
- Difficulty of judging whether a boom is present illustrated currently in Austria, Germany and Switzerland

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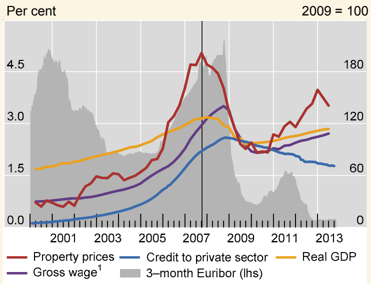
Note: Vertical line centred at the peak of the house price boom

Latvia – residential property prices in urban areas, existing and new flats

Demand side of the housing market



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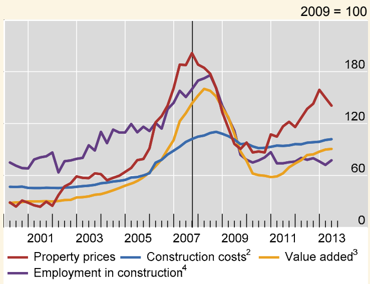

[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic prices; in national currency. [4] Total employment in construction industry; domestic concept.

Sources: Eurostat; Datastream; national data.

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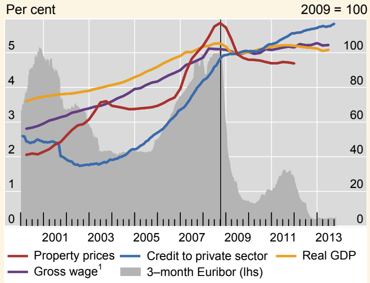
Czech Republic – residential property prices in whole country, existing flats

Demand side of the housing market



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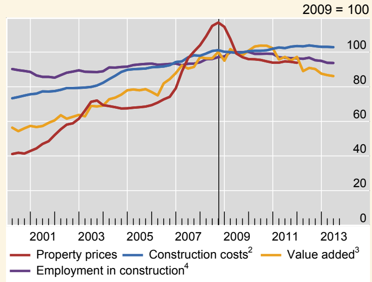

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Sources: Eurostat; Datastream; national data.

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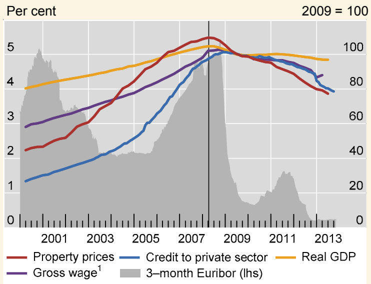
Spain – residential property prices in whole country, existing and new dwellings

Demand side of the housing market



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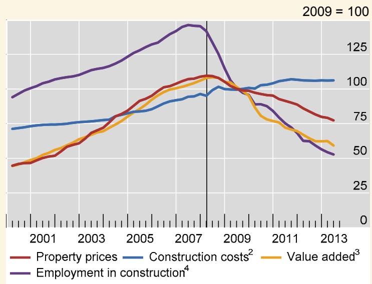

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Sources: Eurostat; Datastream; national data.

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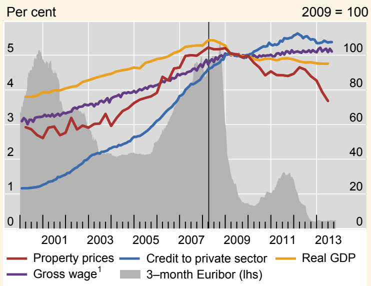
Croatia – residential property prices in whole country, existing and new dwellings

Demand side of the housing market



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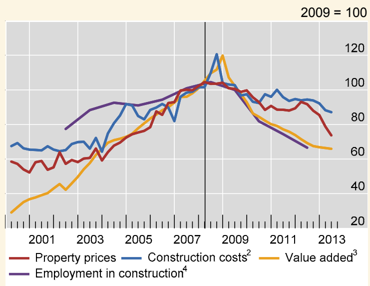

[1] Average monthly gross wage; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic prices; in national currency. [4] Total employment in construction industry; domestic concept.

Sources: Eurostat; Datastream; national data.

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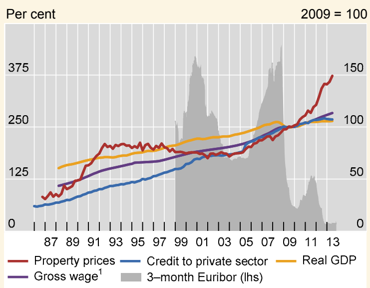
Austria – residential property prices in Vienna, new and existing flats

Demand side of the housing market



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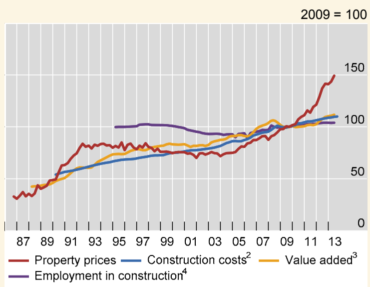

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Sources: Eurostat; Datastream; national data.

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4. Determinants of house prices

Main cross-country econometric studies:

Huynh-Olesen, Steiner, Hildebrandt and Wagner, OeNB, *Focus on European Economic Integration*, Q2/2013

A Ciarlone, Banca d'Italia, *Temi di discussione*, no 863, April 2012

Egert and Mihaljek, *Comparative Economic Studies*, March 2007

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Median elasticity estimates for CEE samples

	Ciarlone	OeNB (2013)	Egert-Mihaljek
Real income/wage	1.06	1.40	1.00
Real interest rate	–0.02	–0.02	–0.02
Housing loans/GDP	0.31	0.18	0.24
Unemployment rate	–0.24	...	–0.19
Demographic factors	...	>0, signif.	>0, signif.
Construction costs	0.35	0.71	>0, sig.
Building permits	0.27	0.29	...
Instit'l/transition factors	>0, signif.	>0, signif.	>0, signif.

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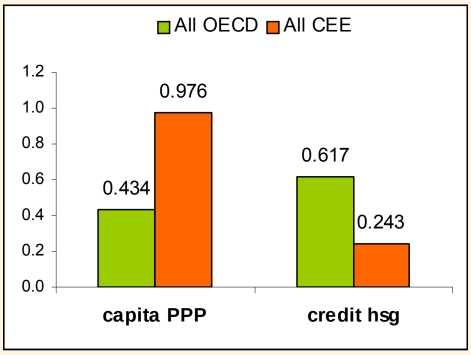
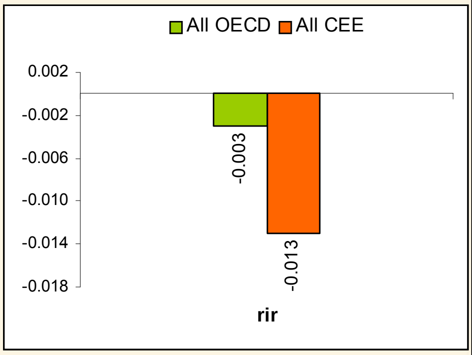
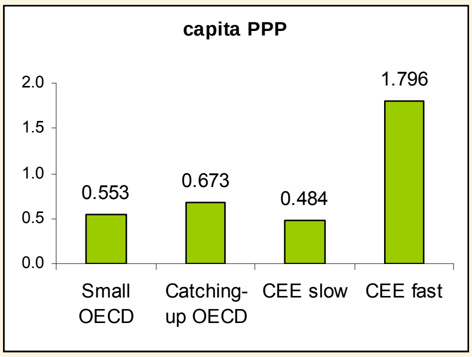
Responsiveness of house prices to fundamentals OECD vs. CEE economies

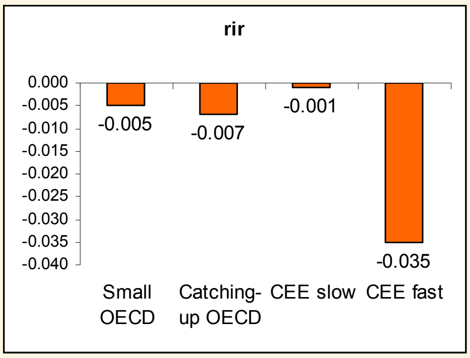




Source: Egert and Mihaljek (2007)

Greater income and real interest rate elasticities in fast-growing CEE countries





Source: Egert and Mihaljek (2007)

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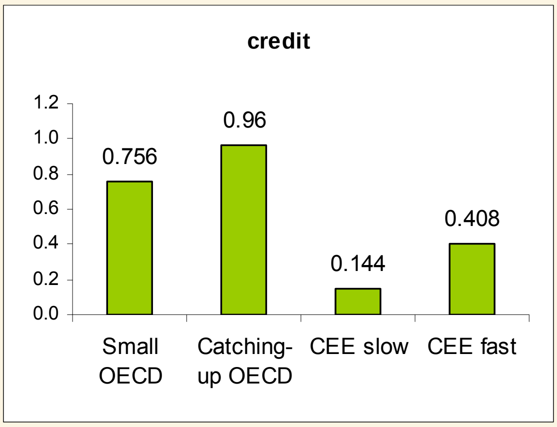
But smaller elasticities with respect to credit growth than in advanced economies



Source: Egert and Mihaljek (2007)

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Special features of housing markets in CEE

Factors which may explain faster growth of house prices in CEE compared to mature market economies

1. Poor quality of initial housing stock inherited from socialism
2. Low supply of new housing during the 1990s
3. Weak housing market institutions
4. Transformation of housing finance
5. External demand for housing
6. Initial undershooting of house prices

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Other notable results

- OeNB (2013) find significant effects on house prices of:
  - remittances (as a proxy for external demand)
  - domestic and foreign currency loans to households
  - funding provided by parent banks to CEE subsidiaries
- Ciarlone (2012) finds that house prices are:
  - highly persistent (median $\alpha \approx 0.35$)
  - adjust slowly to long-run eq'm (median $\beta \approx 0.33$)
  - sensitive to changes in eq'm house prices ($\gamma \approx 45$)

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Other notable results (cont'd)

- On the extent of over/undervaluation Ciarlone (2012) finds:
  - for most countries, over/under valuation of house prices is relatively small ($\pm$ 6%)
  - larger deviations in Latvia (+40%/ −20%), Bulgaria (+10%/ −25%), Lithuania and Poland ($\pm$10−12%)
  - deviations of actual from eq'm prices largely accounted for by housing market frictions rather than "bubbles"
  - but overly optimistic expectations seem to have affected house prices in Estonia, Lithuania Slovakia and Slovenia
  - … and overly pessimistic in Bulgaria and Latvia

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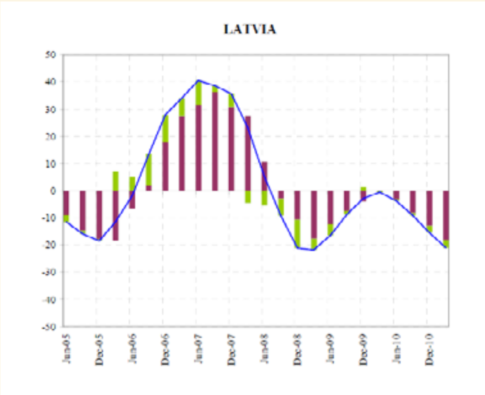
Blue lines: deviations of actual house prices from their long-run equilibrium (moving ave.)

Purple bars: short-run dynamics driven by housing market frictions

Green bars: residual component driven by overly optimistic/pessimistic expectations



Source: Ciarlone (2012), p. 40.

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5. Policy implications

What policy actions could be taken if we are worried a house price boom is about to develop?

Housing market regulations

Limited housing supply is often a key issue

- Spatial plans and zoning regulations
- Property titles
- Regulations in construction sector
- Labour market regulations

→ Origins of house price booms are often microeconomic

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Fiscal policy

- Ideally, tighten fiscal policy in good times
- Strong fiscal position helps in dealing with asset price declines – Estonia, Bulgaria as good examples
- Reduce/eliminate explicit or hidden subsidies for mortgage borrowing and/or home ownership – not sure this is a major issue in CEE

Monetary policy

- Key questions
  - Is monetary policy too easy?
    → adjust interest rates
  - How far is the house price boom credit-driven?
  - How are banks funding housing loans? (deposits, internally from parent banks, international market)?
    → use liquidity measures: reserve requirements, liquidity regulation (domestic, FX, marginal)
- Key constraints
  - exchange rate regime
  - free capital movement
  - foreign bank ownership
  - housing market institutions

Macroprudential policies

- capital measures
- risk weights measures
- provisioning measures
- borrower eligibility criteria
- credit controls

Analysis of the effectiveness of macroprudential policies in CEE:
IMF Working Paper no 12/303, December 2012

What could be done about house price expectations?

- media play an important role in shaping house price expectations
- central bank communication about macroeconomic and financial stability aspects of housing market developments can shape expectations, too
- financial education and consumer protection also have a role to play

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Appendix

Additional data on housing markets in CEE and selected European countries

(ordered by the size of house price increase from end-2000 to the peak or the latest observation)

Lithuania
Estonia
Bulgaria
Slovakia
Poland
Slovenia
Hungary
Romania
Ireland
Switzerland
Germany

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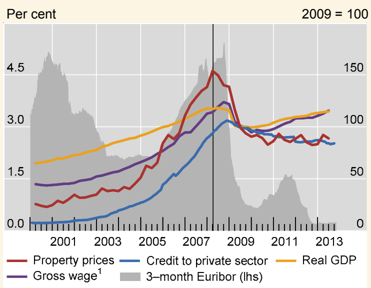
Note: Vertical line centred at the peak of the house price boom

Lithuania – residential property prices in whole country, existing and new dwellings

Demand side of the housing market



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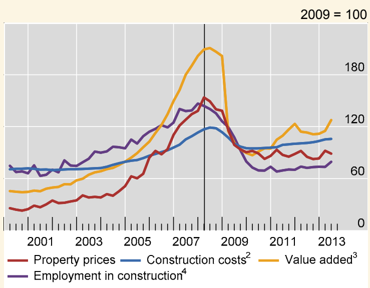

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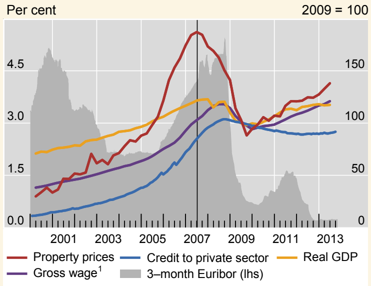
Sources: Lithuanian State Enterprise Centre of Registers; Eurostat; Datastream; national data.

Estonia – residential property prices in Tallinn, existing and new flats

Demand side of the housing market



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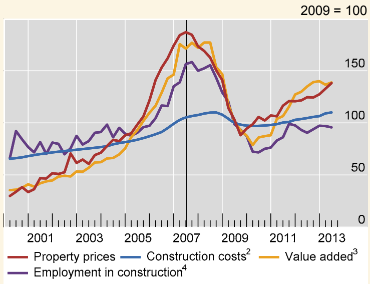

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Sources: Eurostat; Datastream; national data.

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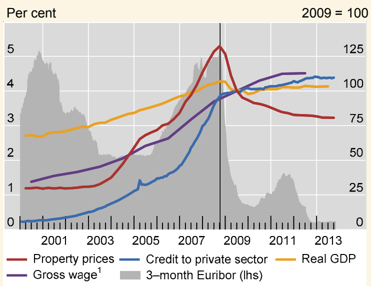
Bulgaria – residential property prices in big cities, existing flats

Demand side of the housing market



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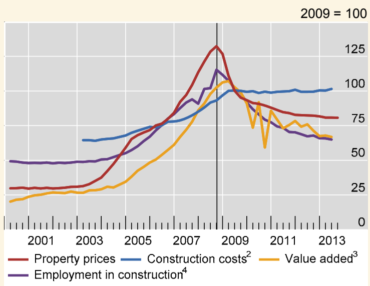

[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic prices; in national currency. [4] Total employment in construction industry; domestic concept.

Sources: Eurostat; Datastream; national data.

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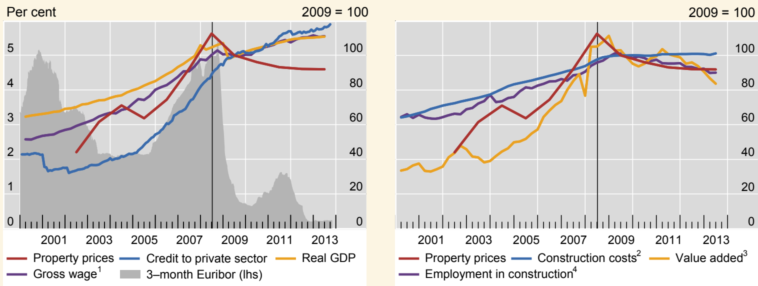
BANK FOR INTERNATIONAL SETTLEMENTS

Slovakia – residential property prices in whole country, existing and new dwellings

Demand side of the housing market / Supply side



[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic prices; in national currency. [4] Total employment in construction industry; domestic concept.

Sources: Eurostat; Datastream; national data.

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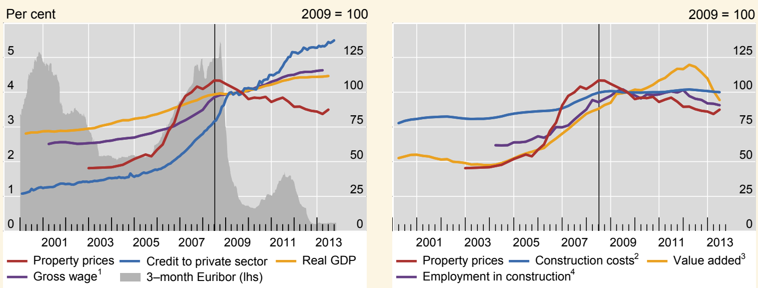
BANK FOR INTERNATIONAL SETTLEMENTS

Poland – residential property prices in Warsaw, new flats

Demand side of the housing market / Supply side



[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic prices; in national currency. [4] Total employment in construction industry; domestic concept.

Sources: Eurostat; Datastream; national data.

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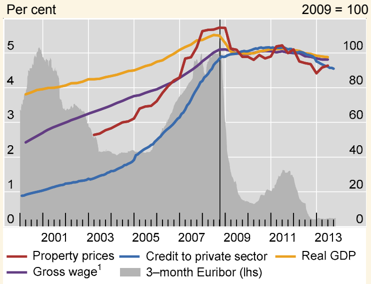
Slovenia – residential property prices in whole country, new dwellings

Demand side of the housing market



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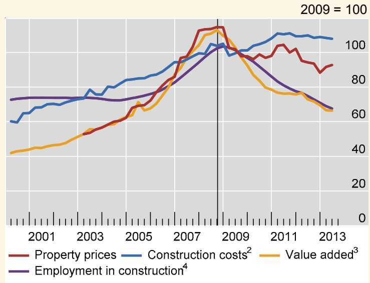

[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic prices; in national currency. [4] Total employment in construction industry; domestic concept.

Sources: Eurostat; Datastream; national data.

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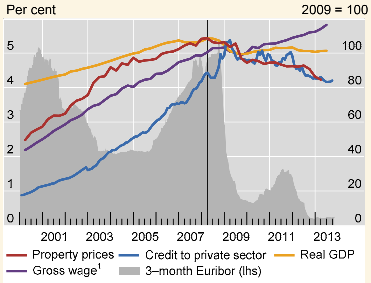
Hungary – residential property prices in whole country

Demand side of the housing market



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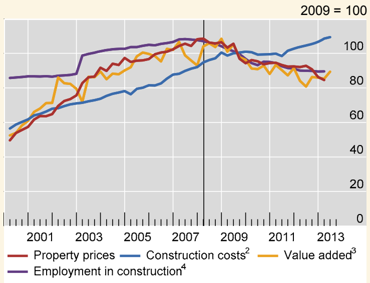

[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic prices; in national currency. [4] Total employment in construction industry; domestic concept.

Sources: FHB Banking Group; Eurostat; Datastream; national data.

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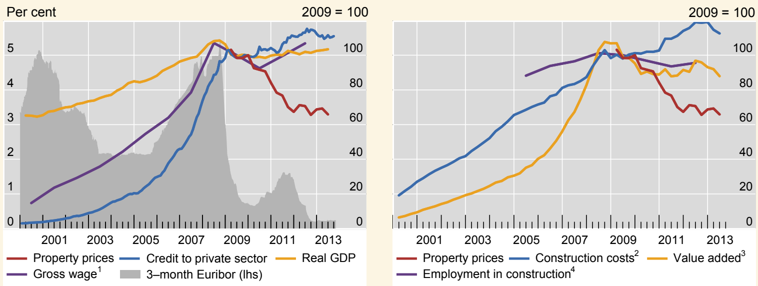
Romania – residential property prices in Bucharest, existing and new flats

Demand side of the housing market / Supply side



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Sources: Eurostat; Datastream; national data.

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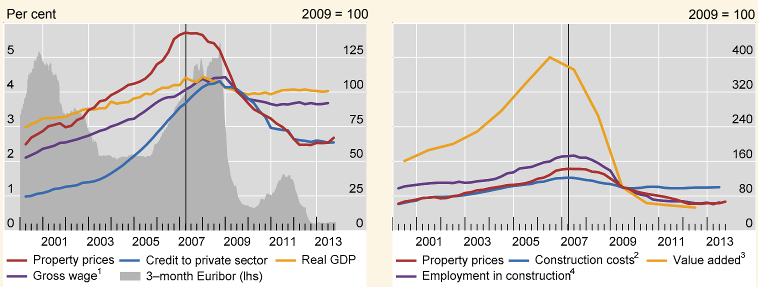
BANK FOR INTERNATIONAL SETTLEMENTS

Ireland – residential property prices in Dublin, existing and new dwellings

Demand side of the housing market / Supply side



[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic prices; in national currency. [4] Total employment in construction industry; domestic concept.

Sources: Eurostat; Datastream; national data.

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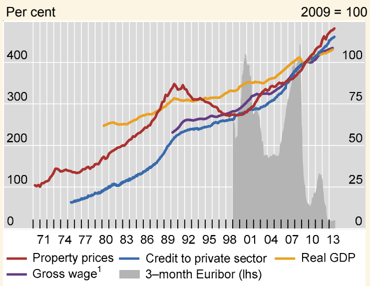
BANK FOR INTERNATIONAL SETTLEMENTS

Switzerland – residential property prices in whole country, new and existing flats

Demand side of the housing market



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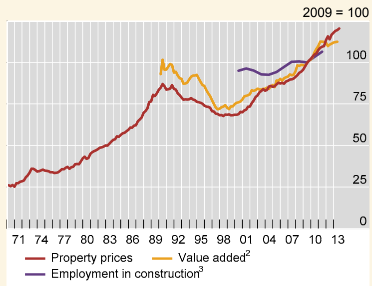


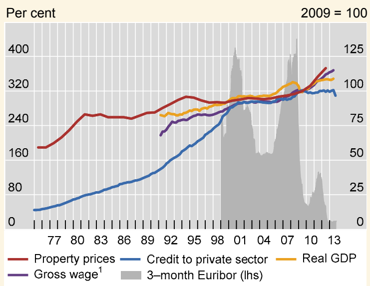
[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Gross value added of the construction industry; at current basic prices; in national currency. [3] Total employment in construction industry; domestic concept.

Sources: Eurostat; Datastream; national data.

BANK FOR INTERNATIONAL SETTLEMENTS

Germany – residential property prices in West Germany, new flats

Demand side of the housing market



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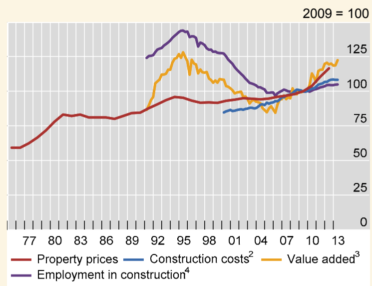

[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic prices; in national currency. [4] Total employment in construction industry; domestic concept.

Sources: Eurostat; Datastream; national data.