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Dubravko Mihaljek, Gregory Sutton, Michela Scatigna and Agne Subelyte

Determinants of House Prices: Evidence from a New International Database

Hotel "Grand Villa Argentina"

Dubrovnik

June 7 – 9, 2015

Draft version

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Determinants of house prices: evidence from a new international database

D Mihaljek, G Sutton, M Scatigna and A Subelyte
Bank for International Settlements

21st Dubrovnik Economic Conference
Session II, *House Prices and Macroprudential Policies*

Dubrovnik, 8 June 2015

The views expressed are those of the authors and not necessarily those of the BIS.

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Outline

1. Stylised facts on house prices from the new BIS dataset
2. Modelling house price dynamics – three approaches
3. What we do in this paper: asset pricing approach
4. Preliminary results

Appendix with data and graphs for selected European countries

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Preview of main results

- We use the new BIS database on residential property prices
- Two samples: full (≈1,000 obs, 52 countries, incl. shorter series) and restricted (≈ 840 obs, 28 countries, longer time series)
- Very simple baseline model

$$dlog\ rHP_t = c + \Sigma dlog\ rHP_{t-j} + \Sigma dlog\ rGDP_{t-j} + \Sigma dlog\ DomCR_{t-j} + \Sigma dIR_{t-j} + \Sigma dlog\ Empl_{t-j} + GF_t + \varepsilon_t$$

Real house prices = f (lagged house prices, real GDP, domestic credit growth, nominal interest rates, employment, global factor)

- Panel least squares estimation
- Interest rates explain a very small proportion of total variation in house prices

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BIS database on house prices

- 55 countries covered, of which 18 G20 countries
- 300 series in the database
- 18 countries with long series, with a starting date of 1970

Countries covered (blue + purple)
Long series as well (purple)

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Datasets published at: http://www.bis.org/statistics/pp.htm

	Advantages	Drawbacks
Detailed data set	• Several series for each country (breakdown or different sources) • Updated monthly	• Heterogeneous series • High number of series may hamper usage
Selected series	• Most homogenous* • Best for international comparison • Also expressed in real terms • Analysed in BIS *Quarterly Review*, Sept 2014	
Long series	• Start date: 1970: suitable for financial stability analysis	• Only 18 countries • Heterogeneity of series, compilation methods • Quarterly data are partly estimated

*Remaining heterogeneities: source of data, quality adjustment method

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The roles of BIS and central banks

BIS:

- Global hub for house price data
- Collect good quality data in cooperation with central banks
- Disseminate data with detailed metadata
- Answer questions raised by users
- Contact e-mail address: property.prices@bis.org

Central Banks:

- Identify possible further private and public compilers of house price data

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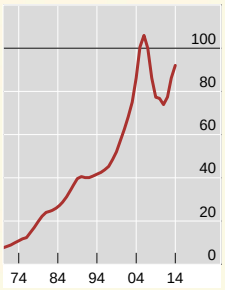
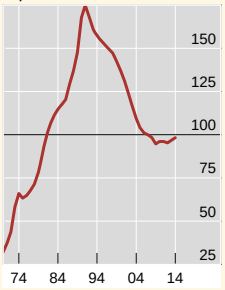
Stylised facts on house prices in selected countries

House prices, annual averages, 2007 = 100

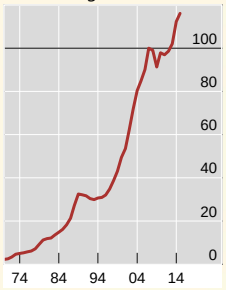
United States



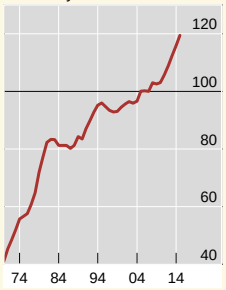
Japan



United Kingdom



Germany



Source: National data.

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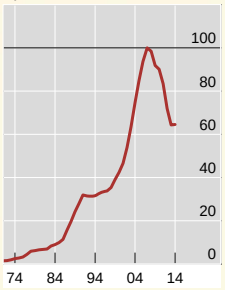
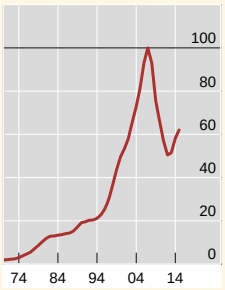
Stylised facts on house prices in selected countries

House prices, annual averages, 2007 = 100

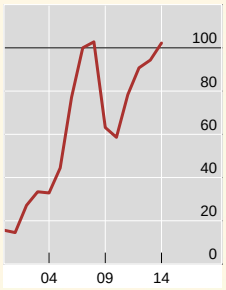
Spain



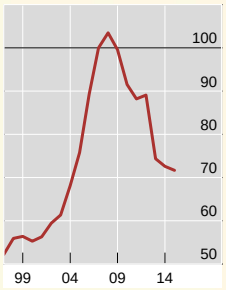
Ireland



Latvia



Croatia



Source: National data.

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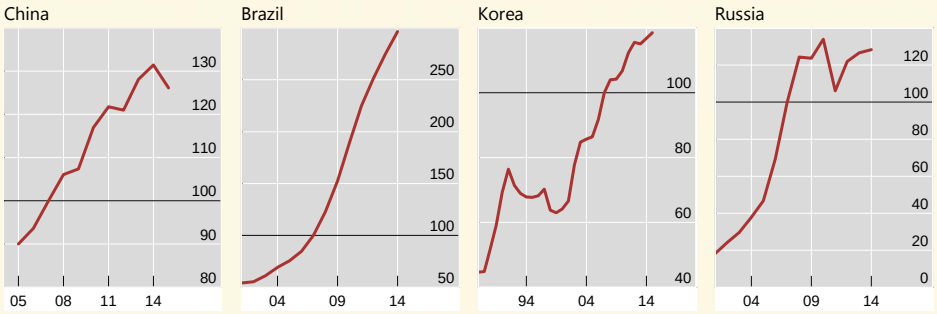
Stylised facts on house prices in selected countries

House prices, annual averages, 2007 = 100



Source: National data.

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Modelling house price dynamics

Three main approaches in empirical models:

1. Housing is similar to other assets → study housing markets with the aid of asset pricing theories
2. Housing is a durable consumption good financed mainly with credit → study demand- and supply-side determinants in housing and credit markets
3. Indicators approach: discern the state of the housing market from changes in a number of indicators without referring to a single theoretical model (≈ monetary conditions index)

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Asset pricing approach

- Living in a house one owns / selling it and moving to rental housing are two alternative "assets" to be priced
- Compare cost of these alternatives to determine signs of mispricing in one market or another
- Equilibrium: when the expected annual cost of owning a house equals that of renting it

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Asset pricing approach (cont'd)

- The cost of homeownership includes:
  - Maintenance costs
  - Interest lost because funds were used to buy the house
  - Any capital loss on the property
  - Tax benefits (reduce the cost); risk aversion on the behalf of property owners (raises the cost)
- Important early contribution by Poterba (QJE, 1984)
- Himmelberg et al (JEP, 2005) argue that US house prices were not significantly out of line with theoretical predictions at the time
- Data on rents limited outside the US; where available often not useful for empirical work (not much variation due to widespread rent controls, poor coverage, etc)

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Asset pricing approach (cont'd)

Equilibrium: expected annual cost of owning must equal the cost of renting every year

- Let r be the constant risk free real rate of interest
- $\rho(t)$ the annual rent for year t for a standard unit of housing (assumed due at the end of the year)
- $P(t)$ the price of a standard unit of housing at the start of year t and $E(t)$ expectations conditional on time t information
- In equilibrium: $\rho(t) = r \cdot P(t) - E(t)[P(t+1)-P(t)]$
- The assumption of no bubbles gives:

$$P(t) = \rho(t)/(1+r) + E(t)[\rho(t+1)/(1+r)^2] + \ldots$$

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Asset pricing approach (cont'd)

The no bubble solution would seem to have two strong implications:

As a modern asset pricing equation, it suggests that only new information about economic fundamentals (rents, interest rates) influences house prices

- However, forecastable movements in fundamentals will generate predictable movements in house prices
- For example, with mean reversion in interest rates a rise in rates will drive down house prices initially; yet house prices will subsequently rise as rates fall back to their long-run average
- This will generate a positive relation between lagged changes in interest rates and house price growth

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Asset pricing approach (cont'd)

The other strong implication follows from the fact that house prices are an expected present value of future rents. This suggests that interest rates are likely to be a very important determinant of house prices

- Indeed Himmelberg et al. (2005, p 78) state "a one percentage point decline in real interest rates could raise house prices by as much as 19%"

The asset pricing approach is arguably the favorite approach of macroeconomists when developing theoretical models of house prices

However, the theoretical underpinnings of the approach do not appear to be particularly strong

- For example, there are large costs to switching between owner occupied and rental housing

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Preliminary results – full sample

Dependent Variable: dlog(rHP)
52 countries, 1967–2013, 1,000 obs, adj. R^2 0.56

dlog(rHP(–1))	0.466	***	d(IR)	–0.001	
dlog(rHP(–2))	–0.078	***	d(IR(–1))	–0.001	
dlog(rHP(–3))	0.076	***	d(IR(–2))	–0.001	
dlog(rGDP)	1.062	***	d(IR(–3))	–0.001	
dlog(rGDP(–1))	–0.668	***	d(IR(–4))	–0.001	
dlog(rGDP(–2))	–0.008		d(IR(–5))	–0.002	***
dlog(rGDP(–3))	–0.071		dlog(totEMP)	0.359	***
dlog(DomCR)	0.266	***	dlog(totEMP(–1))	–0.138	
dlog(DomCR(–1))	–0.037		dlog(totEMP(–2))	0.174	
dlog(DomCR(–2))	–0.020		dlog(totEMP(–3))	–0.150	
dlog(DomCR(–3))	–0.153	***			

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Highlights – full sample

- Strong evidence against the random walk model for house prices – house prices are highly persistent
- This is not automatically evidence against the asset pricing approach with rational expectations
- However, the coefficients on interest rates appear to violate some predictions of the model in terms of size and sign
- It seems as though increases in interest rates reduce the demand for housing only very gradually: a 100 basis point increase in the nominal short rate reduces real house prices by just 1.50% over the course of five years

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Highlights – full sample (cont'd)

- Interest rate coefficients are small relative to the predictions of the asset pricing model
- But there might also be something wrong with the sign of lagged coefficients:
  - If interest rates are mean reverting, *IR* ↑ at *t* will lead to *HP* ↓ at *t*, the result we get
  - But if interest rates are mean reverting, they will (in the absence of other shocks) slowly fall over time, and this will put upward pressure on house prices
  - So *IR* ↑ at *t–1*,… ,*t–j* could be associated with *increasing* house prices. But we consistently get *negative* coefficients on lagged interest rates
  - One explanation could be that rising interest rates reduce the demand for housing only gradually over time, not in one big jump as the asset pricing model would predict

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Smaller sample, countries with longer series

Dependent Variable: dlog(rHP)
28 countries, 1967–2013, 825 obs, adj. R^2 0.59

dlog(rHP(–1))	0.548	***	d(IR)	–0.003	***
dlog(rHP(–2))	–0.105	***	d(IR(–1))	–0.005	***
dlog(rHP(–3))	0.071	**	d(IR(–2))	–0.001	
dlog(rGDP)	0.678	***	d(IR(–3))	–0.003	***
dlog(rGDP(–1))	–0.576	***	d(IR(–4))	–0.001	
dlog(rGDP(–2))	0.191	*	d(IR(–5))	–0.003	***
dlog(rGDP(–3))	–0.015		dlog(totEMP)	0.145	
dlog(DomCR)	0.395	***	dlog(totEMP(–1))	0.169	
dlog(DomCR(–1))	–0.134	***	dlog(totEMP(–2))	–0.022	
dlog(DomCR(–2))	–0.071		dlog(totEMP(–3))	0.004	
dlog(DomCR(–3))	–0.162	***			

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Highlights – smaller sample

- We obtain stronger evidence that the coefficients on interest rates are negative with the smaller sample
- But they are still small in magnitude: a 100 basis point increase in the nominal short rate reduces real house prices by 3.50% over the course of five years

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Highlights – smaller sample (cont'd)

- The negative sign of the coefficient on lagged GDP growth suggests a potentially important role for *measurement error in GDP* that is contemporaneously correlated with house prices
- On average, the measurement error is zero
- A high positive value for the measurement error at time *t–1* will push up reported GDP growth from *t–2* to *t–1*
- It will also temporarily push up house prices at *t–1*
- But it push down HP growth from *t–1* to *t*: this might explain the consistently negative coefficient on GDP(t-1)

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Full sample, without domestic credit

Dependent Variable: dlog(rHP)
52 countries, 1966–2013, 1,016 obs, adj. R^2 0.51

dlog(rHP(–1))	0.506	***	d(IR)	–0.001	
dlog(rHP(–2))	–0.086	**	d(IR(–1))	–0.001	
dlog(rHP(–3))	0.063	**	d(IR(–2))	–0.002	*
dlog(rGDP)	1.267	***	d(IR(–3))	–0.001	
dlog(rGDP(–1))	–0.677	***	d(IR(–4))	–0.002	*
dlog(rGDP(–2))	–0.043		d(IR(–5))	–0.002	**
dlog(rGDP(–3))	–0.190	*	dlog(totEMP)	0.489	***
			dlog(totEMP(–1))	–0.065	
			dlog(totEMP(–2))	0.213	
			dlog(totEMP(–3))	–0.212	*

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Highlights – full sample without credit

- Coefficients on interest rates do not become larger in absolute value when we drop credit growth
- A 100 basis point increase in the nominal short rate reduces real house prices by 1.67% over the course of five years

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Full sample, with global factors (1)

Dependent Variable: dlog(rHP)
52 countries, 1986–2013, 825 obs, adj. R^2 0.57

dlog(rHP(–1))	0.418	***	d(IR)	–0.001	
dlog(rHP(–2))	–0.070	*	d(IR(–1))	–0.000	
dlog(rHP(–3))	0.073	**	d(IR(–2))	0.000	
dlog(rGDP)	1.177	***	d(IR(–3))	0.001	
dlog(rGDP(–1))	–0.632	***	d(IR(–4))	–0.001	
dlog(DomCR)	0.279	***	d(IR(–5))	–0.002	*
dlog(DomCR(–3))	–0.112	***	dlog(totEMP)	0.358	**
			VIX	0.000	
			US_LTIR	–0.002	**

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Highlights – full sample with global factors

- VIX as a global factor is not a significant determinant of changes in house prices
- But the levels of long- and short-term US interest rates do seem to matter as global factors…
- In terms of the magnitude, the level of long-term US rate seems to have a bigger impact on changes in house prices than that of the short-term rate
- Coefficients on the level of long-term US rate and on changes in domestic interest rates suggest that a 100 basis point increase in the US long-term rate reduces real house prices by 1.57% over the course of five years

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Full sample, countries with mortgage refinancing

Dependent Variable: dlog(rHP) {US, GB, AU, CA, NZ}, 1986–2013, 136 obs, adj. R^2 0.57					
dlog(rHP(–1))	0.572	***	d(IR)	–0.002	
			d(IR(–1))	–0.019	***
			d(IR(–2))	0.002	
dlog(rGDP)	0.896	***	d(IR(–3))	0.003	
			d(IR(–4))	–0.001	
dlog(DomCR)	0.341	**	d(IR(–5))	–0.005	**
			VIX	–0.0003	*
			US_LTIR	–0.002	***

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Highlights – countries with mortgage refinancing

- VIX as a global factor becomes a significant determinant of changes in house prices
- Level of US long-term interest rates also seems to matter as a global factor
- In terms of the magnitude, the level of long-term US rate seems to have a bigger impact on changes in house prices than that of the short-term rate
- A 100 basis point increase in the US long-term rate reduces real house prices by 2.25% over the course of five years (0.75% in the case of short-term rates)
- Puzzlingly, neither the VIX nor the levels of US long- and short-term rates seem to be significant determinants of changes in US house prices (sample since 1986 too short?)

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Next paper: housing demand and supply

Demand-side determinants

- real disposable income
- real interest rates – 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
- external demand (eg vacation homes in southern Europe)

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Supply-side determinants

- land for development – ideally: data on availability/relative scarcity and price
- construction costs – construction wages, material costs

Institutional factors

- how developed is the housing finance market
  - types of housing loans (incl. FX)
  - 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

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

- Examine deviations of actual from equilibrium prices:
  - (i) component driven by short-run dynamics
  - (ii) residual component that cannot be explained by short-run dynamics

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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 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"

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Appendix

Additional data on housing markets in CEE and selected European countries

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Changes in house prices (in percent)

Cumulative changes

	LV	LT	EE	BG	CZ	SK	PL	ES	SI	HR	AT	IE	HU	CH	DE	RO
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

Average annual growth rates

	LV	EE	LT	BG	PL	SK	SI	CZ	ES	IE	HR	HU	RO	AT	CH	DE
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, 6]	–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 Q2 2013; for Bulgaria, Ireland and Switzerland, Q3 2013. [4] For Latvia and Estonia, house prices dropped by 57% and 53%, respectively, from the peak level to post-crisis trough. Thereafter, house prices rebounded from the post-crisis trough level by 62% and 57%, respectively. [5] For Austria (Vienna), the average annual increase in house prices from Q4 2007 to Q2 2013 was 10.2%. [6] For Latvia and Estonia, the average annual decline in house prices was 25% and 28%, respectively, from the peak level to post-crisis trough. Thereafter, house prices rebounded from the post-crisis trough with an average annual growth of 30% and 20%, respectively.

Sources: National data; authors' calculations.

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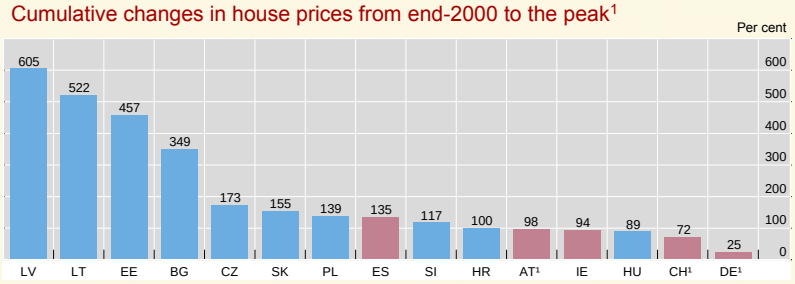
Cumulative changes in house prices from end-2000 to the peak[1]



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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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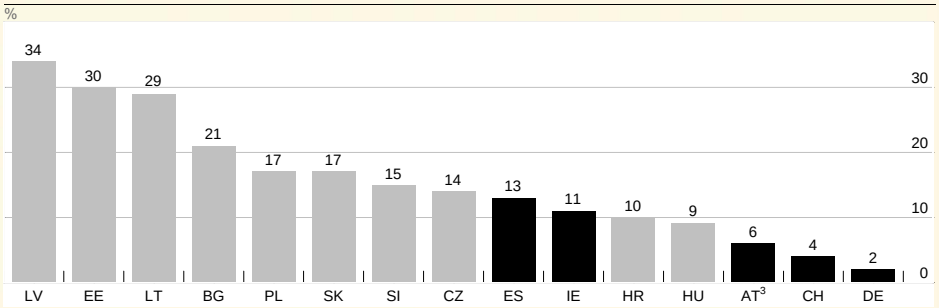
Average annual growth in house prices from end-2000 to the peak[1,2]



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[1] For Poland and Slovakia, from 2002; Slovenia from 2003. [2] For Austria, Germany and Switzerland, changes in house prices from end-2000 to the latest observation. [3] For Austria (Vienna), the average annual increase in house prices from Q4 2007 to Q2 2013 was 10.2%.

Sources: National data, BIS calculations.

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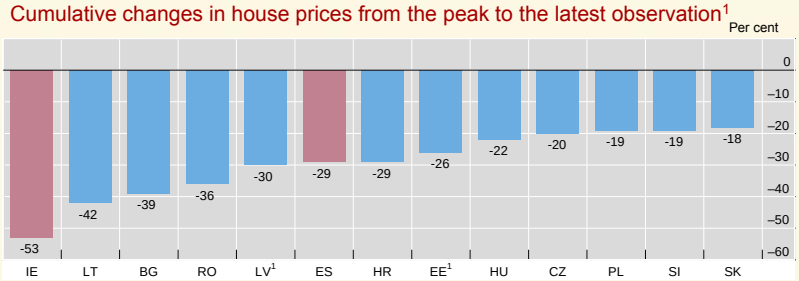
Cumulative changes in house prices from the peak to the latest observation[1]



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

[1] 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.

Source: national data.

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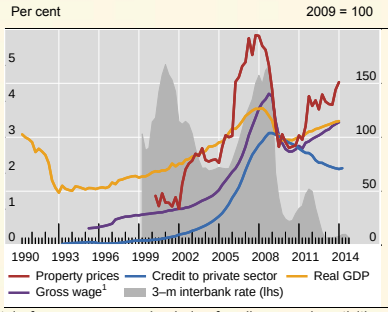
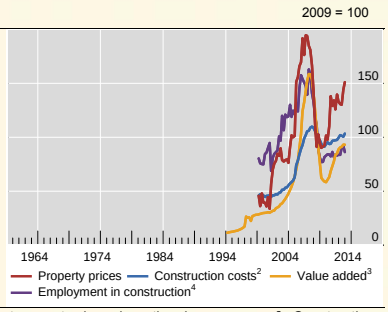
Latvia – residential property prices in urban areas, existing and new flats

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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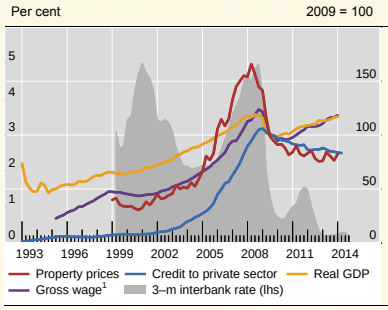
BANK FOR INTERNATIONAL SETTLEMENTS

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

Demand side of the housing market



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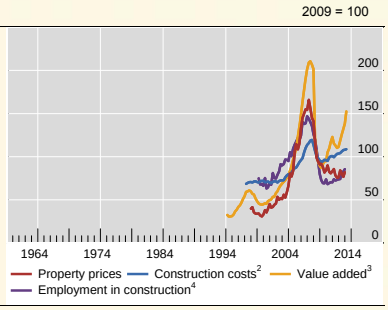


[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic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

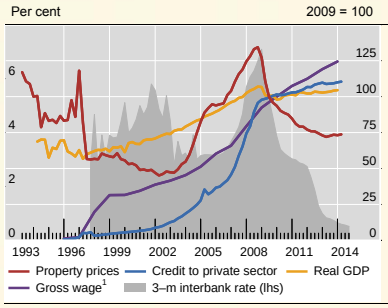
Sources: Lithuanian State Enterprise Centre of Registers; Eurostat; Datastream; national data.

38

BANK FOR INTERNATIONAL SETTLEMENTS

Bulgaria – residential property prices in big cities, existing flats

Demand side of the housing market



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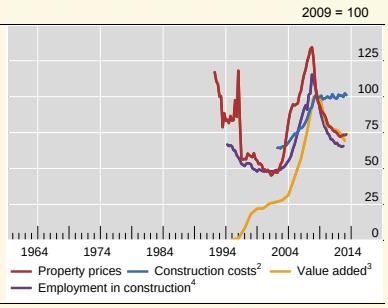


[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic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

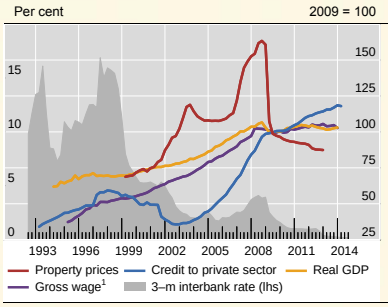
Sources: Eurostat; Datastream; national data.

39

BANK FOR INTERNATIONAL SETTLEMENTS

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

Demand side of the housing market



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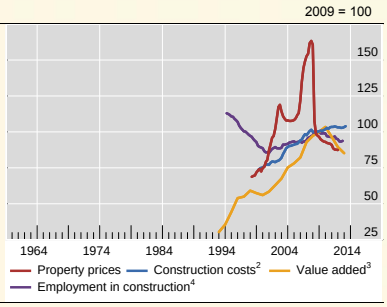


[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic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

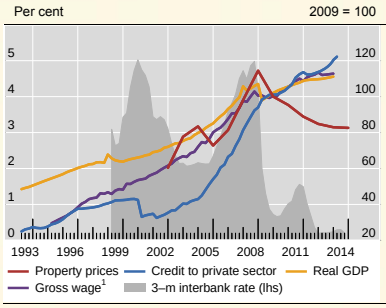
Sources: Eurostat; Datastream; national data.

40

BANK FOR INTERNATIONAL SETTLEMENTS

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

Demand side of the housing market



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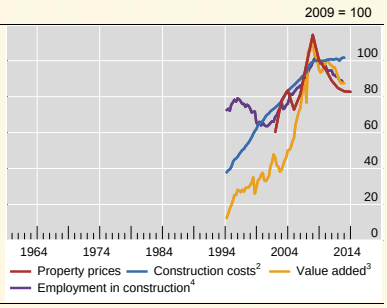


[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic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

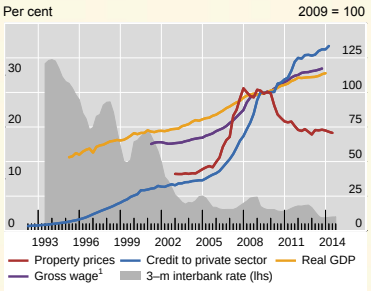
Sources: Eurostat; Datastream; national data.

41

BANK FOR INTERNATIONAL SETTLEMENTS

Poland – residential property prices in Warsaw, new flats

Demand side of the housing market



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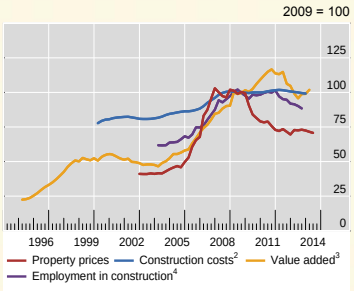


[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic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

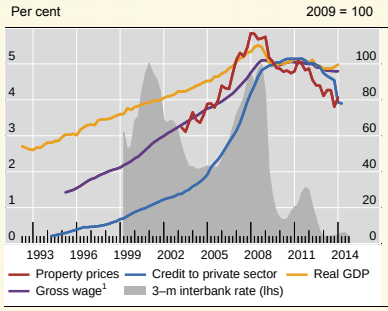
Sources: Eurostat; Datastream; national data.

42

BANK FOR INTERNATIONAL SETTLEMENTS

Slovenia – residential property prices in whole country, 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.

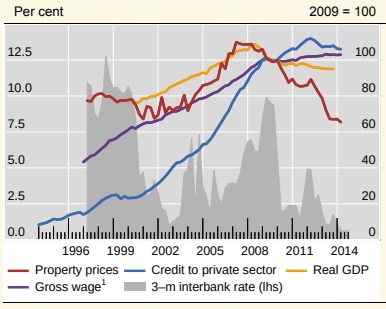
Sources: Eurostat; Datastream; national data.

43

BANK FOR INTERNATIONAL SETTLEMENTS

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

Demand side of the housing market



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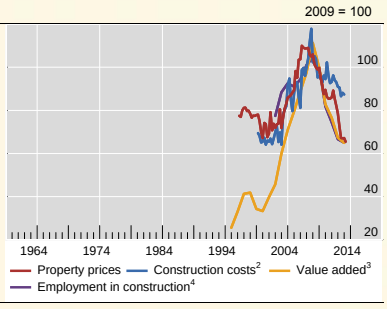

[1] Average monthly gross wage; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic prices; in national currency. [4] Total employment in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

Sources: Eurostat; Datastream; national data.

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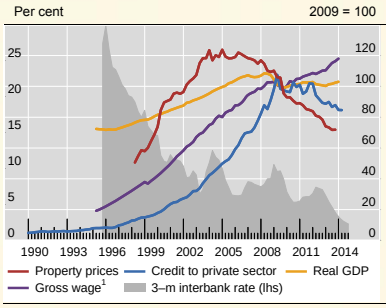
BANK FOR INTERNATIONAL SETTLEMENTS

Hungary – residential property prices in whole country

Demand side of the housing market



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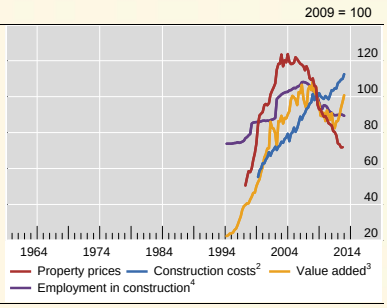


[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic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

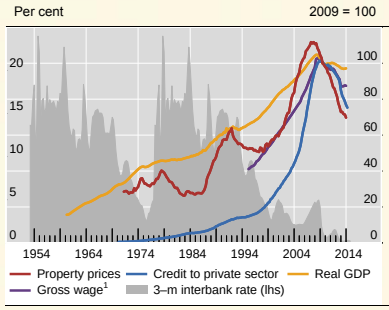
Sources: FHB Banking Group; Eurostat; Datastream; national data.

45

BANK FOR INTERNATIONAL SETTLEMENTS

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

Demand side of the housing market



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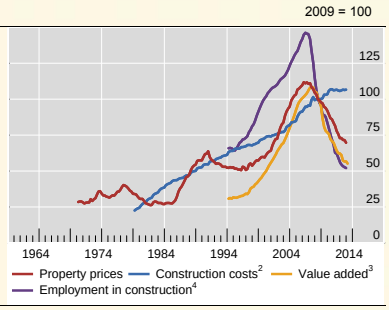


[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic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

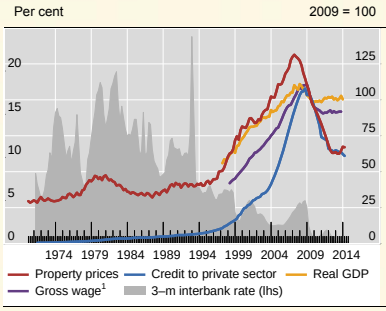
Sources: Eurostat; Datastream; national data.

46

BANK FOR INTERNATIONAL SETTLEMENTS

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

Demand side of the housing market



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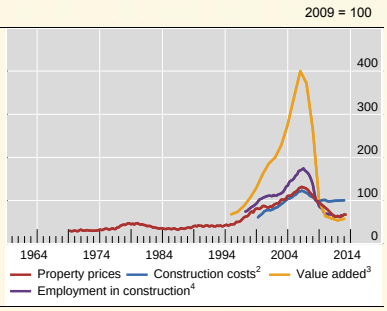

[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic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

Sources: Eurostat; Datastream; national data.

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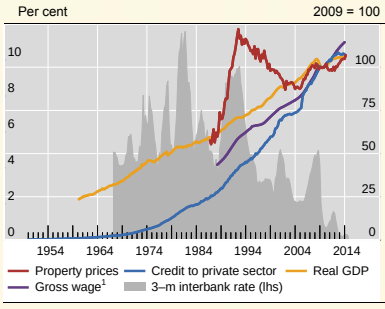
BANK FOR INTERNATIONAL SETTLEMENTS

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

Demand side of the housing market



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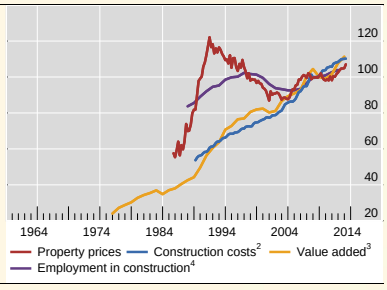

[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic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

Sources: Eurostat; Datastream; national data.

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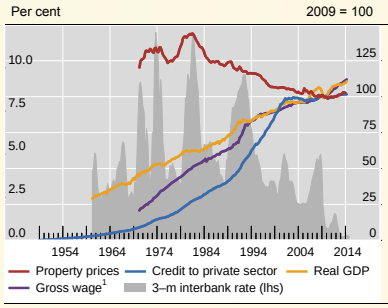
BANK FOR INTERNATIONAL SETTLEMENTS

Germany – residential property prices in West Germany, new flats

Demand side of the housing market



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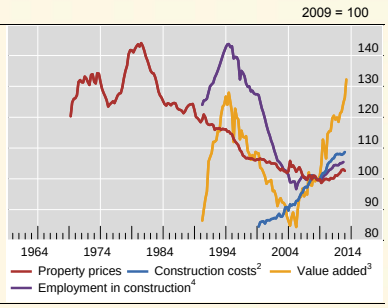

[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Construction cost index of new residential buildings, except residences for communities; gross data in national currency. [3] Gross value added of the construction industry; at current basic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

Sources: Eurostat; Datastream; national data.

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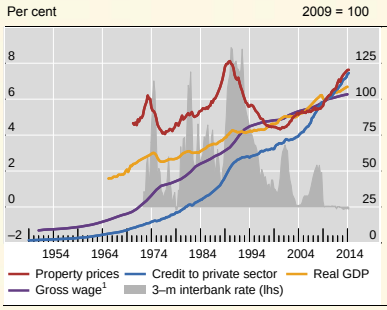
BANK FOR INTERNATIONAL SETTLEMENTS

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

Demand side of the housing market



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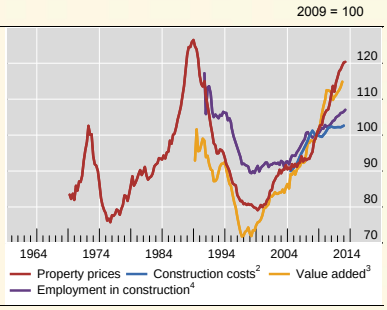

[1] Total of gross wages and salaries for all economic activities; at current prices; in national currency. [2] Gross value added of the construction industry; at current basic prices; in national currency. [3] Total employment in construction industry; domestic concept.

Sources: Eurostat; Datastream; national data.

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