The interaction between house prices and loans for house purchase. Revised evidence for the Spanish case

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BoF-SUERF Conference
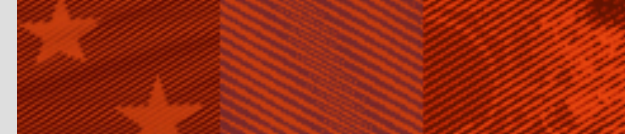4th and 5th June 2009

SERVICIO DE ESTUDIOS

MOTIVATION (I)

- US subprime crisis and its vast consequences has refocused attention on the existing feedback between credit and house prices

- The analysis might merit special attention for the Spanish case

  - **Large increase** in **household indebtedness** and **house prices** between mid-nineties and 2006 (figure 1)

  - These significant increases **might have lead** to **household overindebtedness** and **house prices overvaluation**

  It is relevant:

  - **assessing** (potential) **overindebtedness** and **house price overvaluation**, in order to **evaluate** the **potential scope of correction** in these variables

  - to know the **way in which disequilibria** in these variables are **corrected**

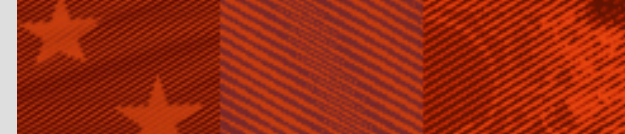# EVOLUTION OF HOUSEHOLD LENDING AND HOUSING PRICES IN SPAIN (back)

- Household debt has increased substantially beteen mid-1990s and 2006 (average annual growth rate: 18%) and decelerated afterwards
- Housing prices showed increasing growth rates between 1997 and 2004 (average annual growth rate in years 1999-2004:16%) and decelerated afterwards

Loans to households   (annual growth rate)

House prices (annual growth rate)
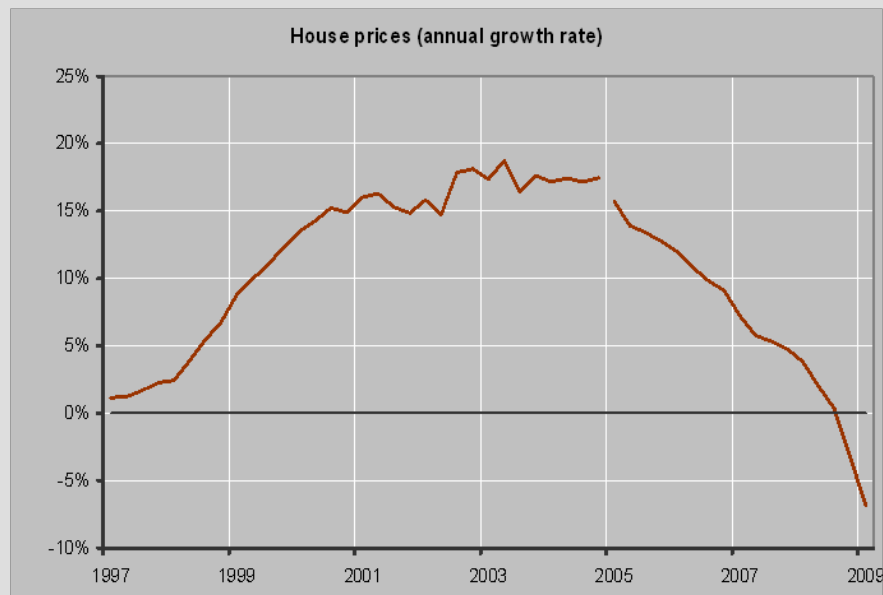
MOTIVATION (II)

- Goal of the paper:

  ➢ analyse **long-run interaction** between **house prices** and **loans for house purchase** in Spain
  ➢ assess if these two variables stand above their **equilibrium levels**
  ➢ analyse **how disequilibria** in these variables **are corrected**

MODELLING LOANS FOR HOUSE PURCHASE AND HOUSING PRICES

- A few papers have analysed empirically the interaction between credit and housing prices
  - In most cases, uniequational models.
    - *Fitzpatrick and McQuinn (2004) for Ireland*

  - Some exceptions:
    - *Brissimis and Vlassopoulos (2009) for Greece; Gerlach and Peng (JBF, 2005) for Hong Kong; Hofmann (2004) for 20 countries.*
    Estimate a long-run relationship for household credit

    - *Gimeno and Martinez-Carrascal (2006) for Spain.*
    Estimate a long-run relationship for household credit and another one for house prices

- This paper: extension of Gimeno and Martinez-Carrascal (2006)
  - Covers period up to 2008 Q4
  - Focus on long-run interaction between house prices and loans for house purchase
  - Includes the stock of housing in the specification
  - Methodology: VECM

# THE DETERMINANTS OF HOUSE PRICES AND LOANS FOR HOUSE PURCHASE
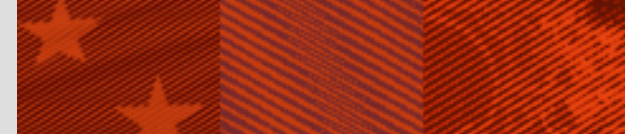
- Loans for house purchase determinants:

  – In complete markets: depend on permanent income and real interest rate

  – With credit market imperfections:

    o *Borrowing restricted by labour income*

    o *Nominal (vs real) interest rates relevant*

    o *Housing prices relevant to determine collateral*

- House prices determinants:

  - Depend on i*ncome, housing stock* and *user cost*

  - Empirically, some problems:

    o *Difficult to estimate the user cost*
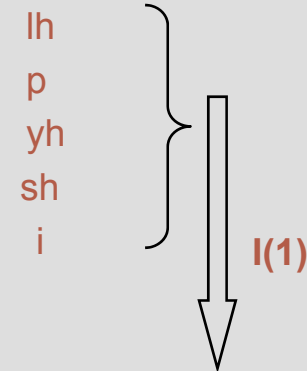
    o *Mortgage financing market*

$$\Delta X_t = \boxed{\alpha\beta X_{t-1}} + \sum \Gamma_j \, \Delta X_{t-j} + \phi \, D_t + \mu + \varepsilon_t \qquad \varepsilon_t \sim N_p(0, \Lambda)$$

User cost

Loans for house purchase (real, per household, logs):   lh
Housing prices (real, logs):   p
Labour income (real, per household, logs):   yh
Housing stock (per household, logs):   sh
Interest rate (nominal):   i

I(1)

– **2 cointegration relationships (Johansen's test)**

Sample: 1984 Q1-2008 Q4

METODOLOGY: VECM

In order to identify the two cointegrating vectors, two restrictions must be imposed in each one:

1) Vector 1:

    i.   Normalisation restriction on loans for house purchase

    ii. Coefficient for dwelling stock equal to the coefficient for house prices (->credit elasticity with respect to housing wealth is estimated)

2) Vector 2

    i.   Normalisation restriction on house prices

    ii. Coefficient for interest rate is set equal to zero (-> impact of interest rates on house prices are captured through loans for house purchase)

	lh_t	p_t	i_t	yh_t	sh_t
β_1	1.00	-0.98	9.20	-0.96	-0.98
std errors		0.10	0.43	0.53	0.00
β_2	-0.54	1.00	0.00	-0.99	7.69
std errors	0.05		0.00	0.33	1.09

ESTIMATION RESULTS
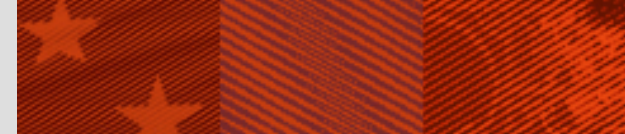
Long-run relationships:

- **Loans for house purchase:**

$$lh = 0.98*(p + sh) + 0.96 * yh - 9.20 * i + Constant$$
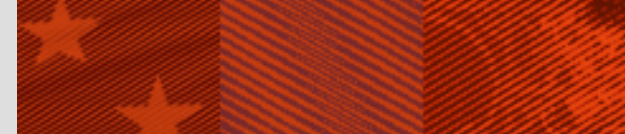$$(\text{std error}) \quad (0.1) \quad - \quad (0.53) \quad (0.43)$$

- **House prices:**

$$p = 0.54 * lh + 0.99 * yh - 7.69 * sh + Constant$$
$$(\text{std error}) \quad (0.05) \quad (0.33) \quad (1.09)$$

> Loans for house purchase and house prices positively linked to yh

> House prices have a positive impact on lh

> Loans for house purchase are positively linked to lh

> Interest rates affect negatively lh (and indirectly also p)
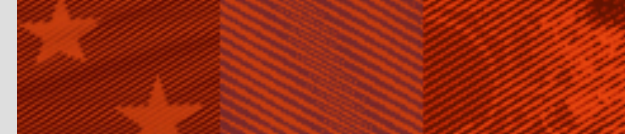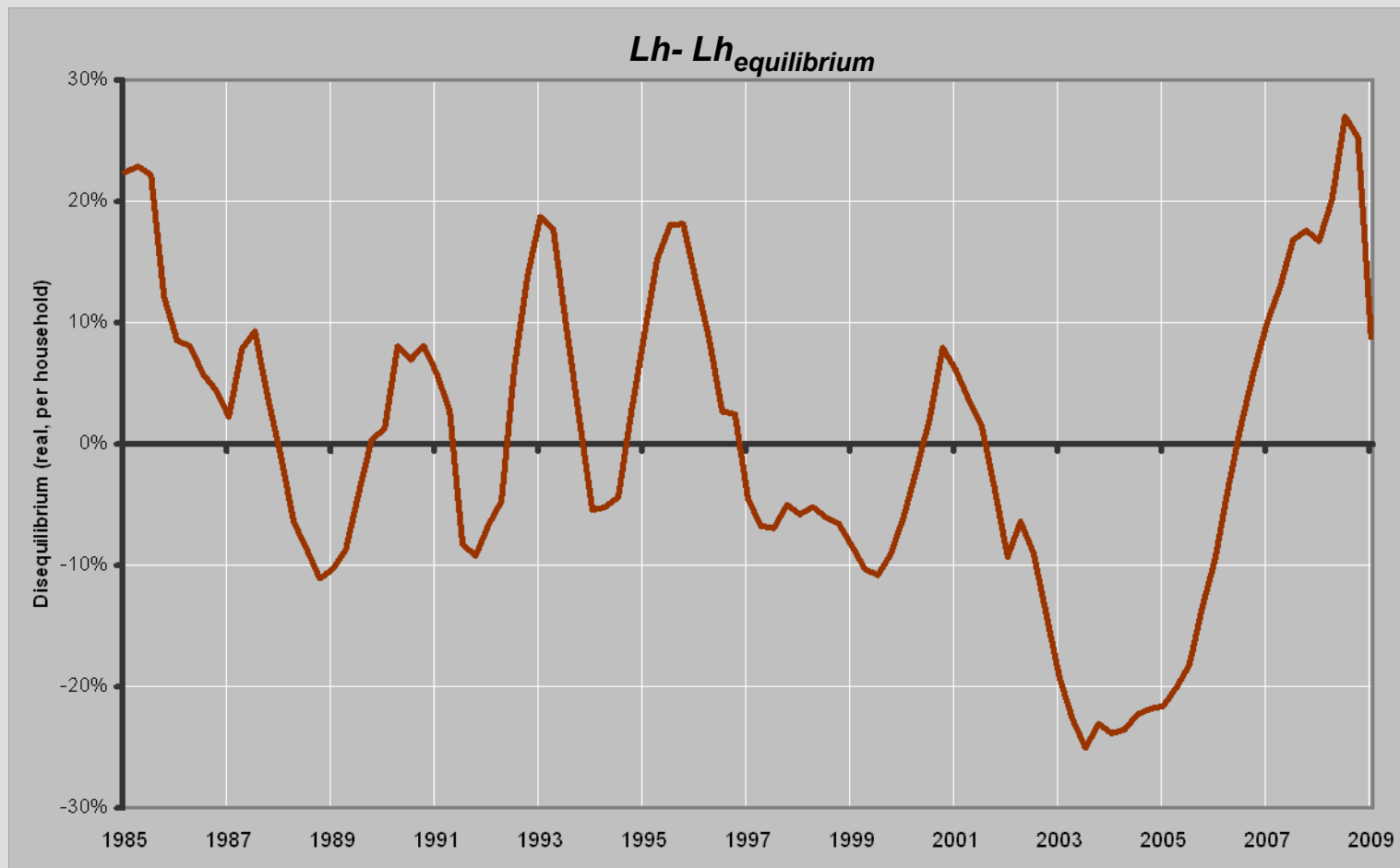
ESTIMATION RESULTS

Loading factors:

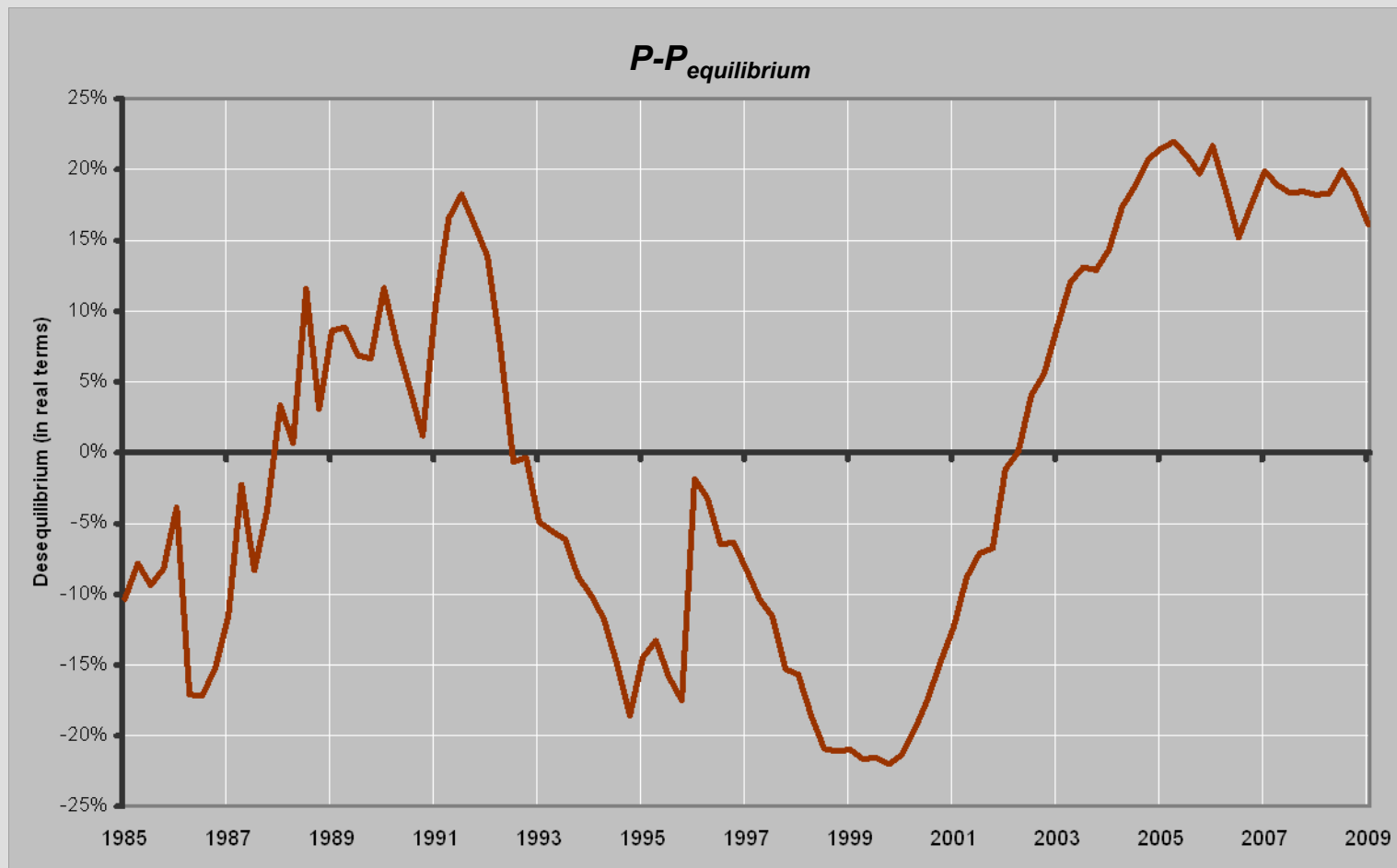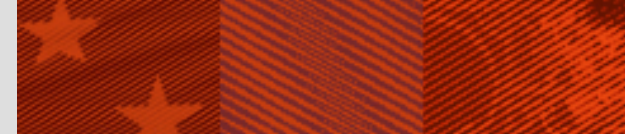| | Disequilibrium in | | | |
| | Vector 1 (lh) | | Vector 2 (p) | |
	α	std errors	α	std errors
Δlh_t	**-0.121**	0.020	**-0.060**	0.025
Δp_t	**-0.092**	0.018	**-0.196**	0.022
Δi_t	-0.016	0.004	-0.013	0.005

➢ Both lh and p adjust when lh, p are above/below their long-run levels

Weak exogeneity assumption for income and dwelling stock accepted [p-value = 0.91]
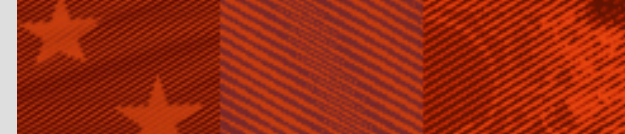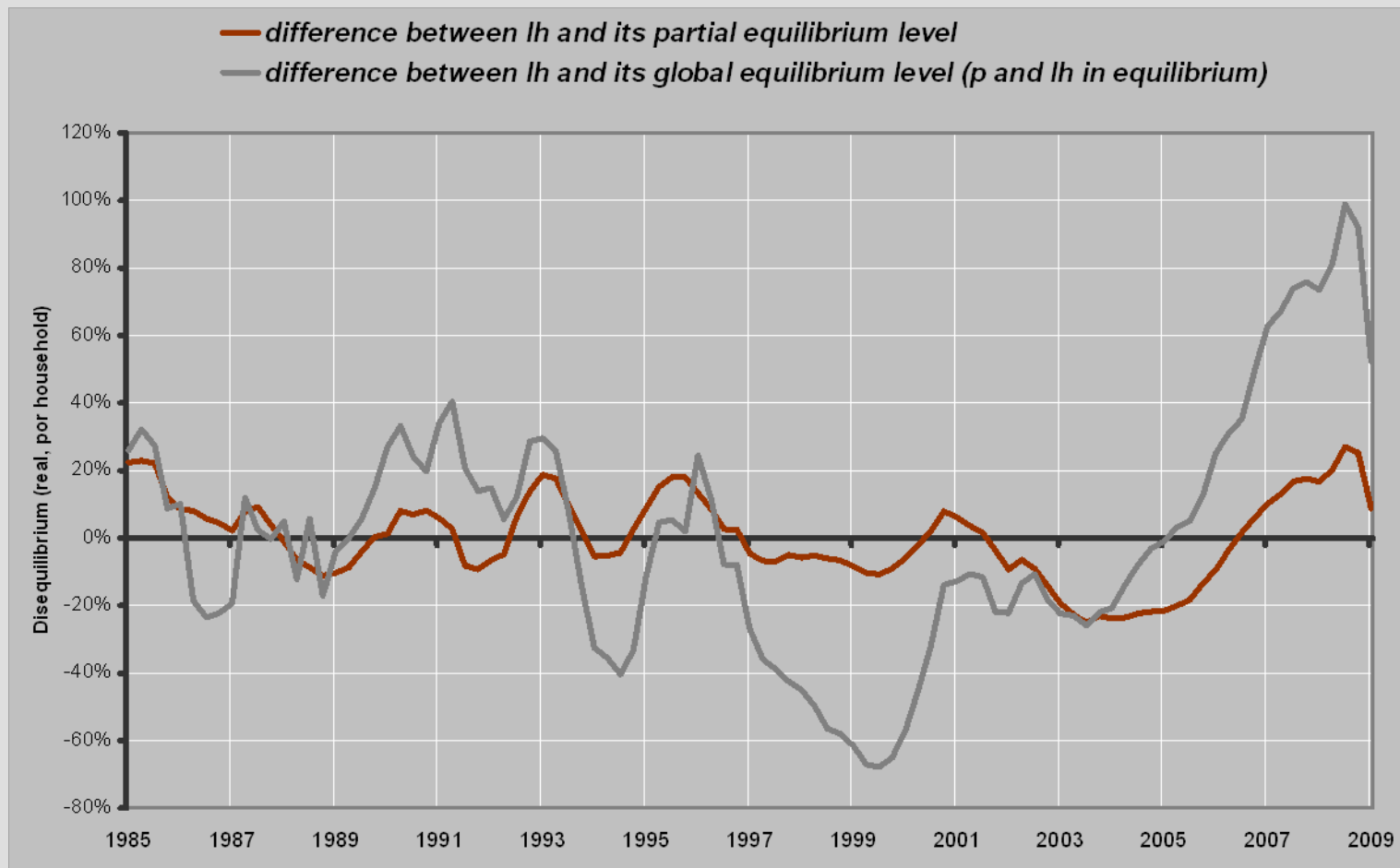
Divergence between loans for house purchase and their long-run level
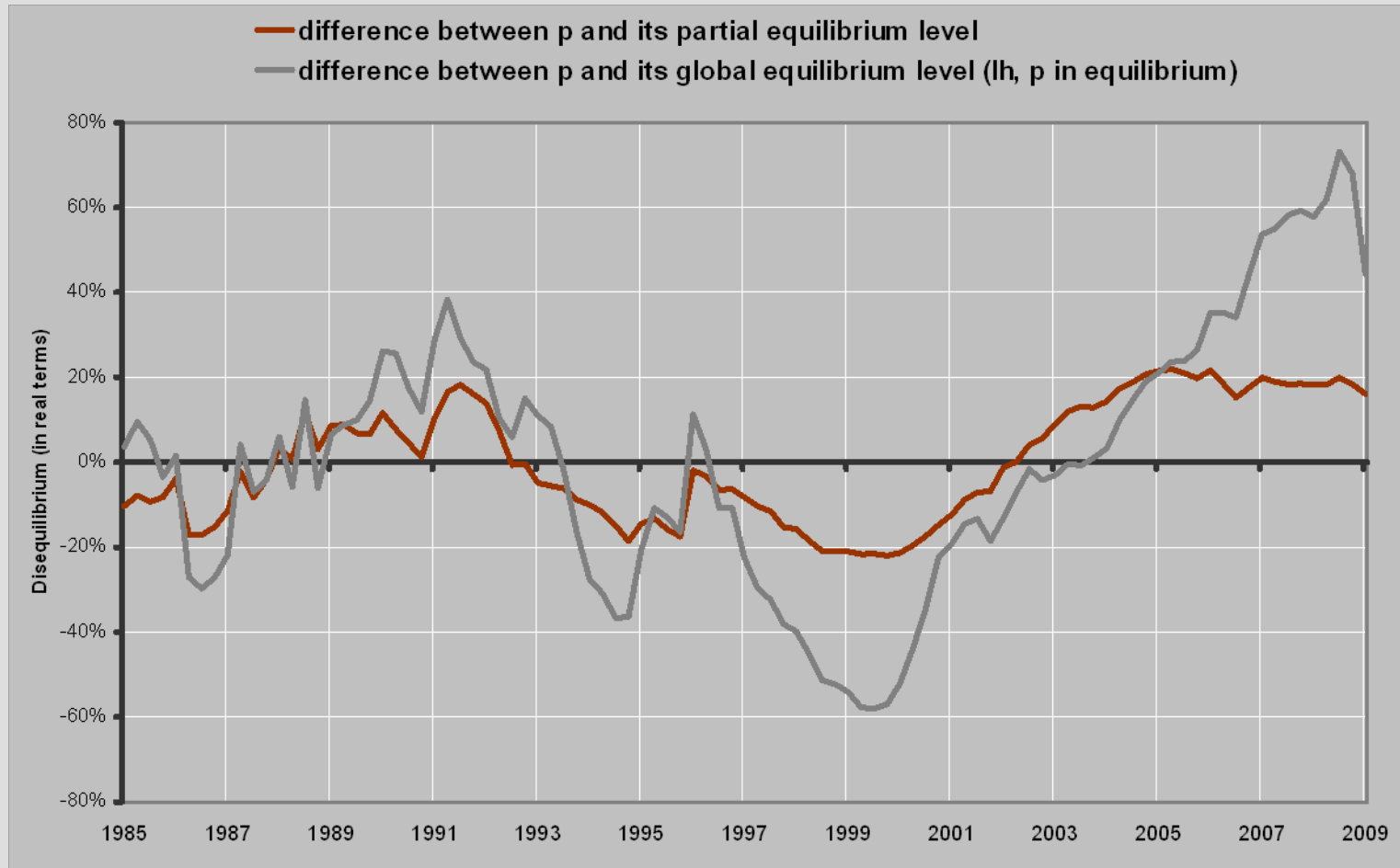

Lh- Lh$_{equilibrium}$

Divergence between house prices and their long-run level

$P-P_{equilibrium}$

Divergence in loans for house purchase with respect to their long-run level

- difference between lh and its partial equilibrium level
- difference between lh and its global equilibrium level (p and lh in equilibrium)

Divergence between house prices and their long-run level

difference between p and its partial equilibrium level
difference between p and its global equilibrium level (lh, p in equilibrium)

CONCLUSIONS

Analysis of the long-run interaction between housing prices (p) and loans for house purchase (lh) . VECM with two cointegrating relationships

- Positive feedback between p and lh

  - both variables positively related to income (elasticity around 1) and negatively related to interest rates. Loans for house purchase (house prices) positively (negatively) liked to the dwelling stock

-Disequilibria correction: feedback from lh (p) disequilibria to p (lh)

  -*Disequilibria in lh*: indebtedness above (below) its long-run level implies reductions (increases) in lh and p

  -*Disequilibria in p*: p above (below) their long-run level imply reductions (increases) in housing prices and loans for house purchase

- Failure to take overvaluation in house prices (overindebtedness) into account can lead to a too benign assessment of potential overindebtedness (house prices overvaluation)

-Prospects:

  -Lh and p were above their long-run equilibrium level at the end of the sample period

  - Adjustments in these variables and/or movements in their fundamentals should be observed to restore the equilibrium

THANK YOU FOR YOUR ATTENTION