

# Comments on Peter Birch Sørensen

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Finanspolitiska rådet, 10 June, 2013

# Rational asset pricing of houses ("fundamental value")

- Price = discounted value of expected future "cash flow"  
(value of housing services).

$$P_t = \frac{R_t^H}{1 + \gamma_t} + \frac{R_{t+1}^{He}}{(1 + \gamma_t)(1 + \gamma_{t+1}^e)} + \dots$$

- In order to apply this, we need to measure (or assume)
  - The value of housing services ( $R^H$ )
  - The discount factor ( $\gamma$ )
    - $\gamma = \text{capital cost after tax} + \text{property tax rate} + \text{depreciation} - \text{expected CPI inflation} + \text{risk premium}$
  - Today and expectations for the future.

# A simple set of assumptions

(Englund, 2012)

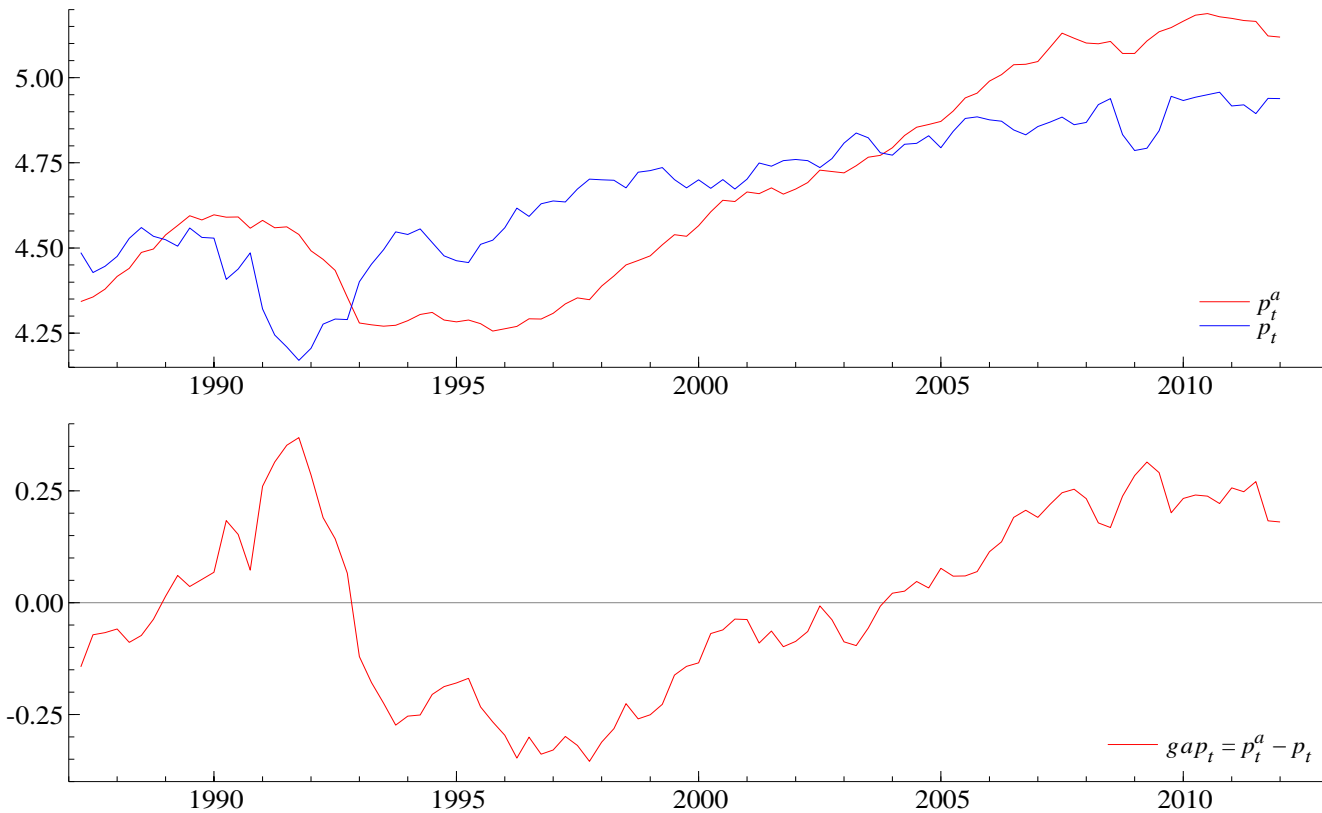
- Value of housing services = fixed proportion of rental apartment index
  - Assumed to grow with expected inflation
- Capital cost after tax = long-term (five-year) mortgage interest rate after tax
- Other items affecting the discount factor are constant.

# We can do better

(Birch Sørensen, 2013)

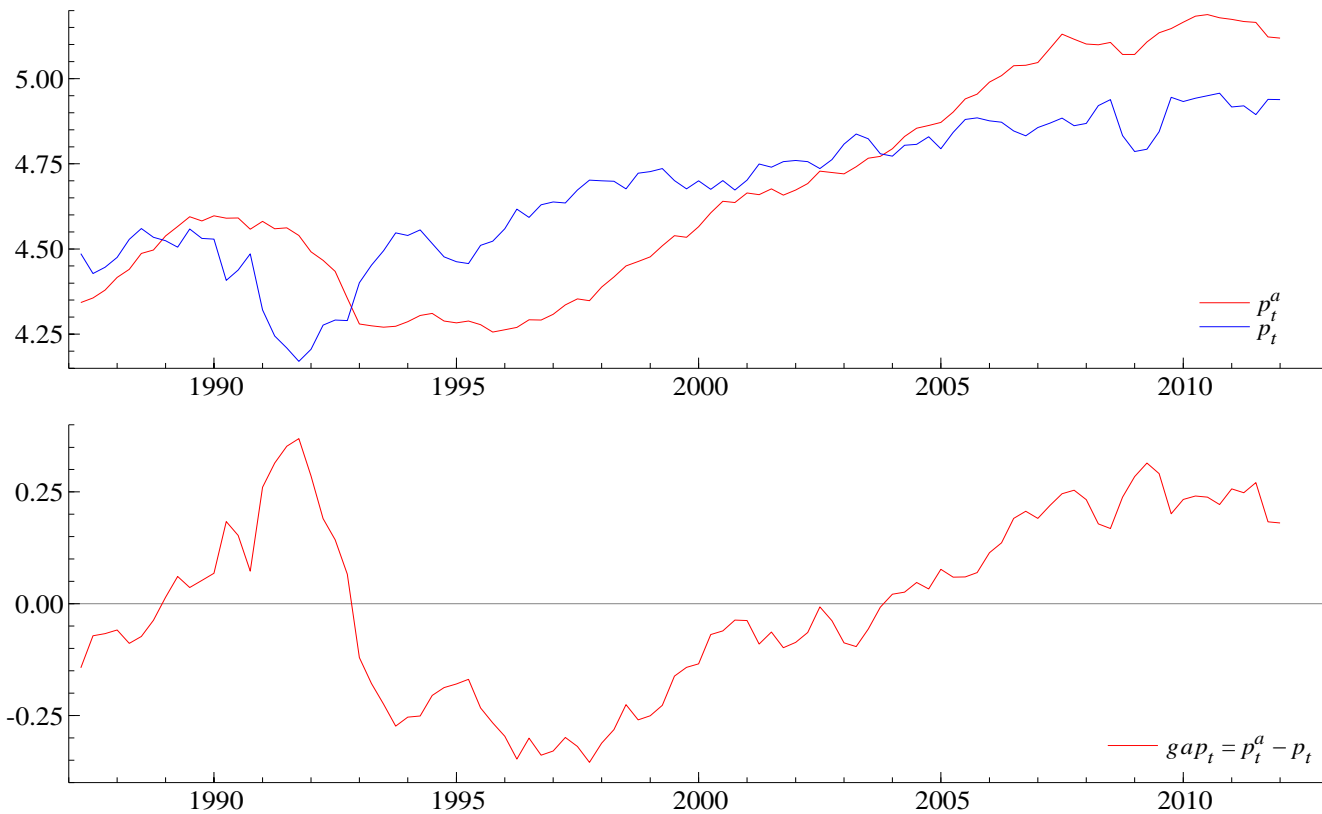
- Assume households to be rational forecasters. Use an econometric time-series model (*VAR*) to generate expected values.
  1. Forecast future rents and discount factors and assume the value of housing services to be proportional to rent.
  2. Forecast income, the housing stock and the discount factor and assume the value of housing services to be a function of income and the housing stock (demand = supply).
- Both models suggest overvaluation 1989-92, undervaluation 1993-2004, overvaluation 2005-2012.
- Fundamental prices fluctuate as much as actual prices (no excess volatility). Note sharp drop in fundamental price in 1990-92.

# Actual and estimated fundamental real house prices (model 1)



Estimated price gap 2012:1 = 18%

# Actual and estimated fundamental real house prices (S-D model, $\varepsilon_Y = 1$ , $\varepsilon_R = 0.5$ )

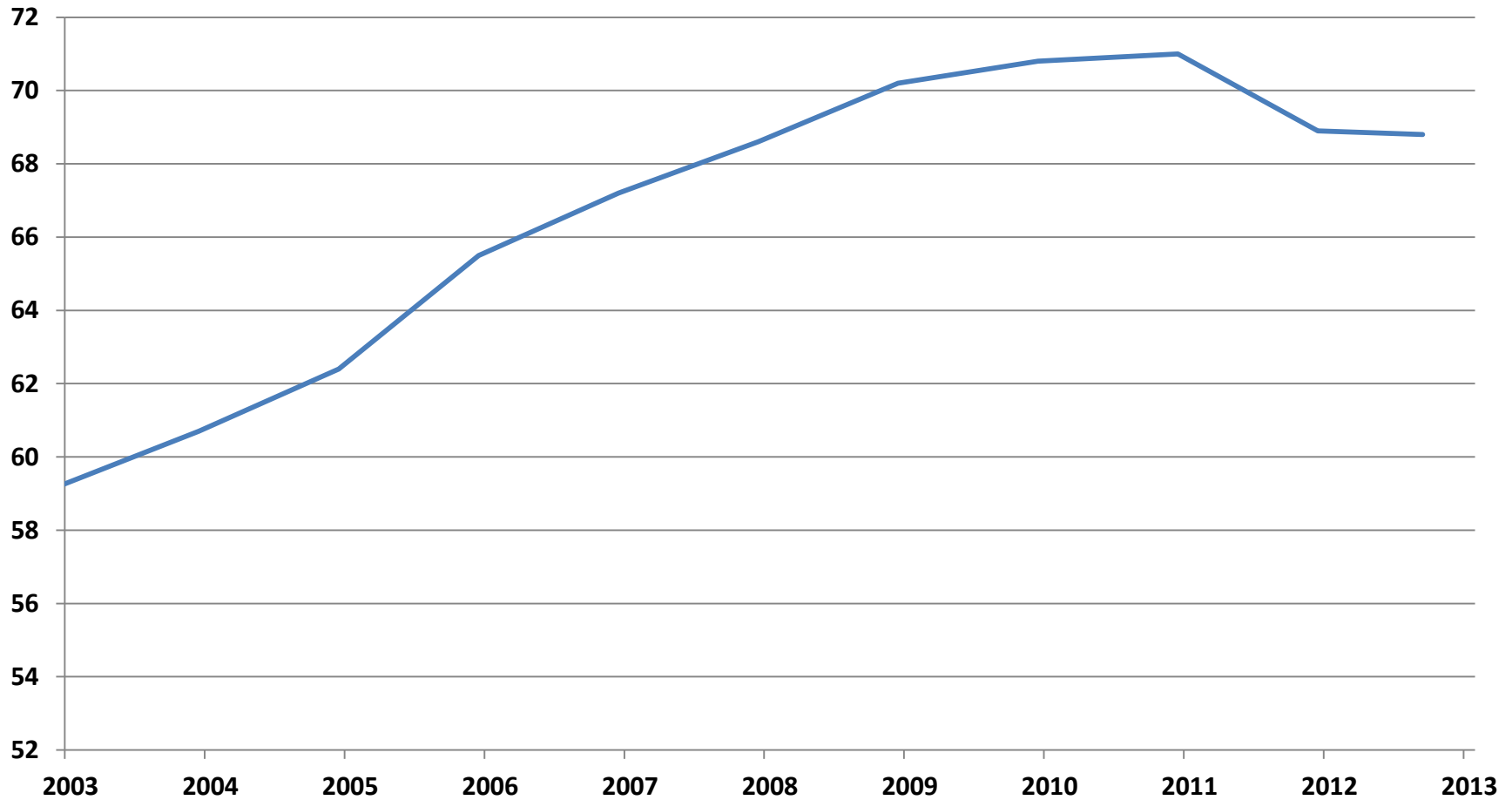


Estimated price gap 2012:1 = 12%

# 12-18 % overvaluation?

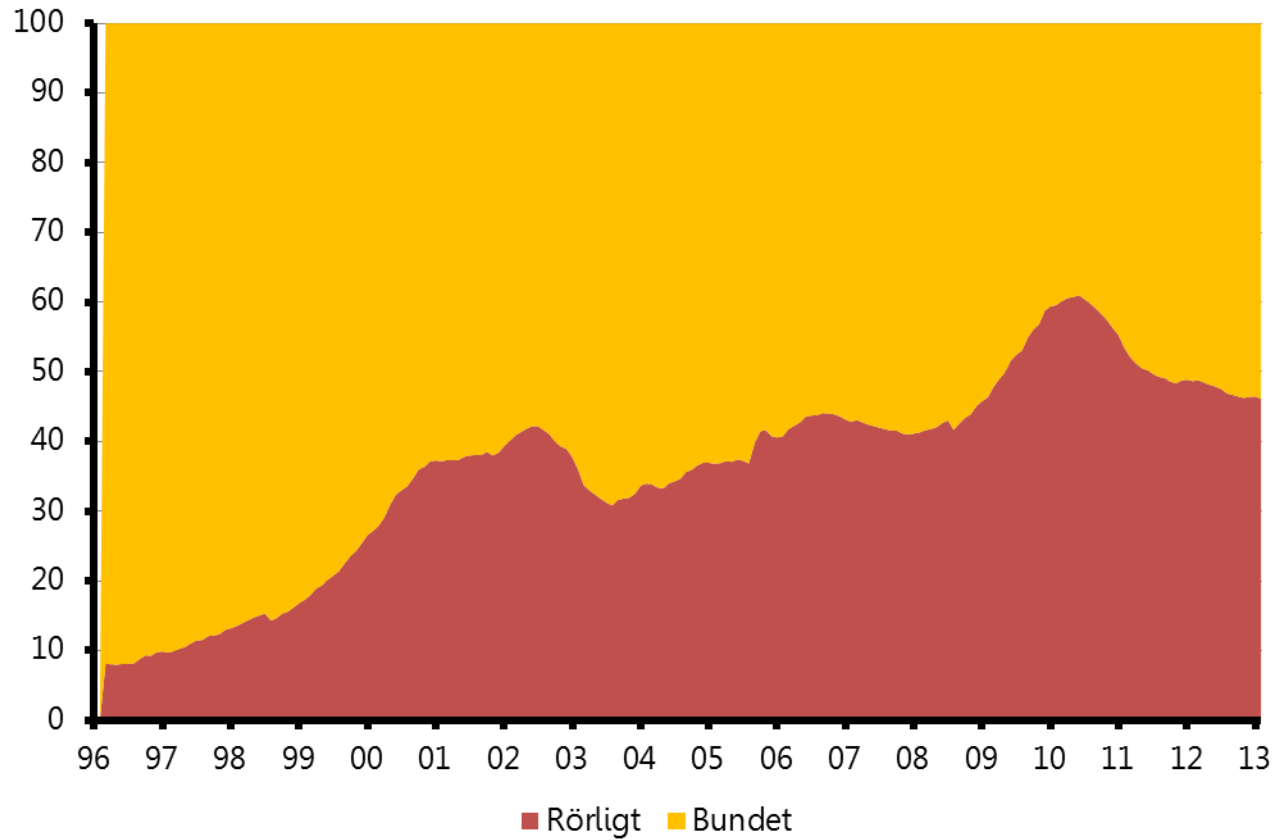
- What are the underlying expectations?
- Normalizing by assuming price = fundamental value, on average 1986-2012
  - But if 2012 is a "bubble"?
- Proportionality between rent and value of housing services?
  - But median queue length for those who got an apartment in Stockholm
    - 2013: 6-8 years
    - 2005: 2-4 years
- Capital costs = mortgage interest rate?
  - But deregulation in the late 1980s. Average LTV has been increasing until the cap in 2012.
  - Households have moved from fixed to flexible-interest loans.

# Loan-to-value, new mortgages





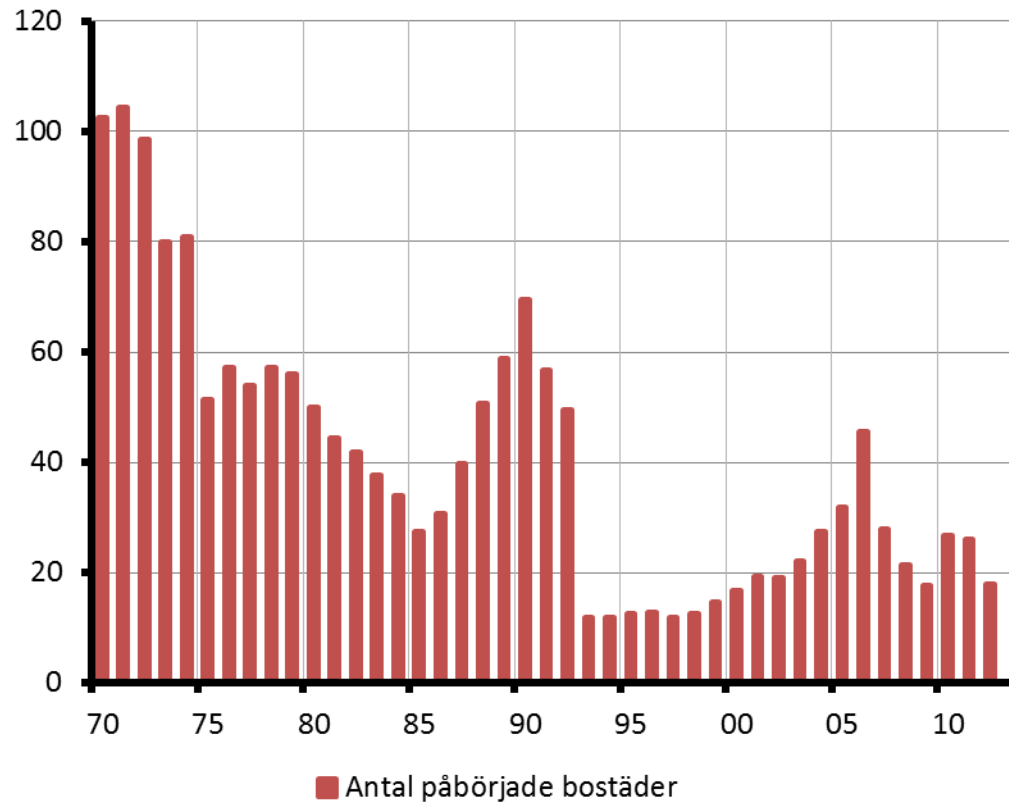
# Fraction of new loans with fixed and flexible interest rates



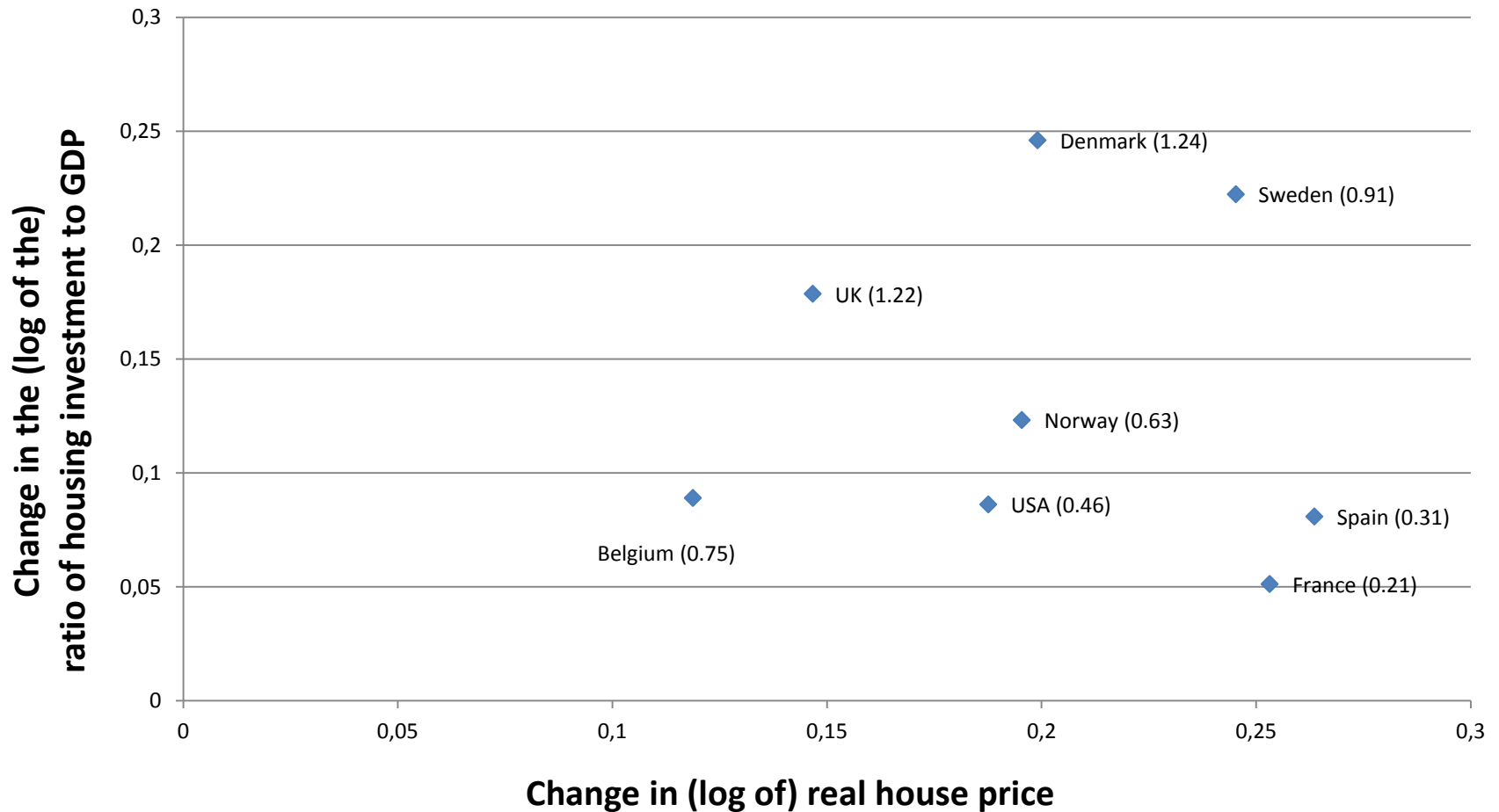
# Fundamental price is contingent on supply

- But new construction is much lower than in early 1990s, even though price relative to construction cost (Tobin's Q) is much higher.
- Yet, changes in housing investment seem responsive to changes in price
  - But supply curve is kinked: very little new construction as long as price is below construction cost and a high elasticity around break even. Hence, relating changes in investment to changes in price in a period of low construction may not be very informative.

# New construction, number of dwellings



# Changes in new construction and price changes, 2000:1 – 2012:1



# Summing up

- Swedish house prices appear somewhat high today relative to fundamentals, conditioning on supply.
- Supply appears low given the level of house prices
  - Regulations?
  - Building industry competition?