

The Swedish housing market: Trends and risks

Presentation by

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The issues

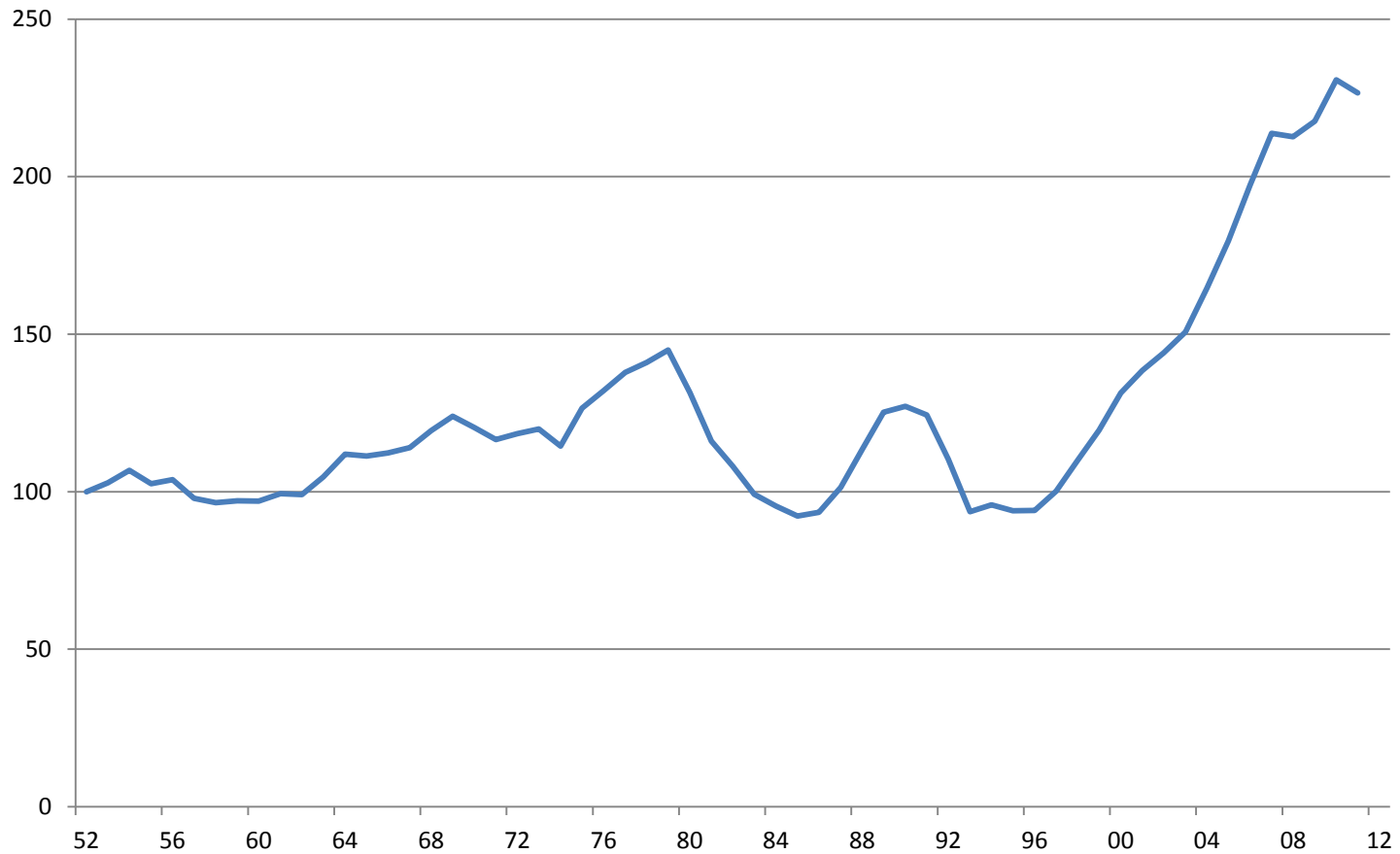
- Are Swedish house prices currently seriously overvalued?
- If so, what are the risks to financial and economic stability in Sweden?
- My report discusses both issues. Here I focus on the first one

Agenda

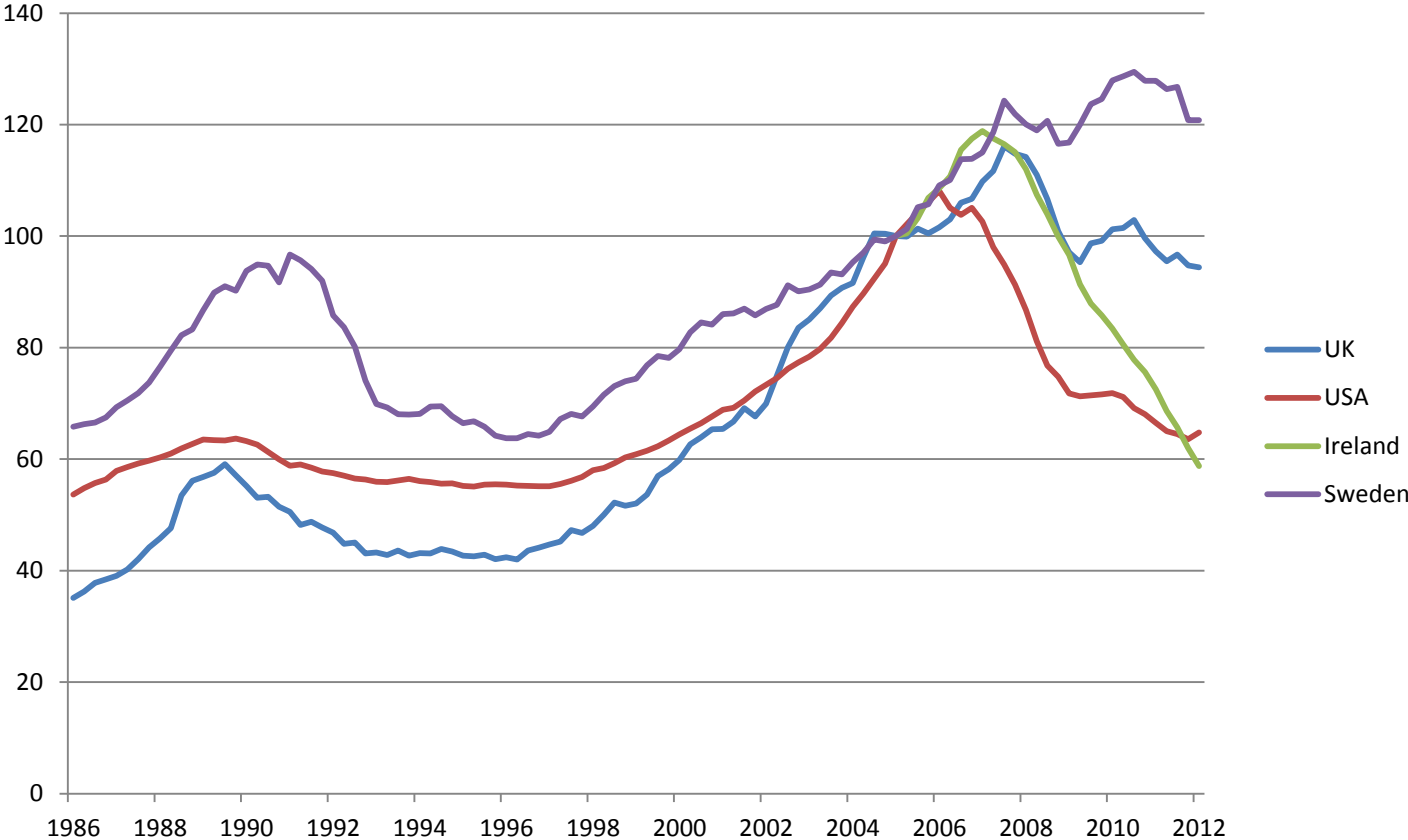
- Swedish house price developments in historical and international perspective
- Can real house prices continue to trend upwards?
- Can recent Swedish house price developments be explained by econometric house price models?
- Are current Swedish house prices out of line with rents and disposable incomes?
- Are actual house prices out of line with fundamental house prices?

The evolution of Swedish house prices

Real house prices in Sweden



Quarterly real house prices in various countries

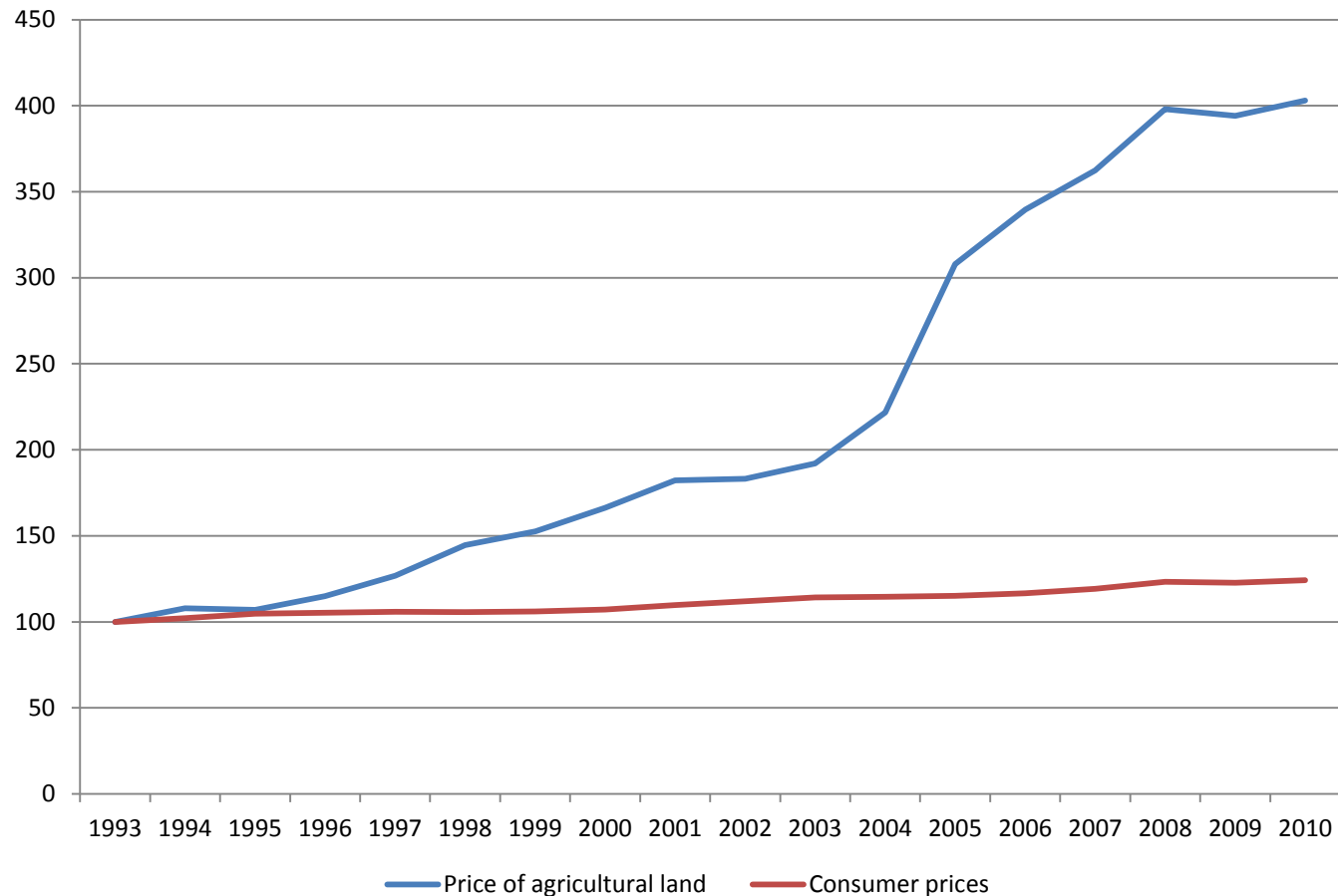


Can real house prices continue to trend upwards?

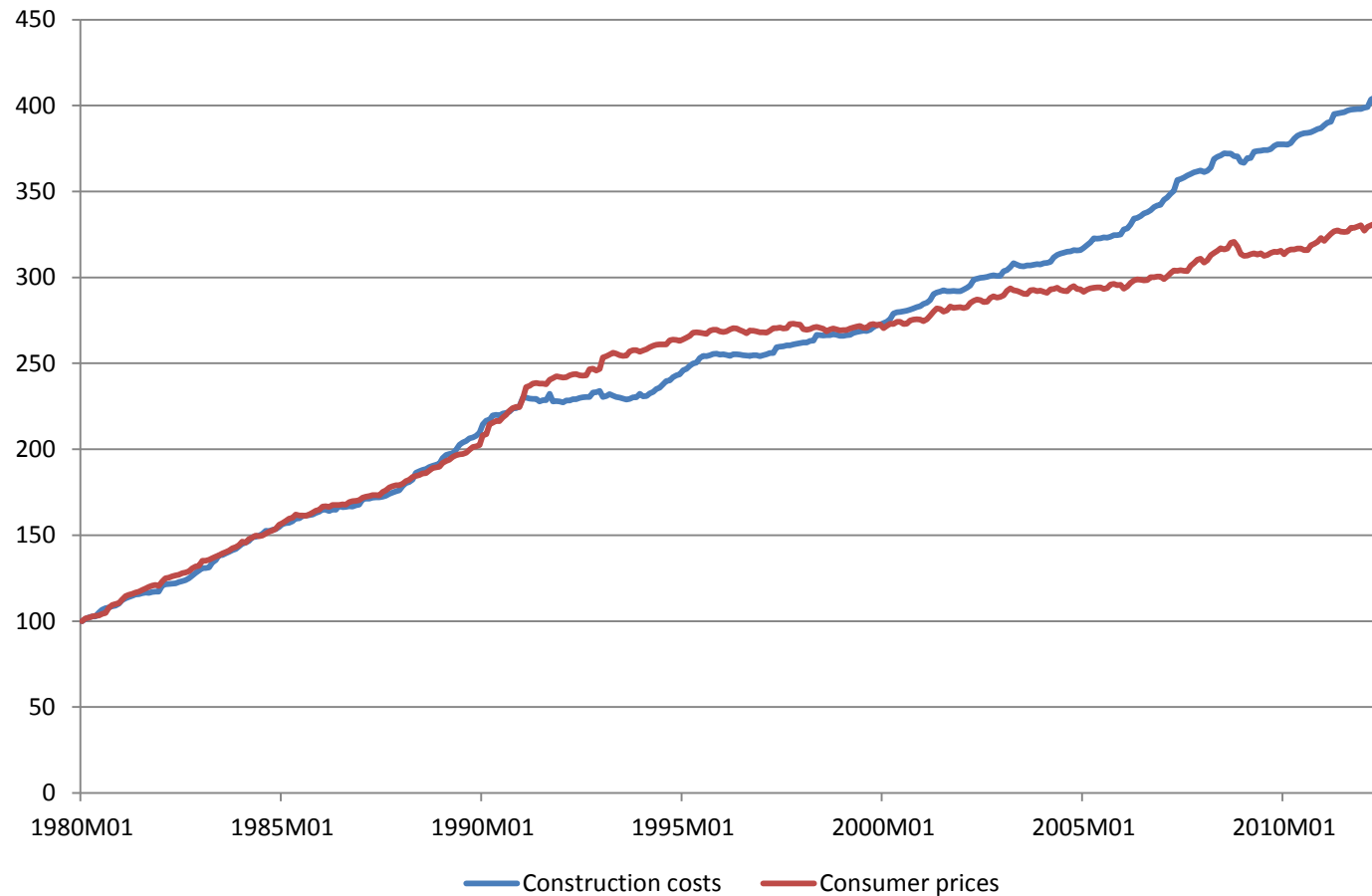
Potential reasons for a secular increase in real house prices

- Rising real land prices
- Rising real construction costs

Agricultural land prices and consumer prices in Sweden



Construction costs and consumer prices in Sweden



Theoretical priors

In the long run, we have

- A stationary user cost of housing
- A constant budget share of housing costs?

What are the assumptions needed for these priors to hold?

Some notation

ε_Y = income elasticity of housing demand

ε_R = price (user cost) elasticity of housing demand

ε_S = price elasticity of housing supply

B = budget share of housing

P = real house price

Implications of simple housing market model (when user costs are stationary)

Scenario 1 $\varepsilon_Y = \varepsilon_R = 1$ (Brusewitz (1998)) and $\varepsilon_S < \infty \rightarrow dB = 0$ and $dP > 0$

Scenario 2 $1 > \varepsilon_Y > \varepsilon_R$ (Englund et al. (1995)) and $\varepsilon_S < \infty \rightarrow dP > 0$, sign of dB uncertain

Scenario 3 $\varepsilon_Y = 1 > \varepsilon_R$ and $\varepsilon_S < \infty \rightarrow dB > 0$ and $dP > 0$

Scenario 4 $\varepsilon_Y = 1 \geq \varepsilon_R$ and $\varepsilon_S = \infty \rightarrow dB = dP = 0$

Further implications

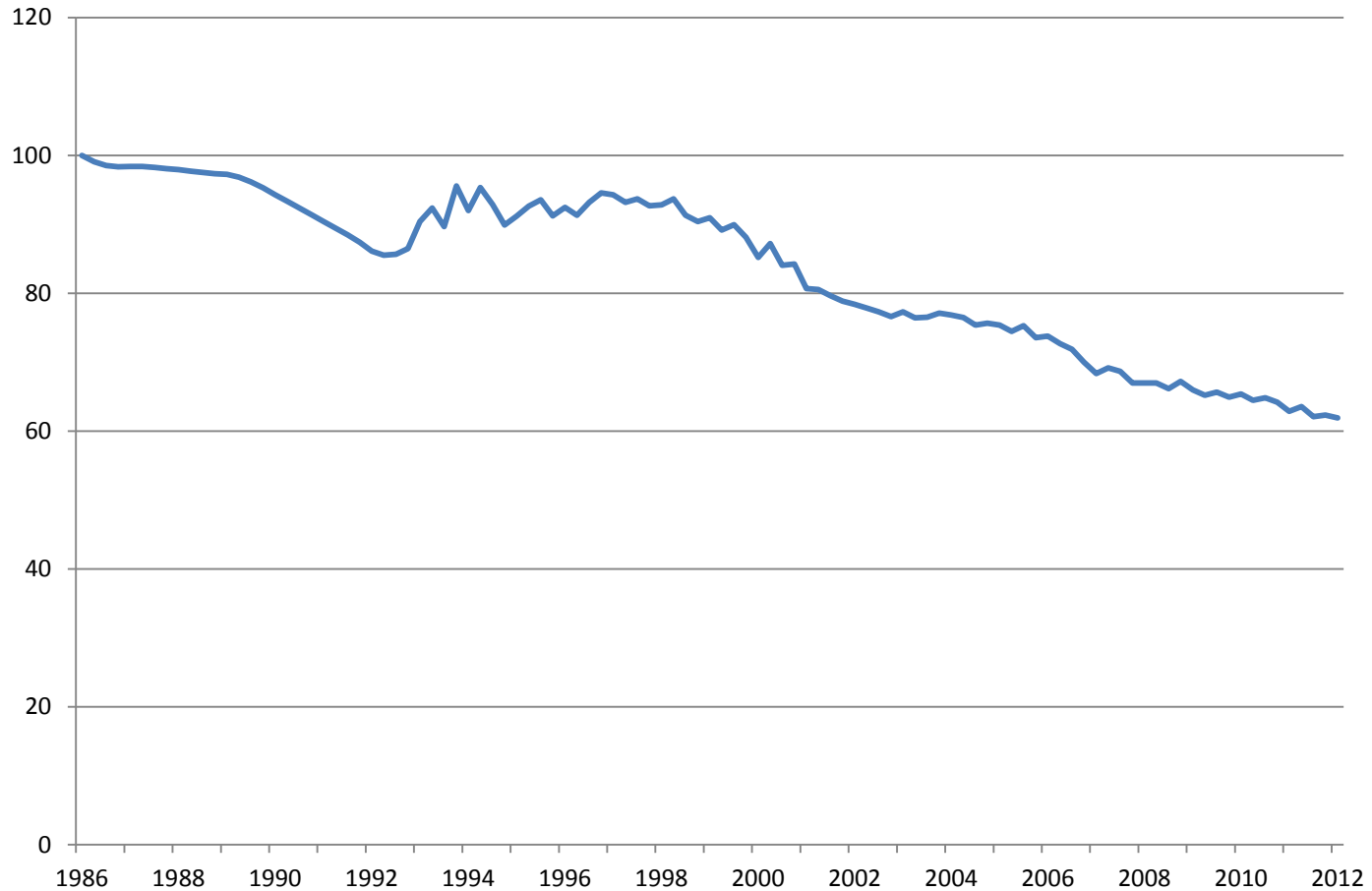
Assumptions (Scenario 1):

- Constant budget share of housing
- Stationary user cost of housing
- Secular rise in real house prices

Implication:

- The real housing stock must grow at a lower rate than real income

The ratio of the real housing stock to real disposable income in Sweden



A caveat: measurement problems

- Measured construction costs and observed house prices may partly reflect increases in the quality of housing

Implications:

- The statistics may underestimate the increase in the (quality-adjusted) housing stock
- The recorded increase in real house prices may overstate the true price increase

An econometric model of Swedish house prices

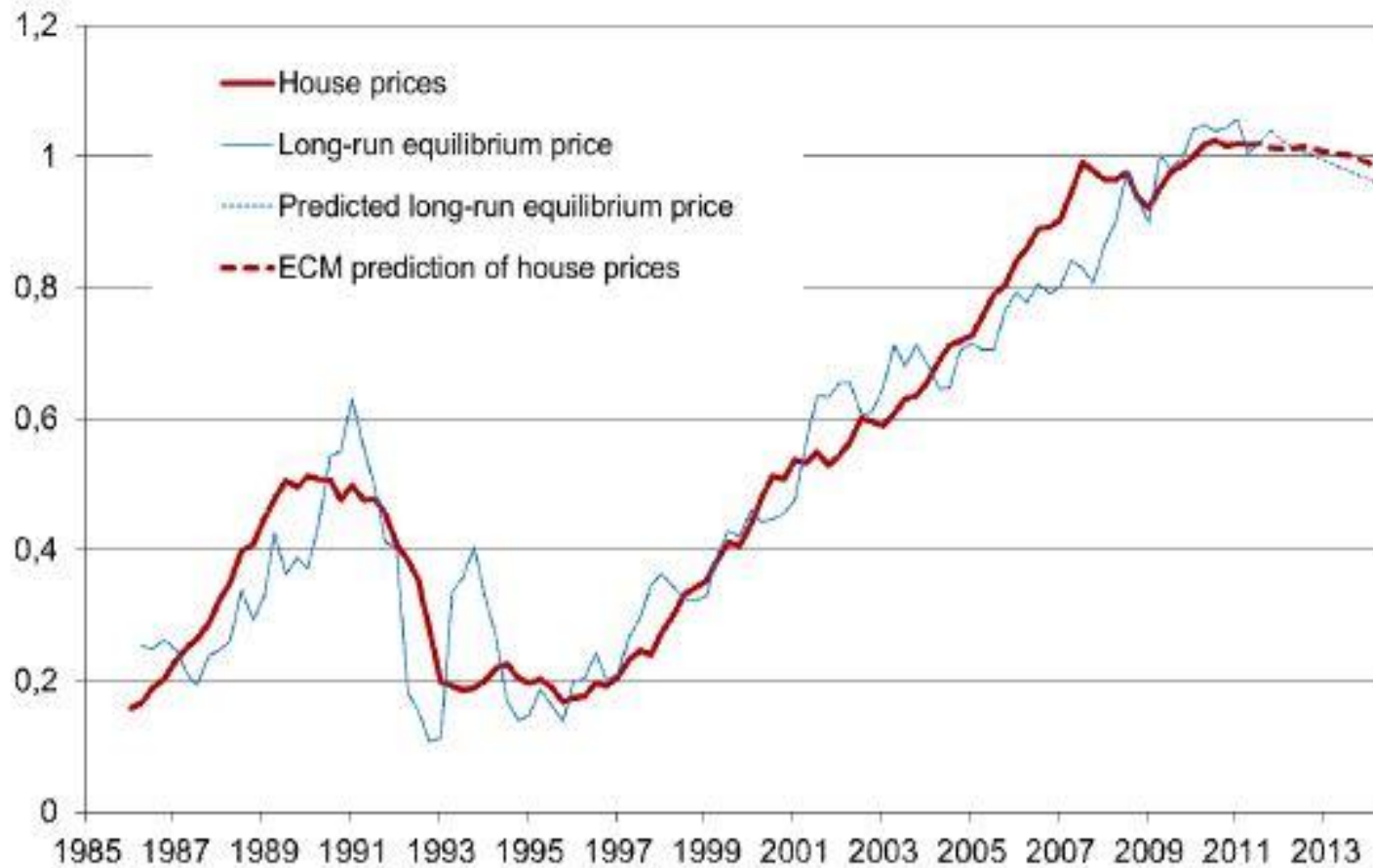
A recent model of Swedish house prices

- Claussen (2012) estimates an error-correction model of real quarterly house prices

Fraction of increase in real house prices from 1996 to 2011 that can be explained by

- Increase in real disposable income: 62%
- Fall in mortgage interest rates: 26%
- Rise in household financial wealth: 8%
- Unexplained residual: 4%

Claussen (2012): Actual and predicted real house prices in Sweden



Some worries

The Claussen model may not be well suited for forecasting, because

- The real interest rate is not treated as a stationary variable
- The equilibrium real house price is estimated to grow by 1.4% for every 1% increase in real income. Implication: The real housing stock must *fall* in the long run unless the budget share of housing costs is forever increasing

Are current Swedish house prices
out of line with rents and incomes?

Issues

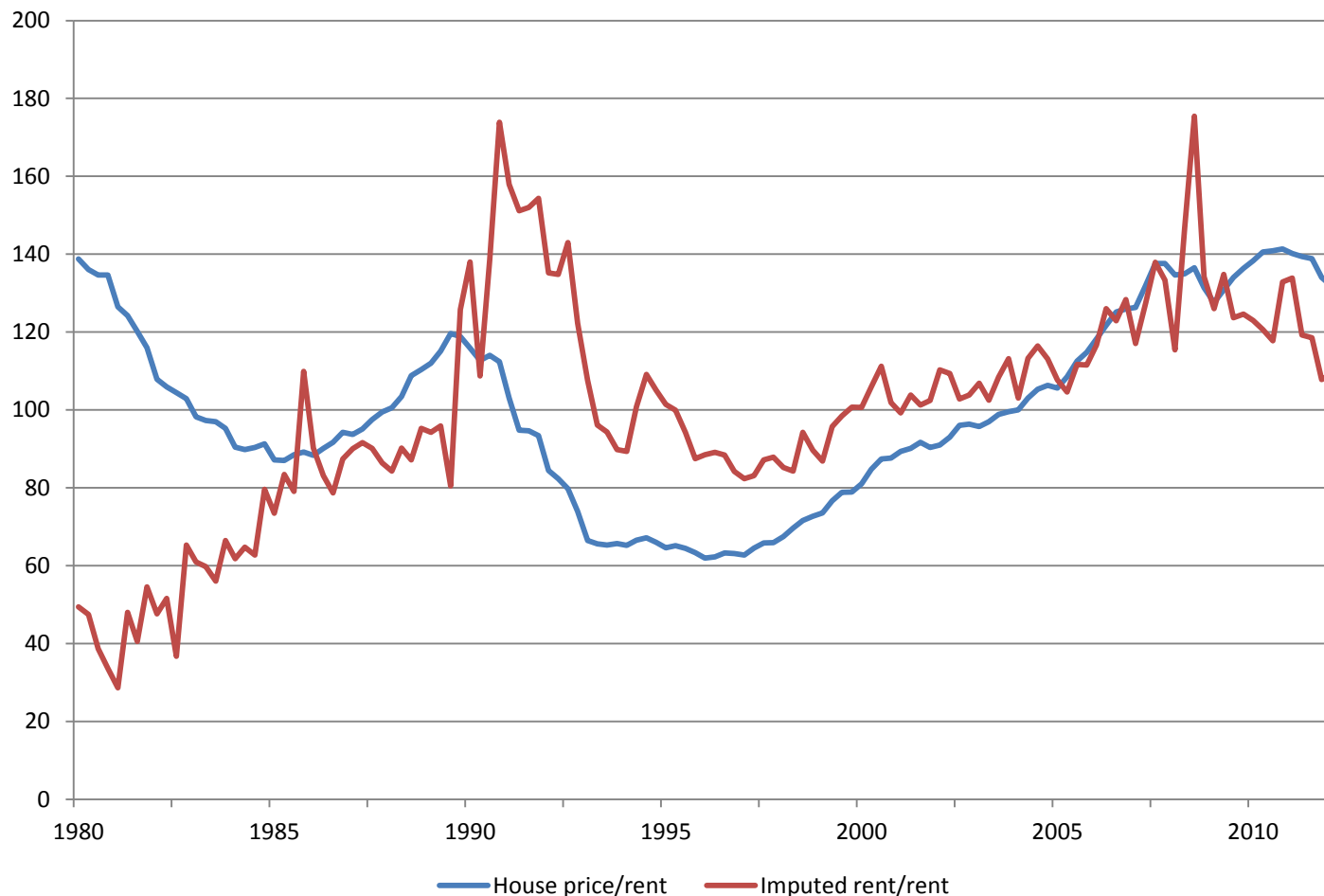
- Has owner-occupation become too expensive relative to renting?
- Has owner-occupation become too expensive relative to incomes?

The cost of owner-occupied housing

- Imputed rent = (user cost)x(real house price)
- User cost = real after-tax interest rate
 - + property tax
 - + maintenance cost
 - expected real capital gain
 - + premium for risk and credit constraints

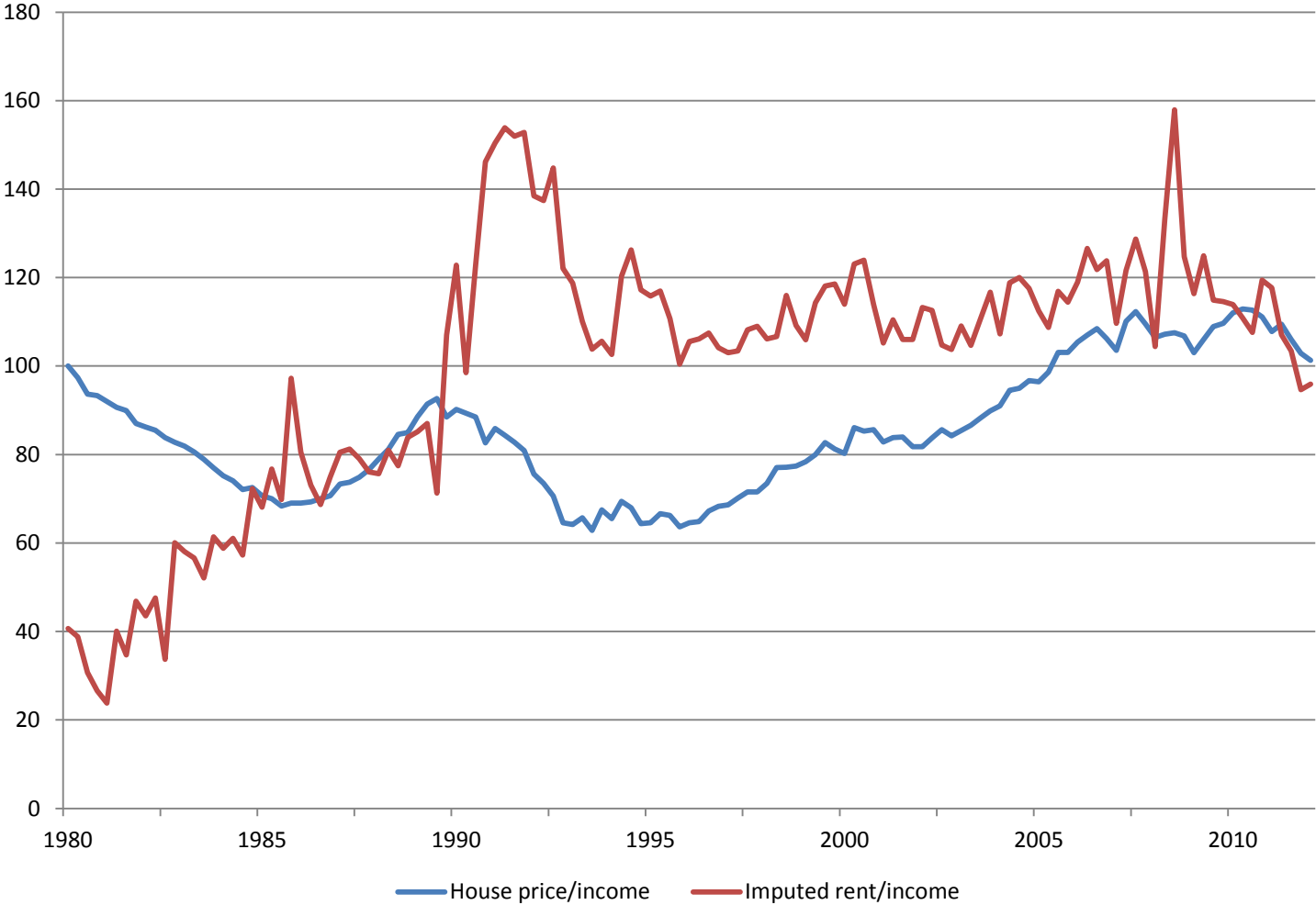
In the following, the user cost is approximated by the after-tax real 5-year mortgage interest rate plus a constant

Ratio of imputed to actual rents and ratio of house prices to rents in Sweden



Average over entire period = 100.

Ratio of imputed rent to disposable income and ratio of house prices to disposable income in Sweden



Average over entire period = 100.

Fundamental versus actual house prices in Sweden

(Background study: Bergman and Sørensen (2013))

Issues

- How do we define the "fundamental" house price?
- How have fundamental house prices in Sweden evolved?
- Do actual house prices converge on fundamental house prices?

The fundamental house price

- Starting point: Formula for imputed rent

Implication when consumers are forward-looking:

- *Fundamental house price = discounted value of rationally expected future imputed rents*

(Note: discount rate = user cost excluding expected capital gain)

“Rent” model of fundamental house price

Assumption:

- Imputed rents on owner-occupied housing are proportional to the rents paid for rental housing

Implication:

- Expected future imputed rents depend on expected future rents for rental housing

“Supply and demand (S-D)” model of fundamental house price

Assumptions:

- Imputed rents on owner-occupied housing adjust so as to equilibrate housing demand and housing supply
- Housing demand varies positively with real disposable income and negatively with imputed rents

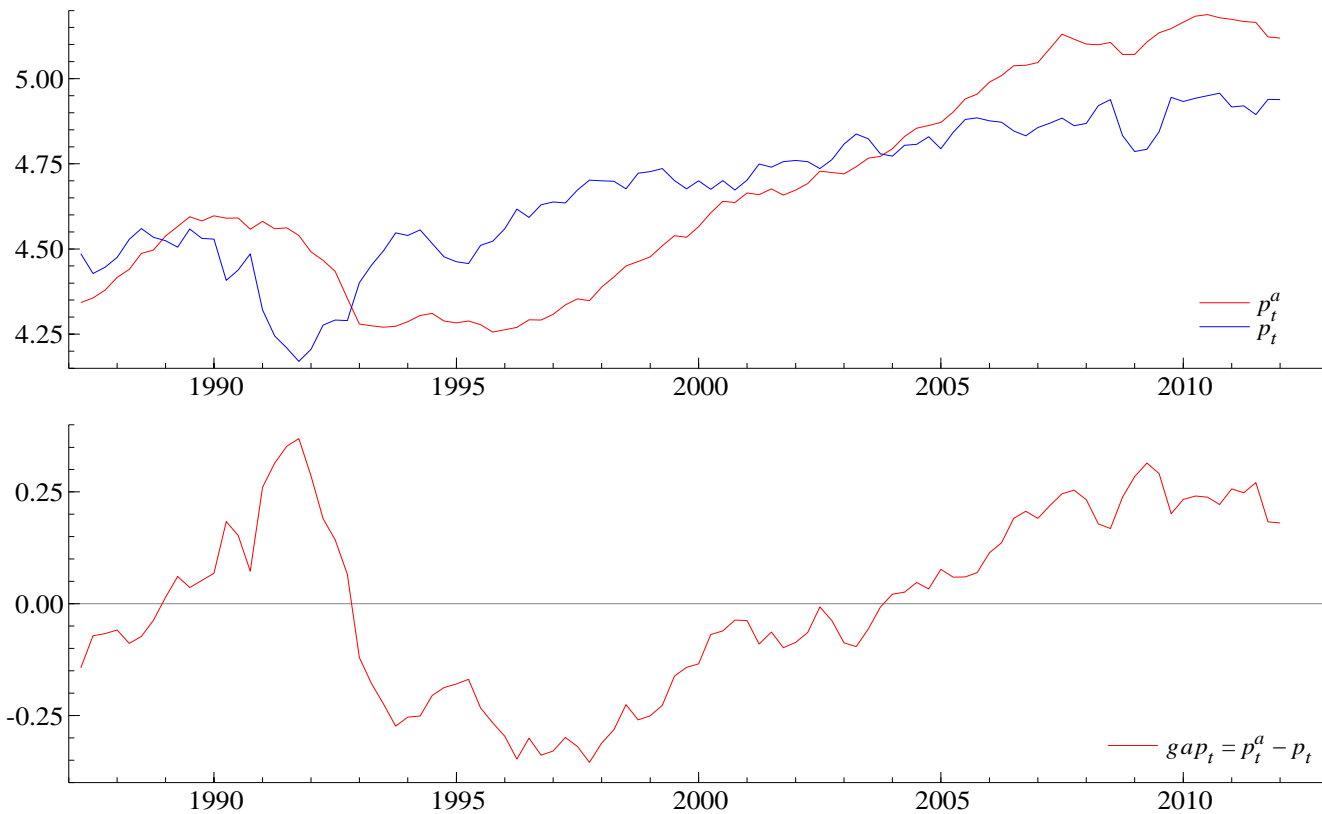
Implication:

- Expected future imputed rents depend on expected future incomes and the expected future housing stocks

Empirical implementation

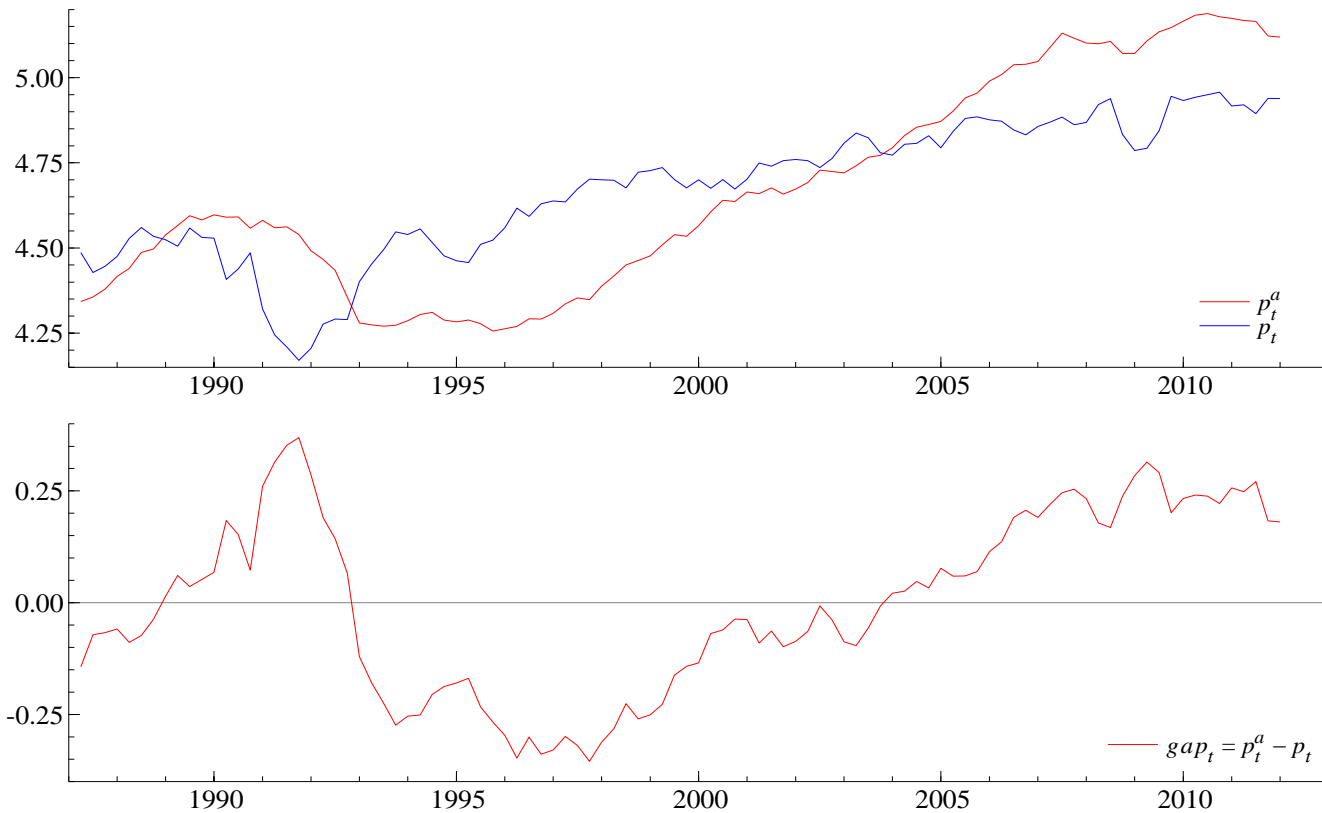
- Expectations of future imputed rents and future user costs are based on a VAR model of the historical interaction between incomes, rents, user costs, housing investment and actual house prices
- Income and price elasticities of housing demand are chosen exogenously on the basis of prior knowledge
- Estimation procedure imposes the restriction that the average levels of actual and fundamental house prices are identical over the estimation period
- Estimates are based on quarterly data for Sweden from 1986:1 to 2012:1

Actual and estimated fundamental real house prices (rent model)



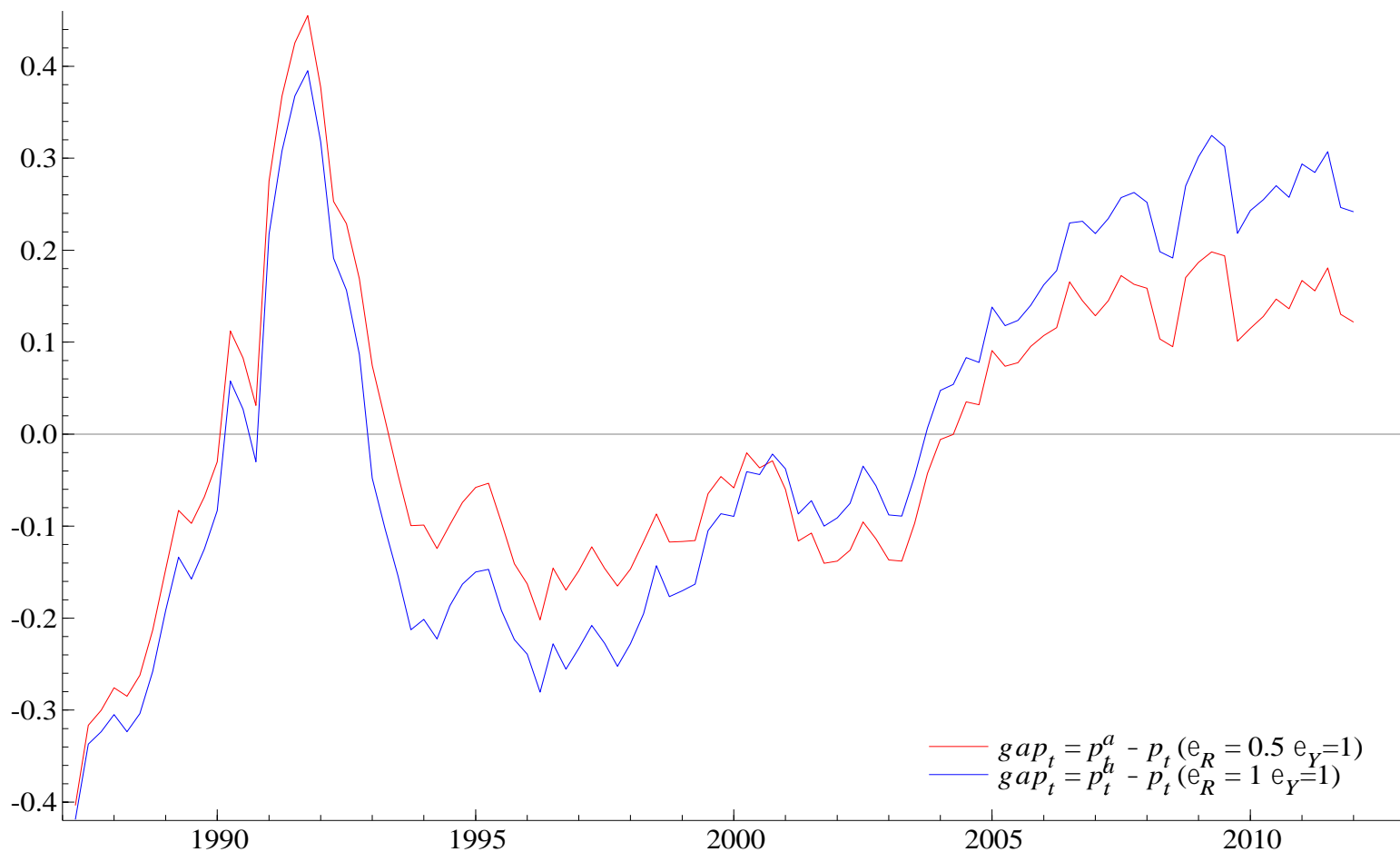
Estimated price gap 2012:1 = 18%

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

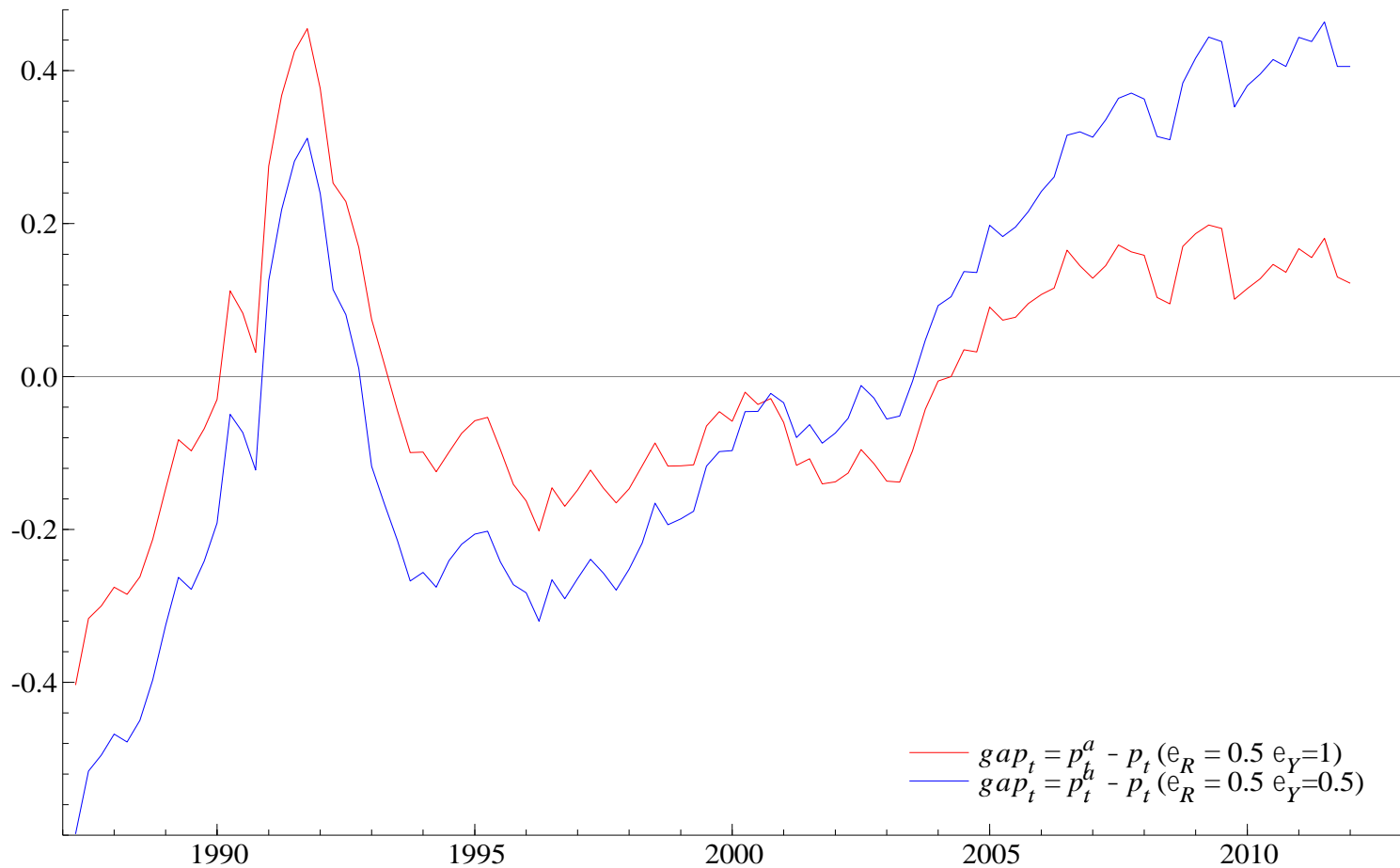


Estimated price gap 2012:1 = 12%

Sensitivity of house price gap to price elasticity of housing demand ($\epsilon_Y = 1$)



Sensitivity of house price gap to income elasticity of housing demand ($\epsilon_R = 0.5$)



House price dynamics

Hypotheses:

- Actual house prices do not affect fundamental house prices
- Fundamental house prices help to predict actual house prices
- A positive gap between actual and fundamental house prices causes a future drop in actual prices, and vice versa
- ***Findings:*** All hypotheses accepted by a Vector Error Correction model of the interaction between the actual and the estimated fundamental house prices

Estimated half-life of the house price gap (years)

	Shock to fundamental house price (permanent shock)	Shock to actual house price (transitory shock)
Rent model	3.19	9.90
S-D model with $\varepsilon_Y = 1, \varepsilon_R = 0.5$	2.21	2.97
S-D model with $\varepsilon_Y = \varepsilon_R = 1$	1.87	4.91

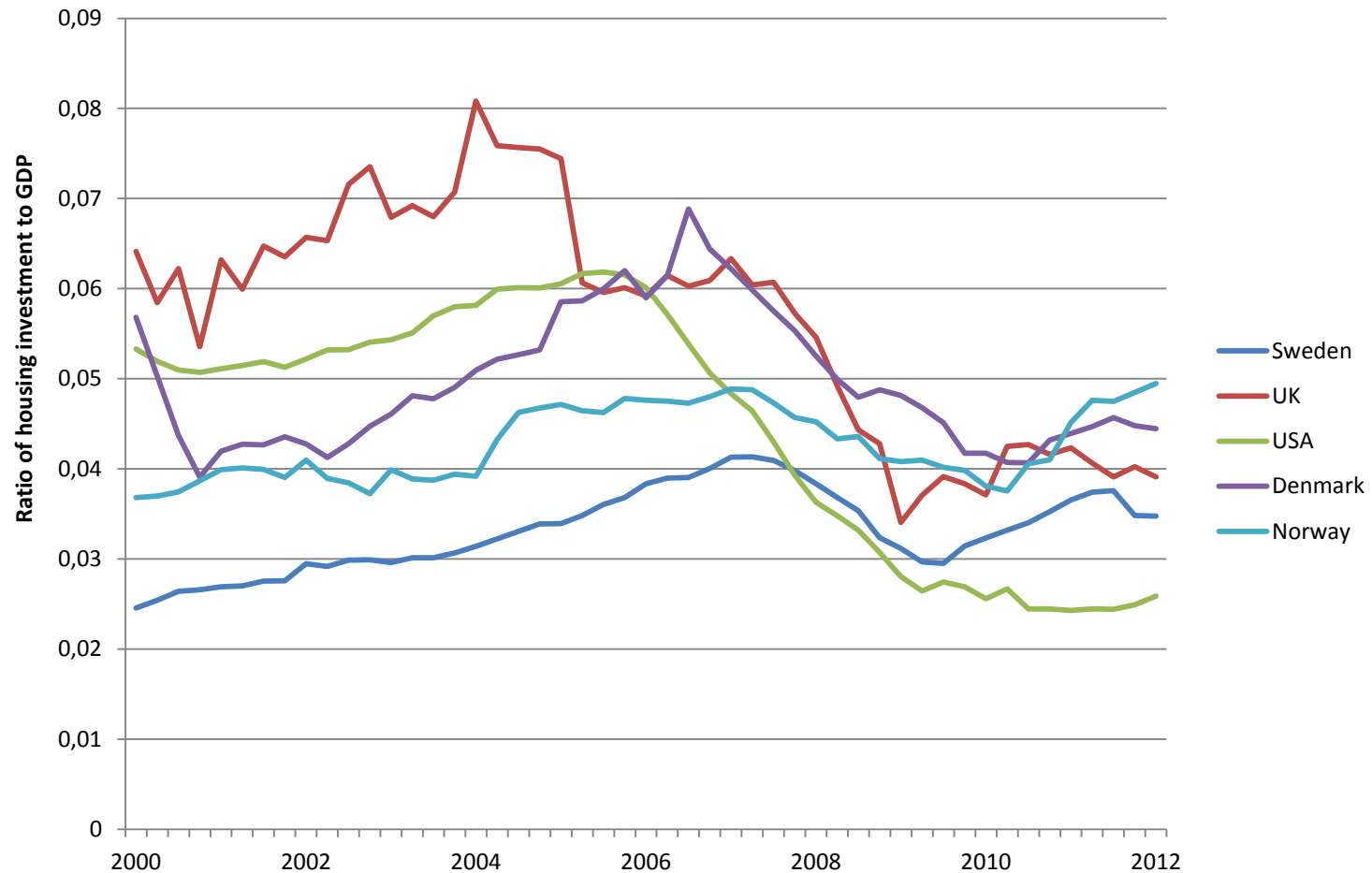
Note: The half-life is the number of years it takes before half of the house price gap is closed, following a shock to the housing market

Some other factors affecting
fundamental house prices
in Sweden

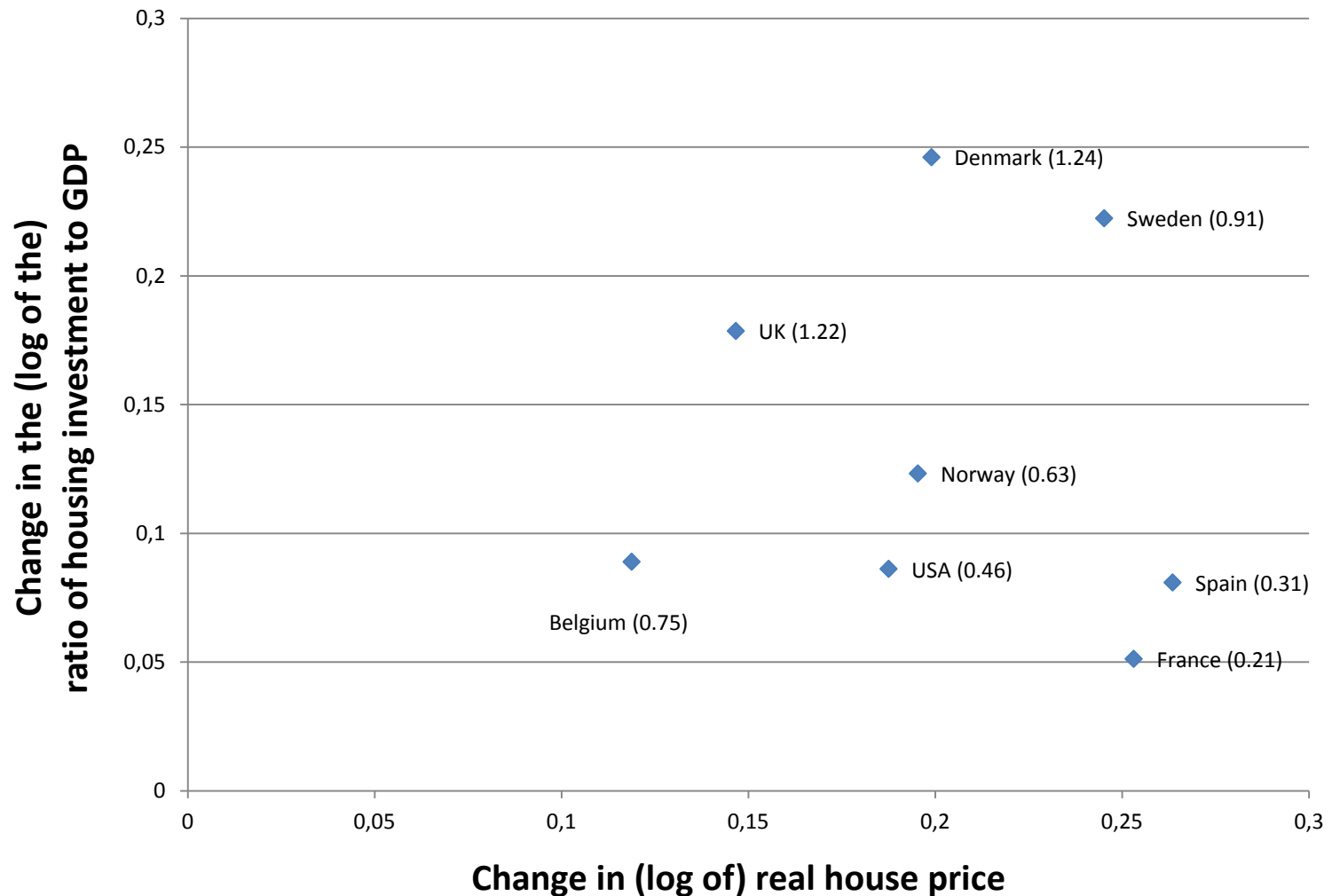
Factors that may have boosted fundamental house prices

- Financial innovations
- The recent decrease in property taxes
- Migration towards the large cities

The supply side of the housing market: Swedish housing investment is still relatively low



But Swedish construction activity has in fact responded to rising house prices



Conclusions on the supply side

- By international standards, the supply side of the Swedish housing market does not seem to be inflexible
- The relatively low ratio of housing investment to GDP may reduce the negative impact on the Swedish economy if house prices fall

Summary of main points

- A secular increase in real house prices is possible if the income and price elasticities of housing demand are both equal to one
- The most recent econometric model of Swedish house prices implies an implausibly high income effect on house prices from a long run perspective
- Current Swedish house prices seem somewhat overvalued when judged against the level of rents, but now when judged against disposable incomes

Summary of main points (ct'nd)

- Swedish real house prices appeared to be 12-18 percent above their fundamental level in early 2012
- However, this estimate does not account for the likely boost to fundamental house prices from financial innovations, property tax reductions and internal migration
- The supply side of the Swedish housing market seems to be reasonably flexible by international standards