Monetary Policy and Housing Volatility

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Introduction

- Four unfavorable macro trends in advanced economies:

  (1) secular decline in growth rates (Summers (2014))

  (2) secular decline in natural interest rates (Holston et al. (2017))

  (3) upward trend in the volatility of housing prices (NEW)

  (4) upward trend in the *volatility* of natural rates (NEW)

Introduction

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- Implications of these trends for monetary policy?

  "*Falling Natural Rates, Rising Housing Volatility and the Optimal Inflation Target*"

  with Oliver Pfäuti (University of Texas) and Timo Reinelt (ECB)

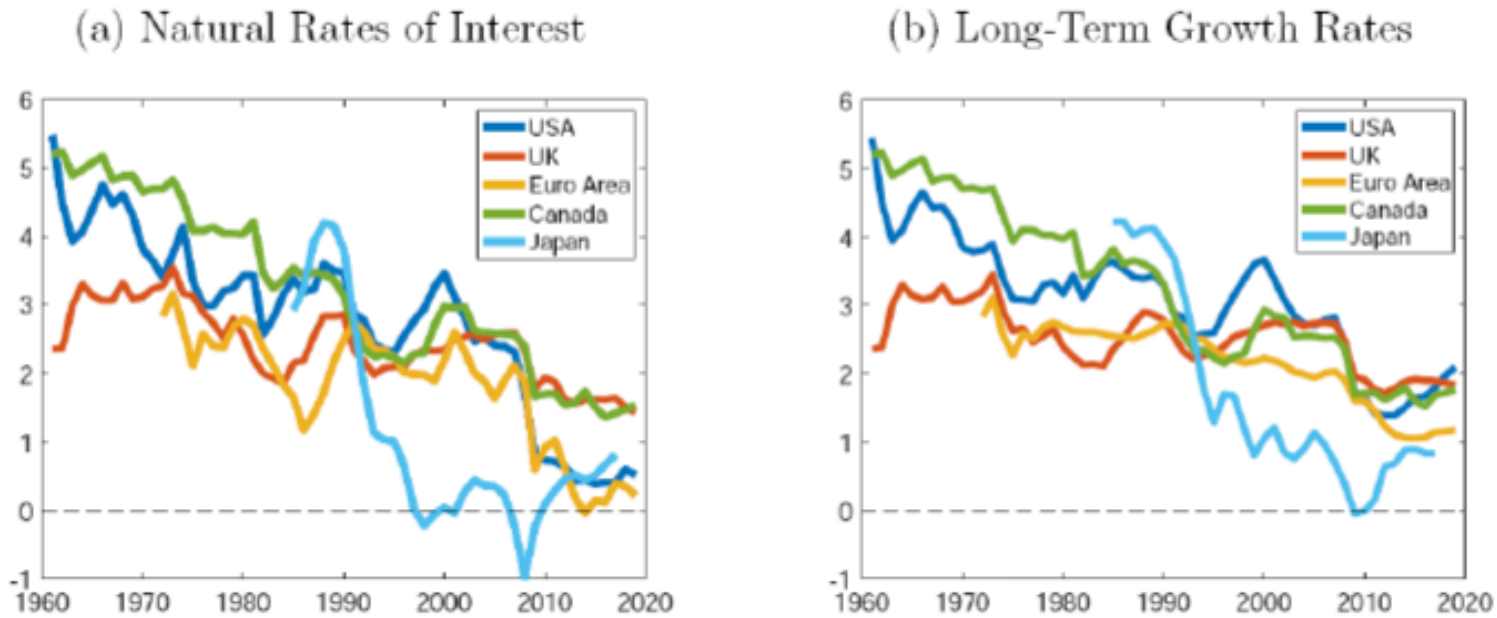
  available at: www.klaus-adam.com

Growth & interest rates trends

Chart 1

Natural Rates and Long-Term Growth Rates in Advanced Economies

(growth rates and interest rates in percentage points)



Sources: Holston et al. (2017), Fujiwara et al. (2016).

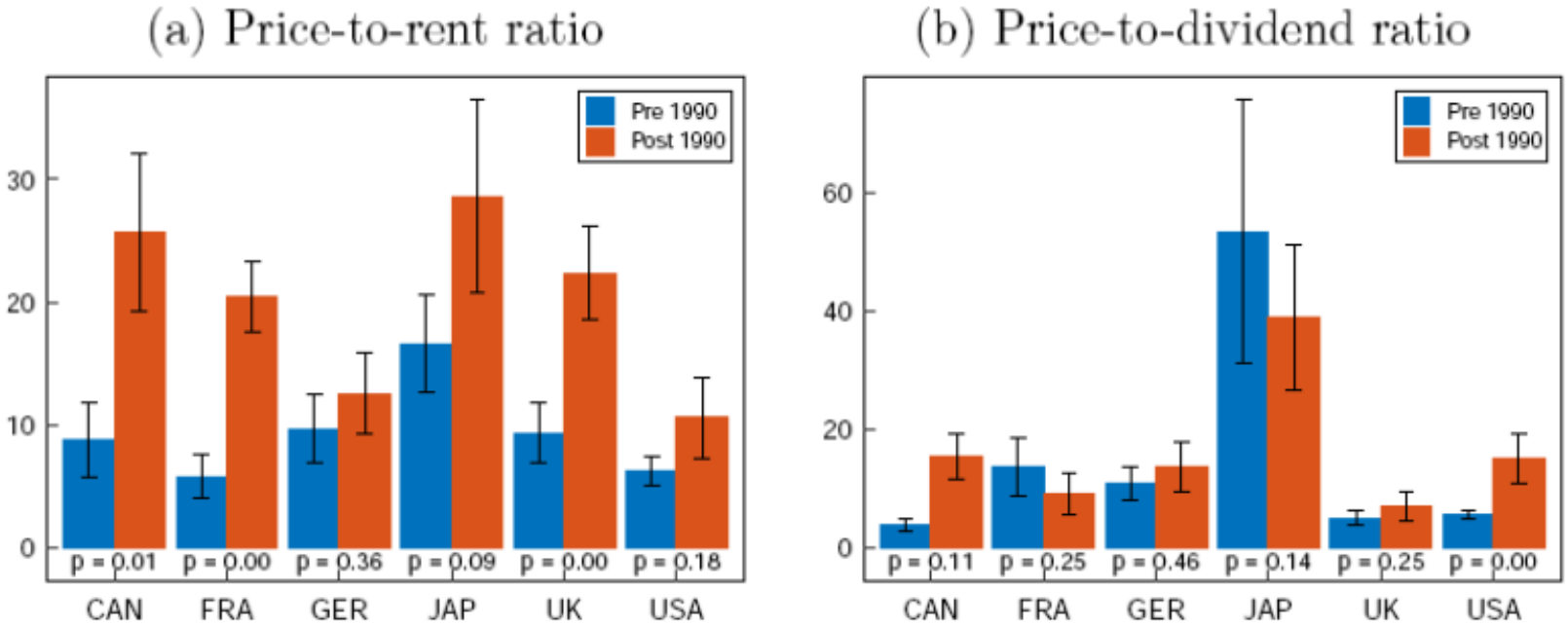
Rising Asset Price and Natural Rate Volatility

- Volatility changes at macro level difficult to measure:
  - persistent variables (price-to-rent/dividend ratios, natural rates)
  - few (independent) observations
- Must compare volatility changes over long time periods
  $\sim$1960-1990 versus 1990-2020

Rising Asset Price Volatility

Chart 2

Standard Deviation of Valuation Ratios in Housing and Stock Markets

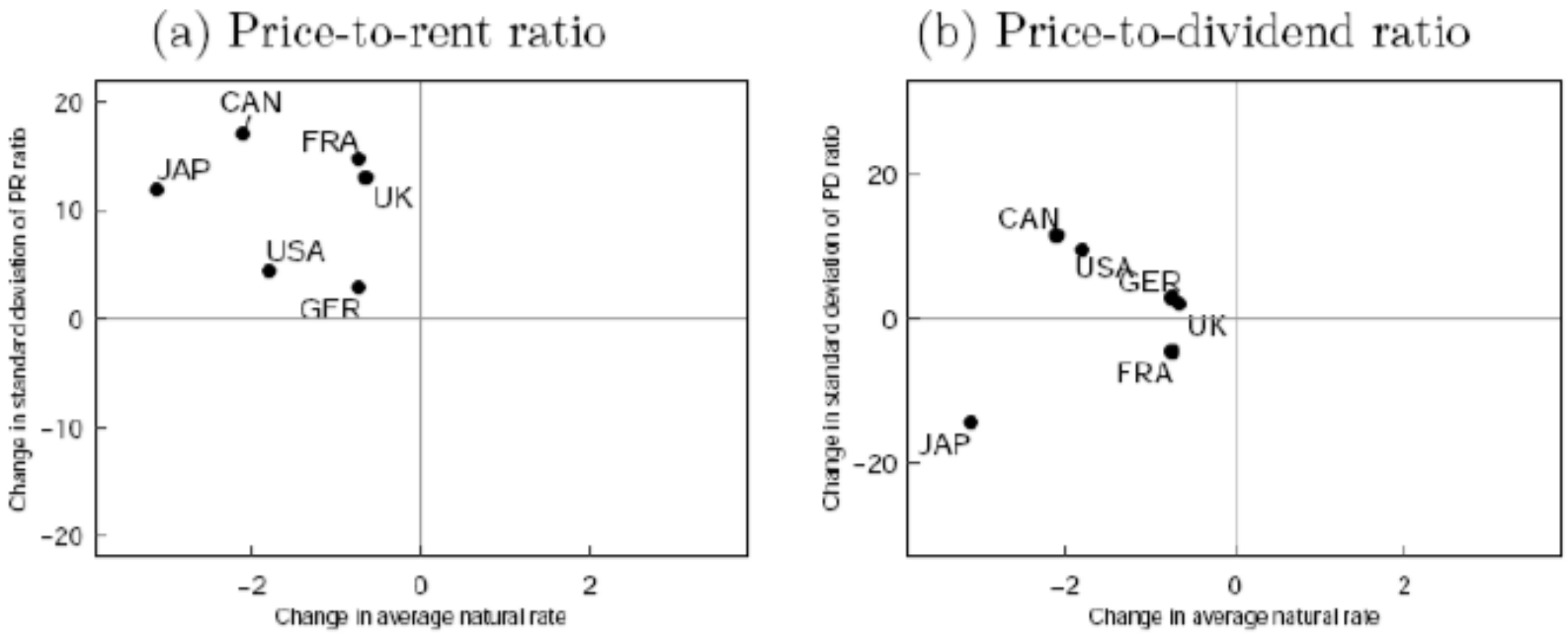


Notes: The figure reports the standard deviation of the two valuation ratios. Numbers reported at the bottom are robust p-values (Newey-West) for the null hypothesis that the standard deviations in the sub-samples are identical. Error bands indicate robust 90% confidence intervals for the estimated standard deviation. The reported numbers for the price-to-rent ratio differ from the ones in Adam, Pfaeuti and Reinelt (2020) because they compute the standard deviation in terms of percent deviation from sample mean, which leads to very similar conclusions.

Falling Natural Rates & Rising Asset Price Volatility

Chart 3

Change in Average Natural Rates vs. Change in Std. Deviation of Valuation Ratios (Pre-1990 vs. Post-1990)

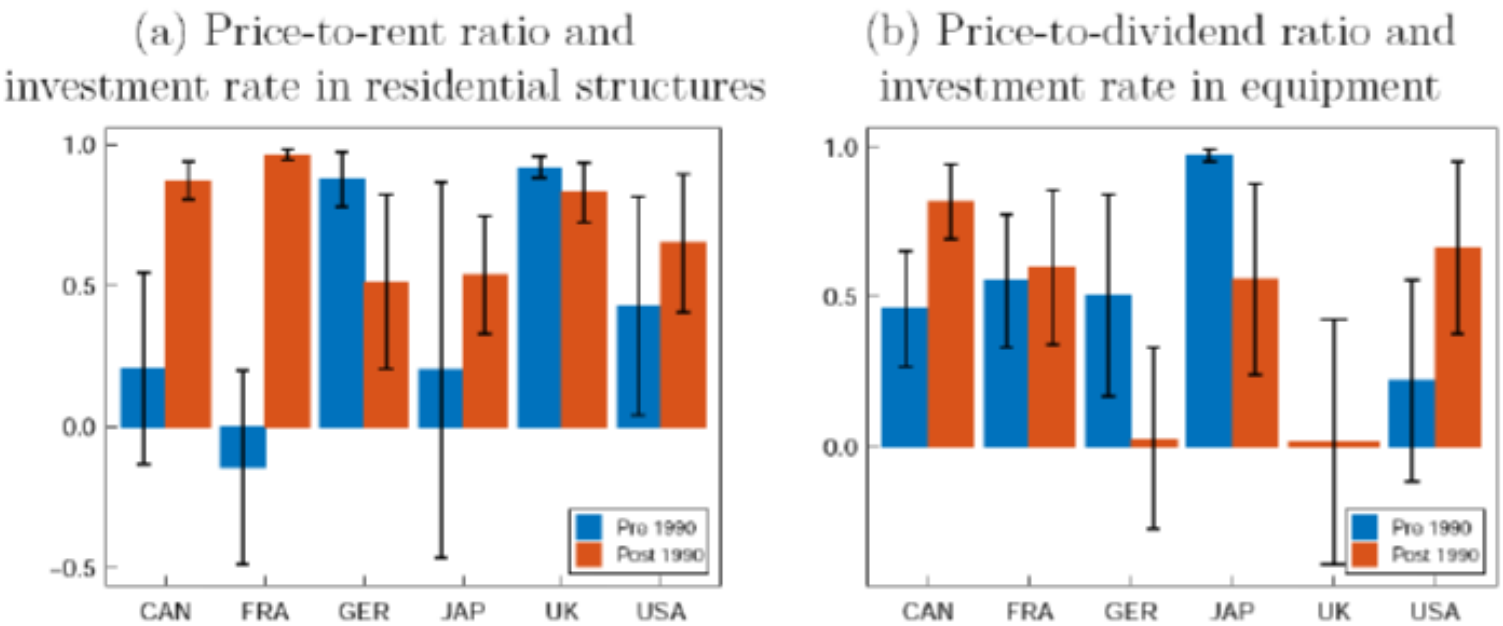


Notes: The change in the average natural rate is based on the natural rate estimates of Holston et al. (2017) and Fujiwara et al (2016). The change of the standard deviations of the PR-ratio and PD-ratio is from Chart 2.

Asset Prices & Investment

Chart 4

Correlation between Valuation Ratios and Investment Rates

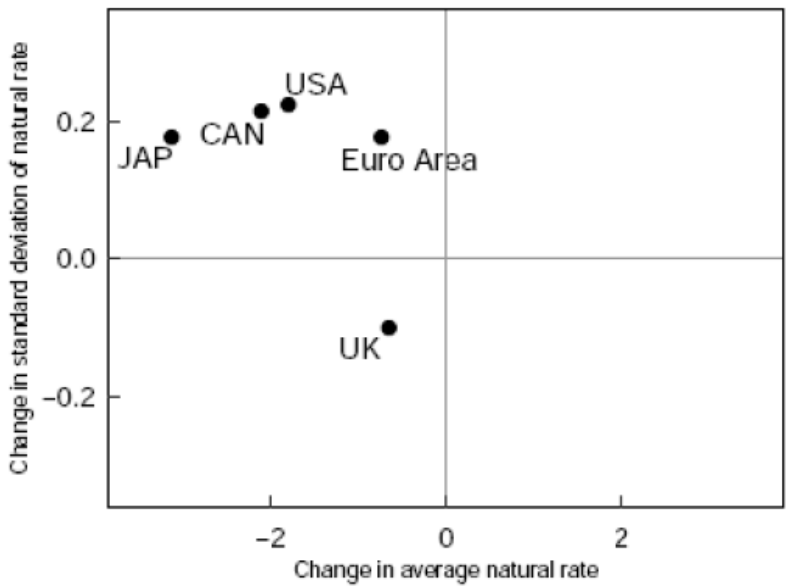


Notes: The figure reports the correlation between the valuation ratios and the linearly detrended investment-to-GDP ratios. Error bands indicate robust 90% confidence intervals (Newey-West) and have been computed using the delta-method. Panel (a) is from Adam, Pfaeuti and Reinelt (2020).

Rising Standard Deviation of the Natural Rate

Chart 5

Change in Average Natural Rate vs. Change in Std. Deviation of Natural Rate
(Pre-1990 vs. Post-1990)



Source: Adam, Pfaeuti and Reinelt (2020).
Notes: The change in the average natural rate is based on the natural rate estimates of Holston et al. (2017) and Fujiwara et al (2016). The standard deviation of the natural rate has been computed by linearly detrending the natural rate estimates.

The Big Picture

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- Can we tie all these macro trends coherently together?
- Ultimate driving force: lower long-term growth rates

  Variety of possible reasons:

  - New ideas increasingly harder to find (e.g. Bloom et al. 2020)
  - Ageing populations: risk-attitudes & creativity

  Take trend growth decline as given, when discussing mon. policy.

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- Lower growth rates $=>$ lower real interest rates
- Lower real interest rates $=>$ increased asset price volatility
- If price volatility not fully efficient (as investor surveys suggest)

  $=>$ more variable natural rate of interest
- Reason: MP needs to counteract inefficient asset price fluctuations

Outline of Remaining Talk

1. Try to convince you that asset price volatility not fully efficient
2. Implications of lower growth + higher housing volatiltiy for MP

Biases in Investor Expectations

- Consider the following two linear projections:

$$\frac{HP_{t+4}}{HP_t} = \mathbf{a} + \mathbf{c}\frac{P_{t-1}}{R_{t-1}} + \mathbf{u}_t$$

$$E_t^S\left[\frac{HP_{t+4}}{HP_t}\right] = a + c\frac{P_{t-1}}{R_{t-1}} + u_t$$

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- Belief-driven fluctuations *increase* as real interest rates fall

Biases in Investor Expectations: U.S. Housing Markets

Table 2

The Different Cyclicality of Realized and Expected Capital Gains in Housing Markets

Michigan survey, 1yr house price growth

Survey average				Survey median			
$\widehat{c}$	$\widehat{\mathbf{c}}$	bias $-E(\widehat{\mathbf{c}}-\widehat{c})$	p-value $H_0{:}c=\mathbf{c}$	$\widehat{c}$	$\widehat{\mathbf{c}}$	bias $-E(\widehat{\mathbf{c}}-\widehat{c})$	p-value $H_0{:}c=\mathbf{c}$
0.0607	-0.0462	0.0023	0.000	0.0187	-0.0462	0.0106	0.0571

Biases in Investor Expectations: U.S. Stock Markets

Table 1

The Different Cyclicality of Realized and Expected Returns/Capital Gains in Stock Markets

	Survey average				Survey median			
	$\hat{c} \cdot 10^3$	$\hat{\mathbf{c}} \cdot 10^3$	bias $\cdot 10^3$ $-E(\hat{\mathbf{c}} - \hat{c})$	p-value H_0: $c = \mathbf{c}$	$\hat{c} \cdot 10^3$	$\hat{\mathbf{c}} \cdot 10^3$	bias $\cdot 10^3$ $-E(\hat{\mathbf{c}} - \hat{c})$	p-value H_0: $c = \mathbf{c}$
Panel A. S&P 500, real returns								
UBS, >100k, 1 yr, SPF	0.58	−2.46	0.432	0.0000	0.48	−2.49	0.415	0.0000
UBS, >100k, 1 yr, Michigan	0.57	−2.46	0.452	0.0000	0.47	−2.49	0.413	0.0000
UBS, all, 1 yr, SPF	0.57	−2.46	0.424	0.0000	0.49	−2.49	0.401	0.0000
UBS, all, 1 yr, Michigan	0.56	−2.46	0.442	0.0000	0.48	−2.49	0.433	0.0000
CFO, 1 yr, SPF	0.20	−1.67	0.222	0.0011	0.25	−1.37	0.325	0.0471
CFO, 1 yr, Michigan	0.27	−1.67	0.200	0.0006	0.34	−1.37	0.313	0.0362
Panel B. Dow Jones, real price growth								
Shiller, 1 yr, SPF	0.26	−1.22	0.235	0.0011	0.24	−1.20	0.265	0.0015
Shiller, 1 yr, Michigan	0.33	−1.22	0.232	0.0006	0.31	−1.20	0.238	0.0007
Shiller, 10 yrs, SPF	4.73	−7.25	−1.367	0.0000	6.15	−7.24	−1.440	0.0000
Shiller, 10 yrs, Michigan	4.24	−7.25	−1.423	0.0000	5.65	−7.24	−1.462	0.0000

Source: Table 1A from Adam, Marcet and Beutel (2017).

Notes: The columns labeled $\hat{c}$ report the estimate of the coefficient c in equation (2). The columns labeled $\hat{c}$ report the estimate of the coefficient c in equation (2). The columns labeled bias report the small sample bias correction and the columns labeled p-value report the small sample bias-corrected p-value for the null hypothesis that c=c.The leftmost column indicates the survey sources (UBS Survey, Chief Financial Officer Survey and Robert Shiller's investor survey), the horizon of the forecast (1 year, 10 years), the way real returns have been computed (inflation expectations from the Survey of Professional Forecasters (SPF), inflation expectations from the Michigan Survey), and various wealth categories (all: all investors in the survey, >100k: only investors with more than 100k USD in financial wealth).

Monetary Policy Implications

- How do these macro trends affect the *optimal* inflation target?
- How should monetary policy deal with asset price movements?

Monetary Policy Implications: Optimal InflationTarget

- Definition of real interest rates:

$$r_t = i_t - E_t[\pi_{t+1}]$$

- Taking the average over time/expectations:

$$E[r_t] = E[i_t] - E[\pi_{t+1}]$$

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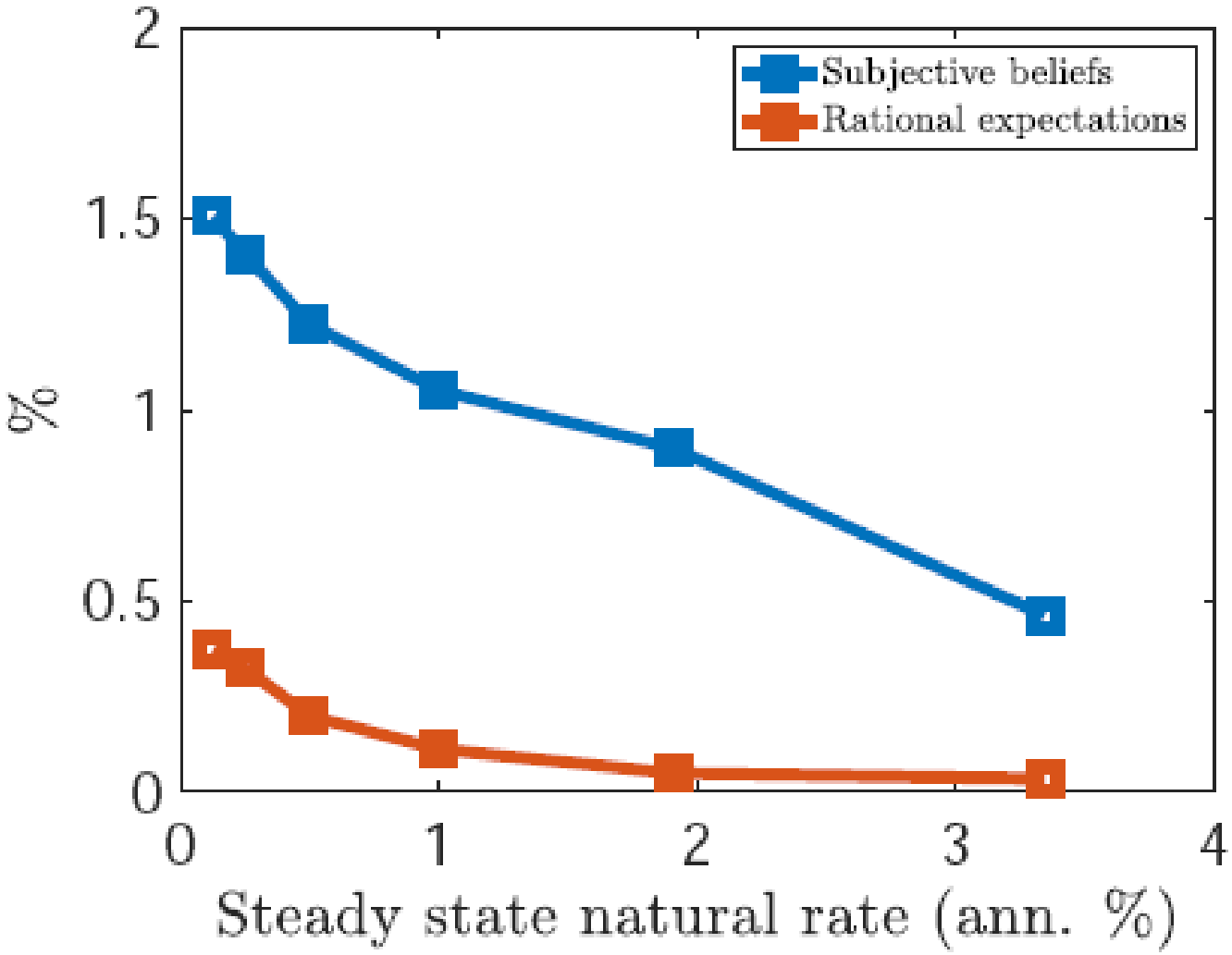
  $E[r_t]$: equal to average natural rate

- For *given* inflation target:
  Average nominal rates fall in tandem with natural rate!

Monetary Policy Implications: Optimal InflationTarget

- Lower average nominal rates: MP more often constrained by zero lower bound constraint on nominal rates!
- Effect stronger if volatility of the natural rate increases as av. natural rate falls:
  larger & more inefficient asset price fluctuations
- Optimal monetary policy response:
  If real interest rates cannot be lowered by lowering nominal rate
  $=>$ lower real rate by promising more inflation!

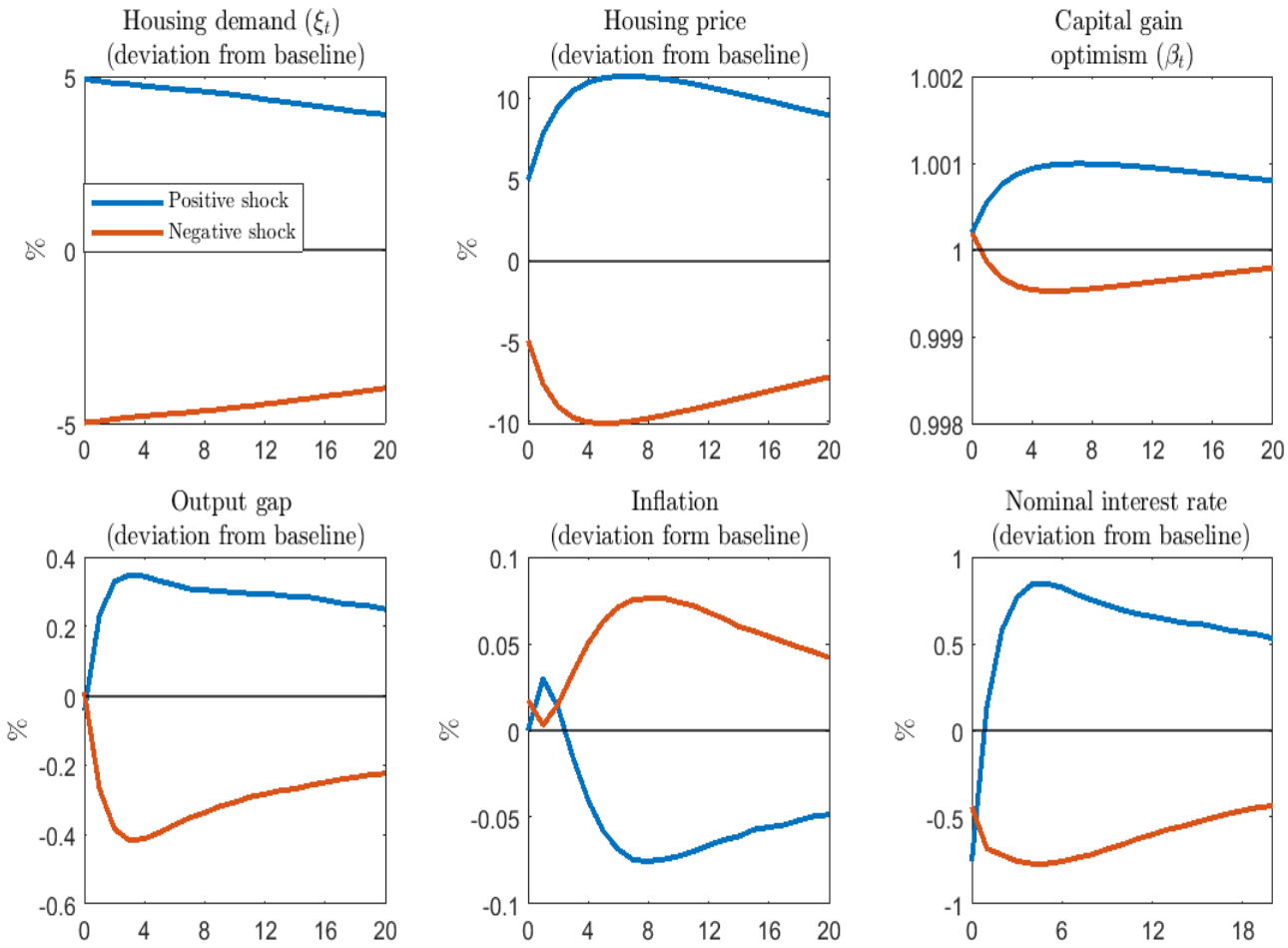
Optimal InflationTarget Increase Due to Zero Lower Bound



Monetary Policy Response to Asset Prices

- Belief fluctuations amplify fundamental AP fluctuations
- Asset price fluctuations have real effects (e.g. via investment)
- Inefficient investment fluctuations:
  house price boom $=>$ oversupply of housing
- Monetary policy should lean-against asset price fluctuations: Adam & Woodford (2021), Winkler (2019), Adam, Pfaeuti & Reinelt (2023)

Optimal Policy: Leaning Against Housing Prices



Conclusions

- Unfavorable macro trends have profound implications for MP
  - lower bound on nominal rates increasingly relevant
  - optimal to increase the inflation target
  - optimal to 'lean against' asset price fluctuations

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  - lower bound on nominal rates increasingly relevant
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  - optimal to 'lean against' asset price fluctuations
- Reversing unfavorable macro trends: boost long-term growth trend

Std. Deviation of the Price-to-Rent Ratio

(a) Standard Deviation of the Price-to-Rent Ratios for Different Sample Splits.