

Monetary Policy and the Housing Bubble

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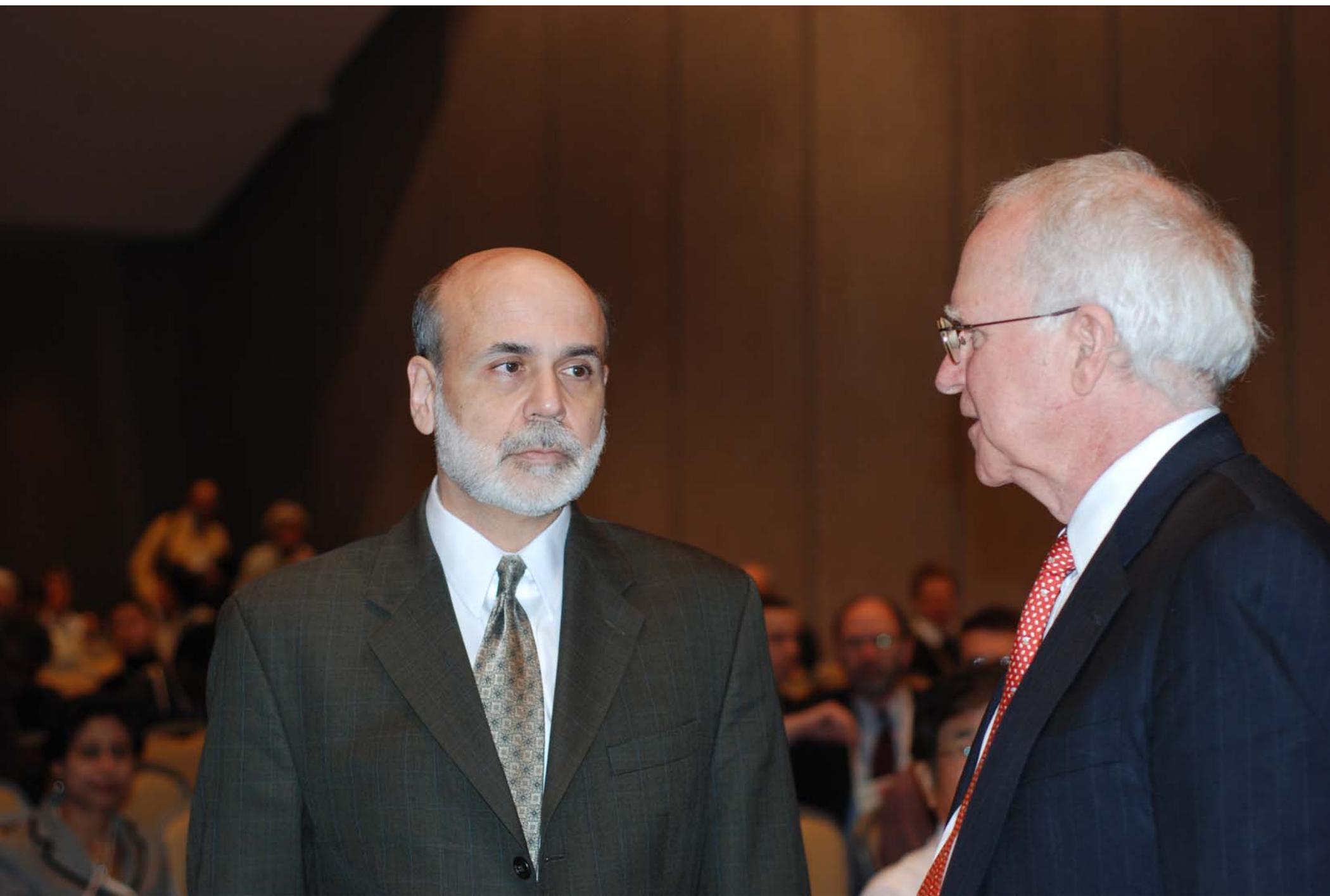
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This discussion represents the views of the author(s) and should not be interpreted as reflecting those of the Board of Governors of the Federal Reserve System or any other person associated with the Federal Reserve System.





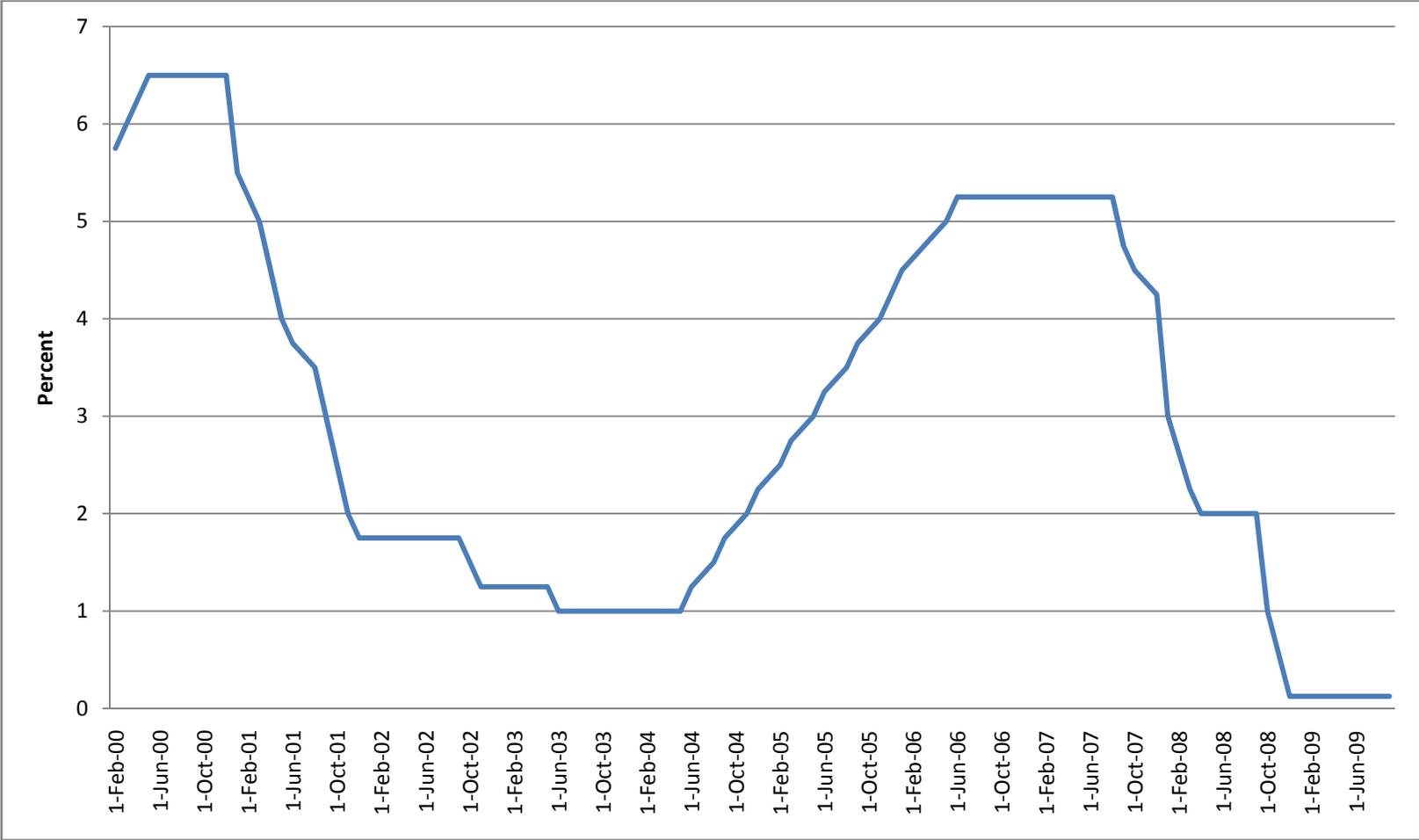
Plan for today/outline of paper

1. A Review of Monetary Policy from 2003 through 2006
 - a. Policy rules in the U.S.
 - b. The real-time policy assessment in the U.S.
 - c. Policy rules in other countries?
 - d. Critiques of policy
2. Macro Evidence on the Contribution of Monetary Policy to the Housing Boom
 - a. Model-based evidence on the contribution of policy to the housing boom
 - i. The FRB/US model
 - ii. Related macroeconomic research on U.S. developments
 - iii. A VAR model
 - b. Monetary policy and housing markets in foreign economies
3. Development in Housing Finance
 - a. International evidence on financial innovations and the housing sector
4. Lessons
 - a. Should monetary policy have leaned against the wind more forcefully?
 - b. Macroprudential regulation
 - c. Policy with multiple objectives

Key background conditions – (I) housing in the U.S.

- U.S housing market 2003-2006
 - Nominal residential investment share of GDP: averaged 4½ percent from 1974 to 2002
 - Jumped to 6¼ percent by 2005
 - House Price Bubble: prices gained 12½ percent per year, on average, over 2003-05

Figure 1: The Target Nominal Federal Funds Rate



Source: Federal Reserve Board

Key background conditions – (II) monetary policy in the U.S.

- Accommodative Monetary Policy Following the 2001 Recession
 - Federal funds rate at 1.00 percent in June 2003 – a year and a half after the recession’s end – and held there until June 2004
- Aggressive Easing in 2002 and 2003
 - “Jobless” recovery and an “unwelcome fall” in inflation
- Low policy rates were accompanied by “forward guidance.”
 - Aug. 2003: to remain accommodative for a “considerable period”
 - Jan. 2004: an intention to be “patient”
 - May 2004: accommodation to be removed at a “measured” pace
- **Was policy too easy – did monetary policy “cause” the housing bubble?**

Evaluating the Tightness or Ease of Monetary Policy

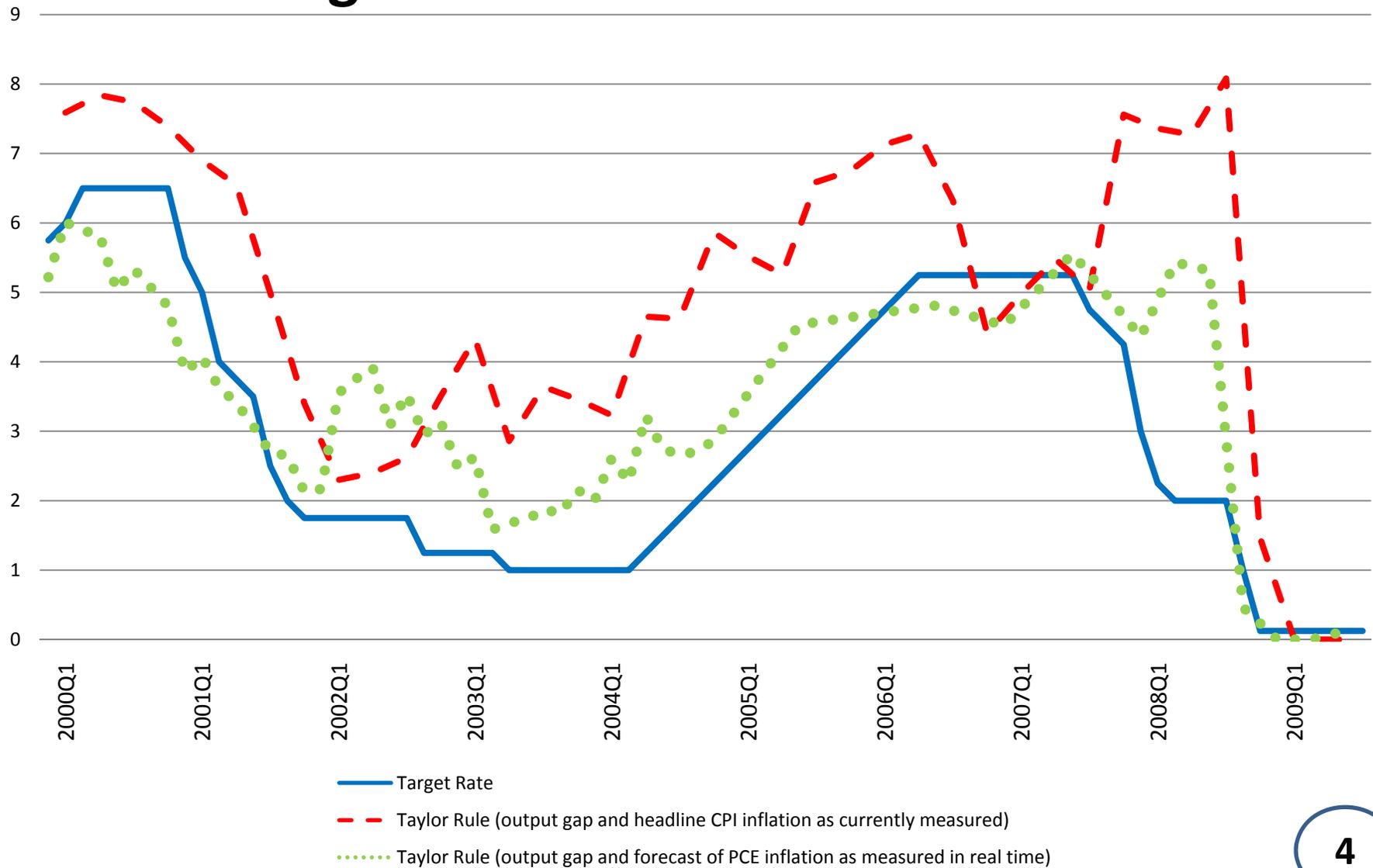
General form of the Taylor rule:

$$i_t = 2 + \pi_t + a(\pi_t - \pi^*) + b(y_t - y_t^*)$$

where

- i_t is the prescribed value of the policy interest rate in a given period t ;
- $\pi_t - \pi^*$ is the deviation of the actual inflation rate π_t from its target π^* in period t ;
- $y_t - y_t^*$, the “output gap,” is the deviation of actual real output y_t from potential output y_t^* in period t ; and
- a and b are positive numbers.

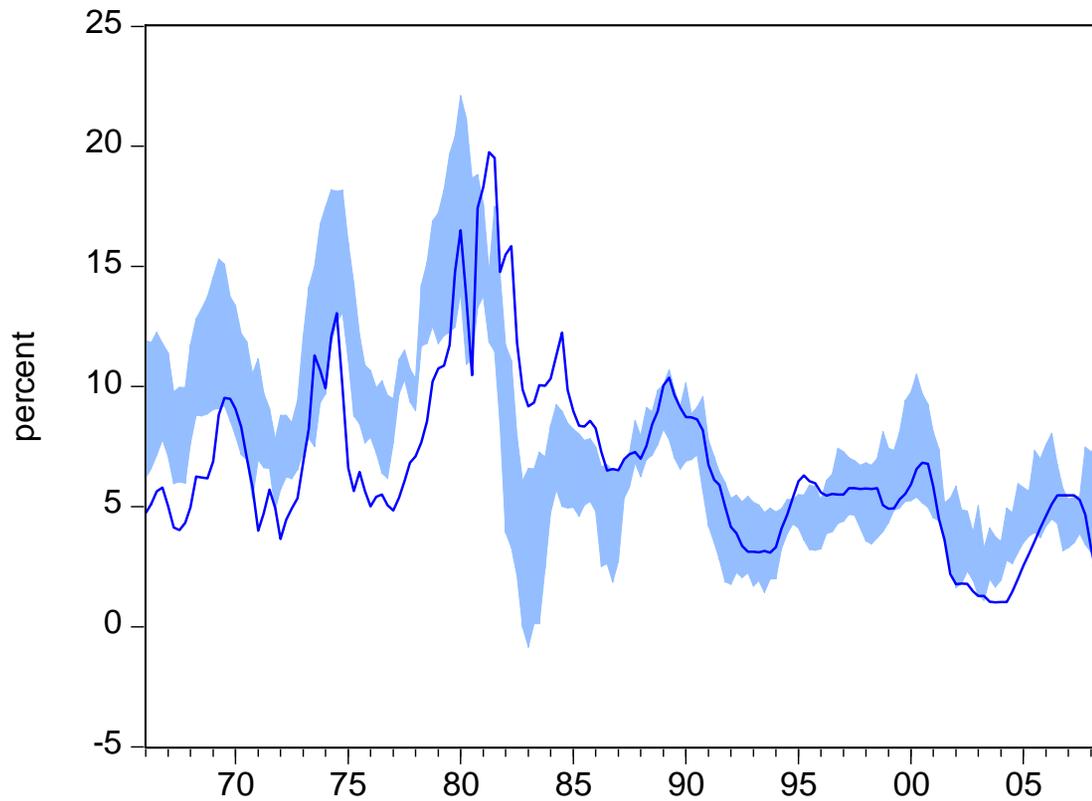
The Target Rate and the Taylor Rule Prescriptions Using Real-Time Inflation Forecasts



Source: Federal Reserve Board, Bureau of Labor Statistics, Bureau of Economic Analysis, and Federal Reserve staff calculations.

Policy rules in real time (2)

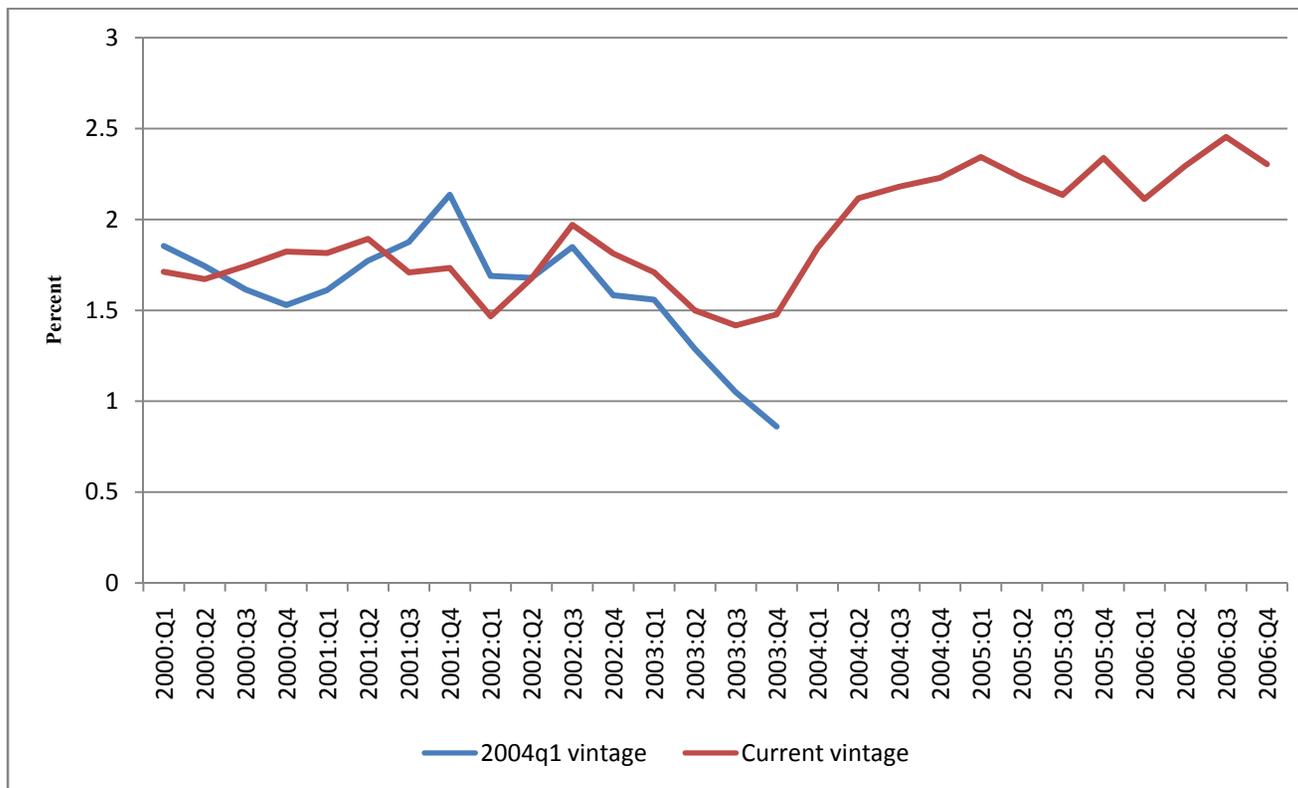
- Range of Taylor (1993, 1999) Rule Prescriptions (current and real-time data, overall and core price inflation)
- Policy was a bit loose, according to all these rule combinations – unusual?



The Real-Time Policy Discussion in the U.S. (1)

- Jobless recovery and an unwelcome fall in inflation

Real-Time and Revised Core PCE Inflation

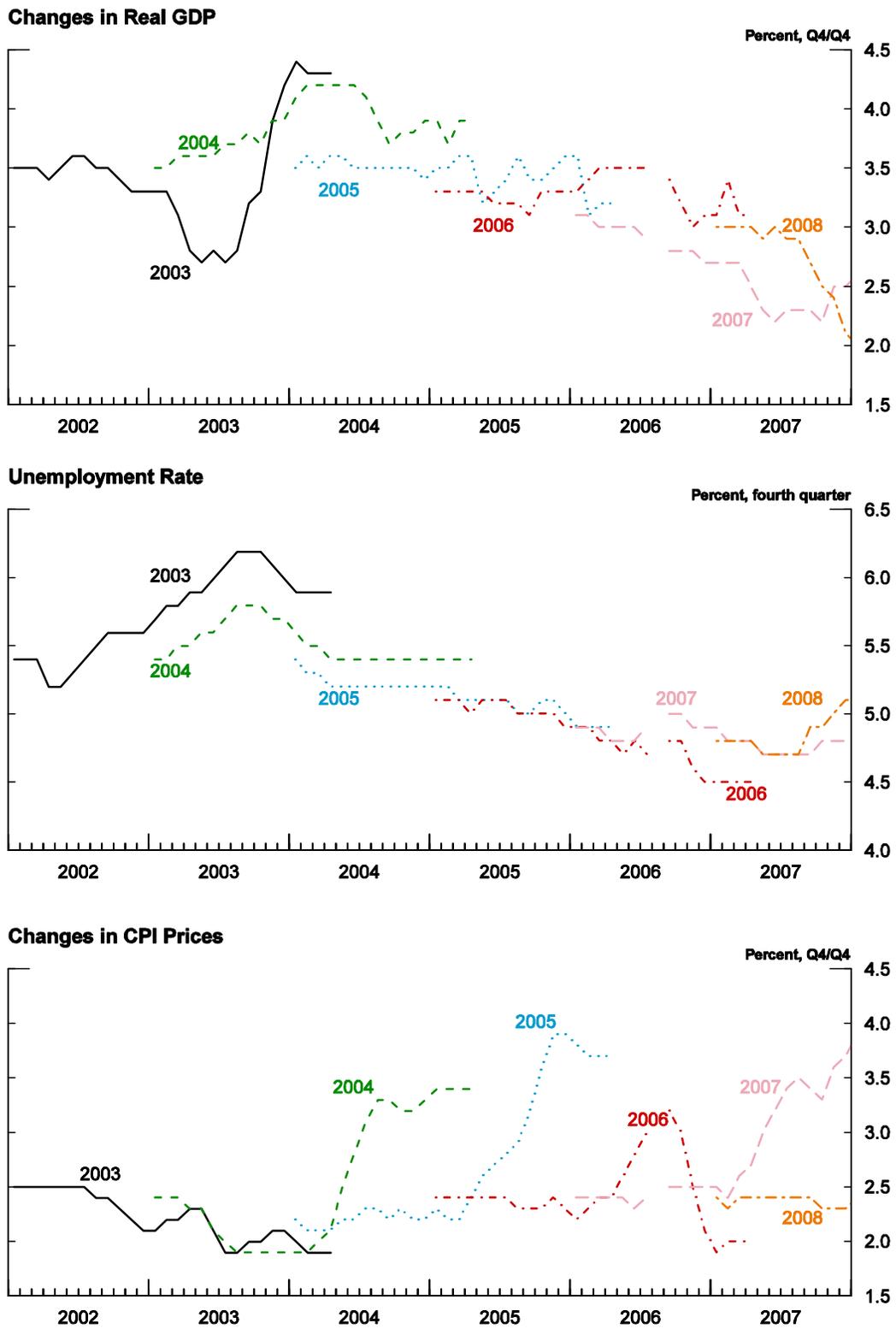


Forecasts and Outcomes of Key Macroeconomic Variables

	Blue Chip	CBO	Administration	Outcome
Year 2003				
CPI (Q4/Q4)	2.1	2.1	2.0	1.9
Unemployment rate (Q4)	5.7	5.9 ²	5.6	5.8
Year 2004				
CPI (Q4/Q4)	1.9	2.0	1.4	3.0
Unemployment rate (Q4)	5.6	5.8 ²	5.5	5.4
Year 2005				
CPI (Q4/Q4)	2.3	1.9	2.0	3.3
Unemployment rate (Q4)	5.2	5.2 ²	5.3	4.9
Year 2006				
CPI (Q4/Q4)	2.2	2.1	2.4	1.9
Unemployment rate (Q4)	4.9	5.0 ²	5.0	4.4

- Projected outcomes over this period were in line with policymakers' objectives?
- Indeed, outcomes were judged a success in real time by academics (e.g., Woodford, 2005)

Figure 6: Evolution of Forecasts from the Blue Chip Survey

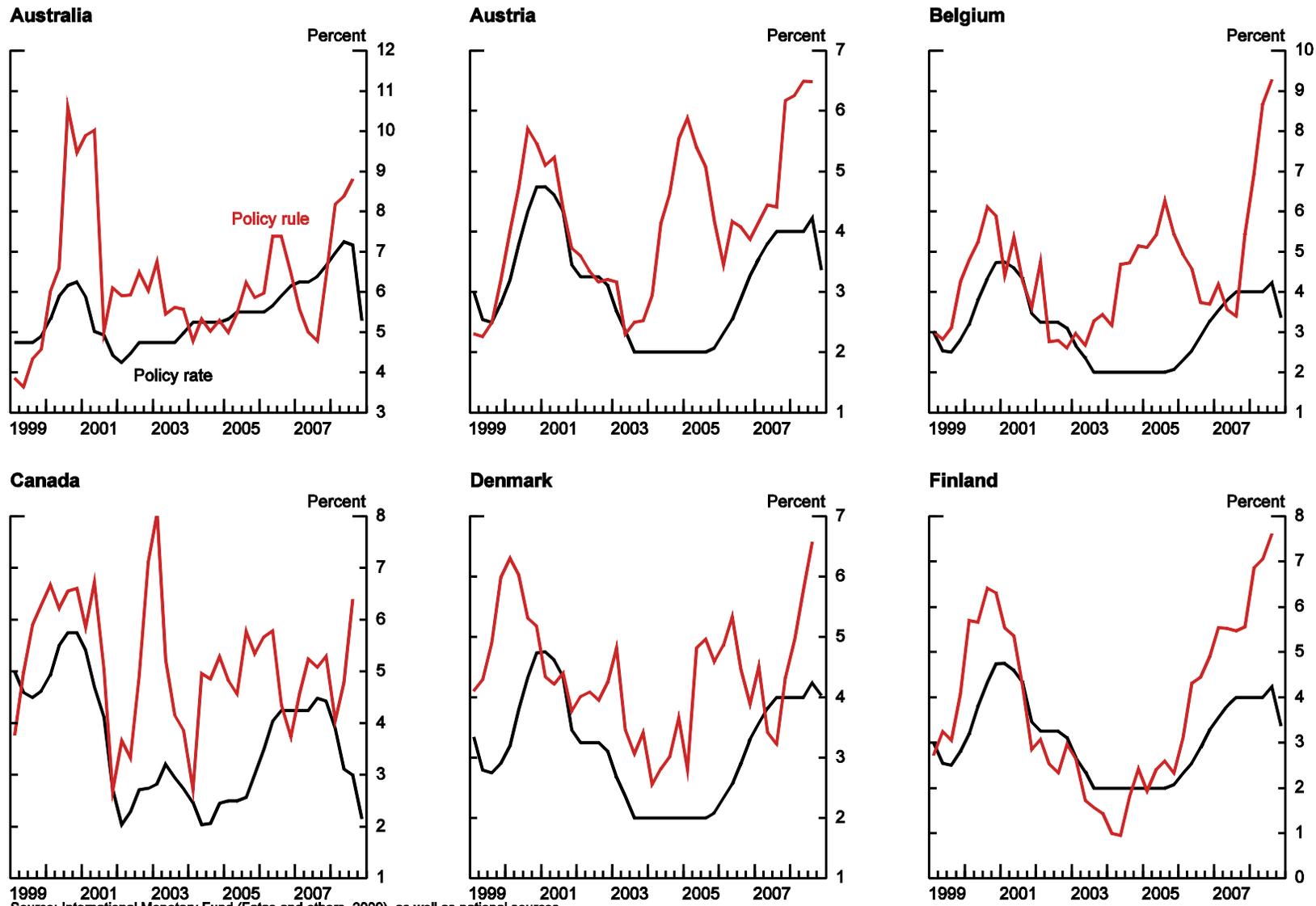


Source: Blue Chip Economic Survey, Aspen Publishers

Question: Was Monetary Policy at Foreign Central Banks “Too Loose” Relative to a Taylor Rule?

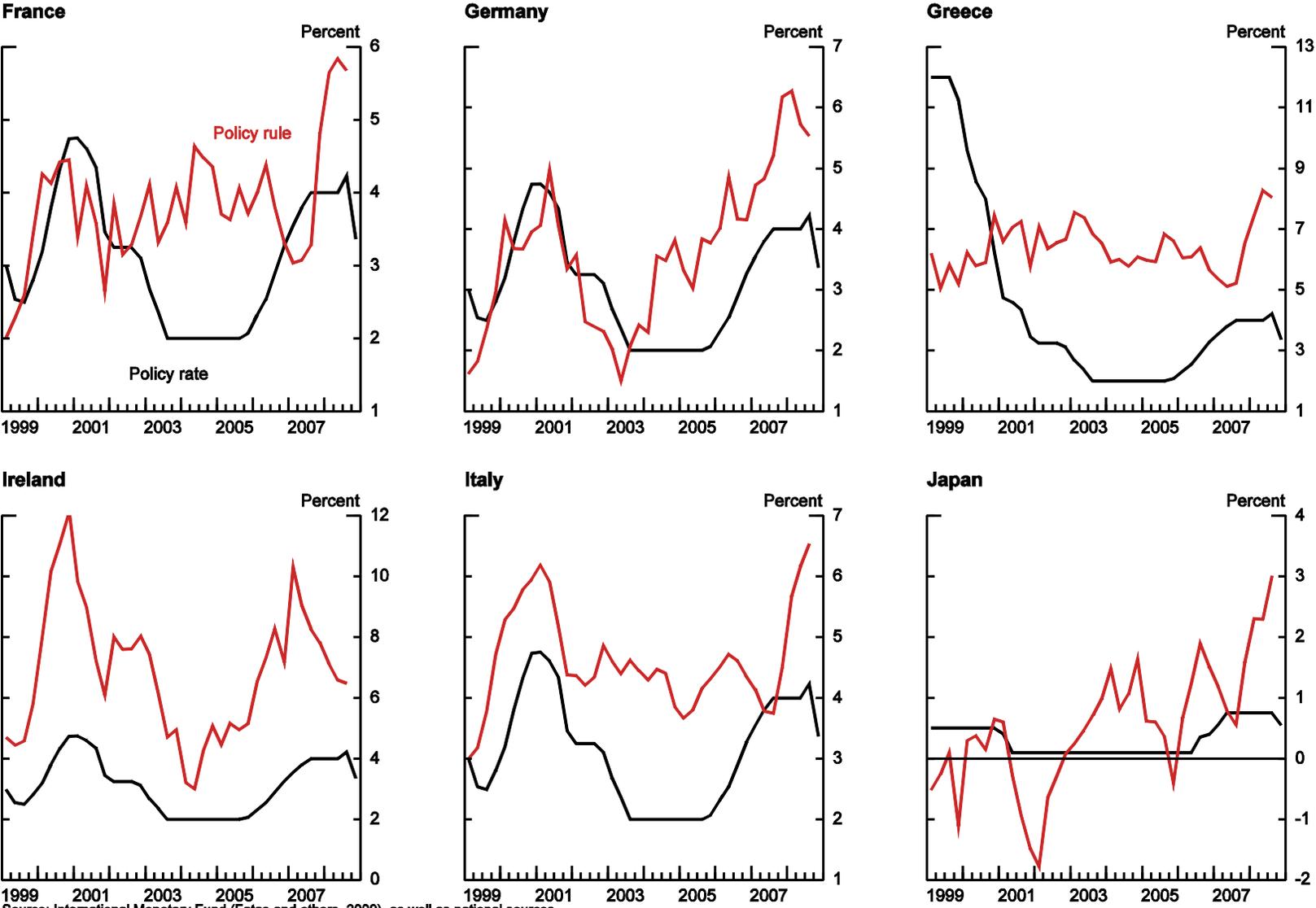
- Figure A1
 - Taylor rule policy rates (2009 WEO) in red
 - Actual policy rates
- Mostly “too loose” relative to the rule
- Two take-away points
 - Most countries not as loose as the United States
 - Some countries close to, or even at times above, the rule (despite increasing house prices)
- Interpretation
 - Taylor (2008): “following the Fed”
 - Yes, the correlation is high.
 - However, what about England and New Zealand?

Figure A1: Comparison of Policy Rates and Taylor Rules in the Advanced Foreign Economies



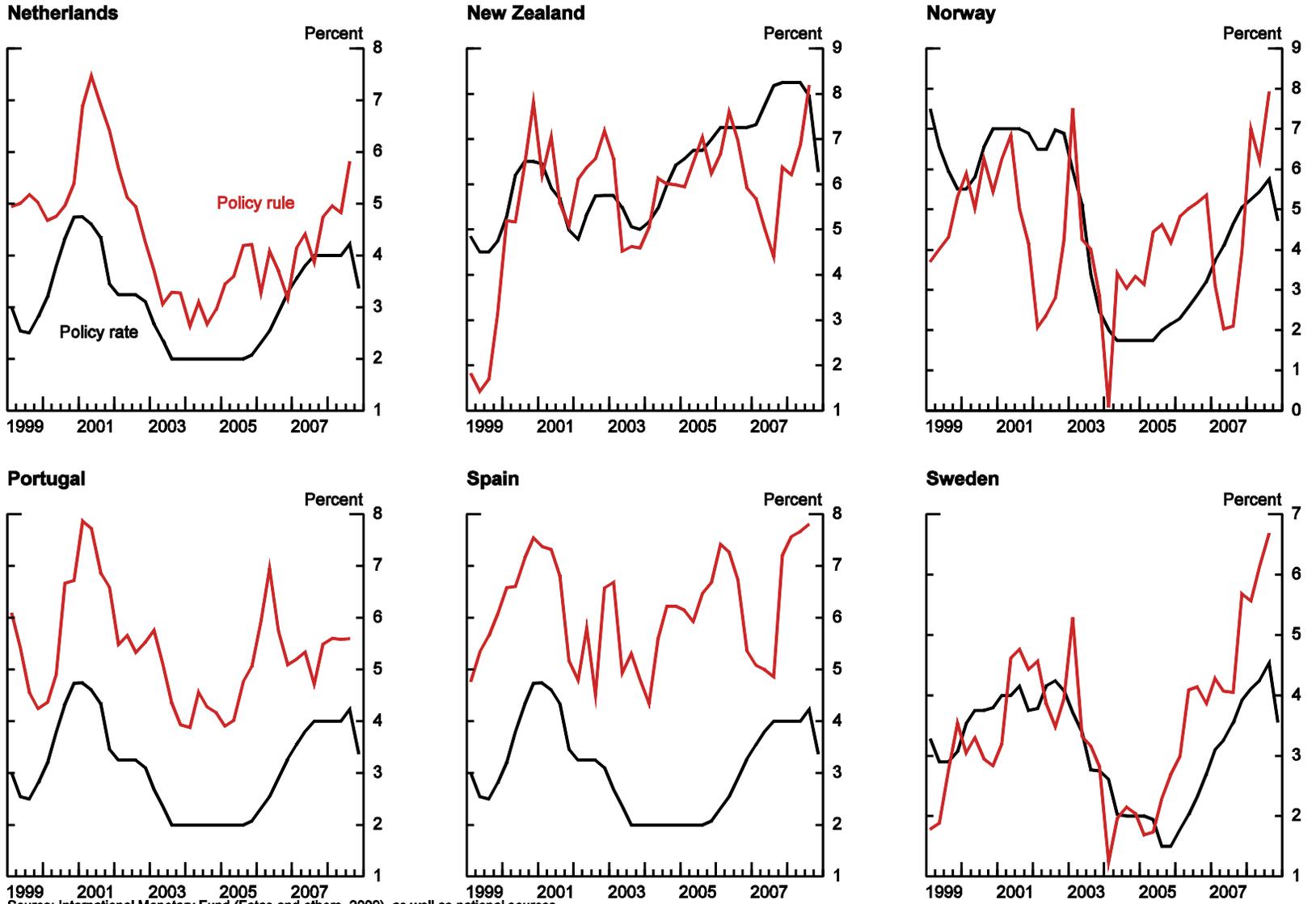
Source: International Monetary Fund (Fatas and others, 2009), as well as national sources.

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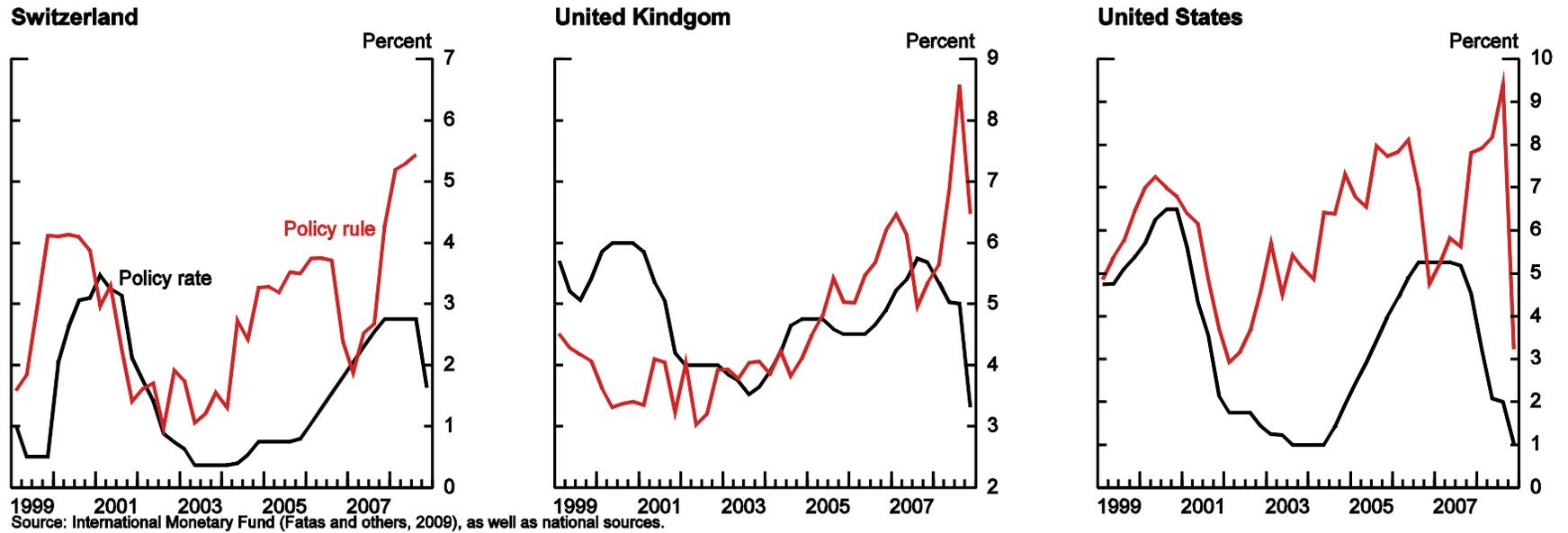
Source: International Monetary Fund (Fatas and others, 2009), as well as national sources.

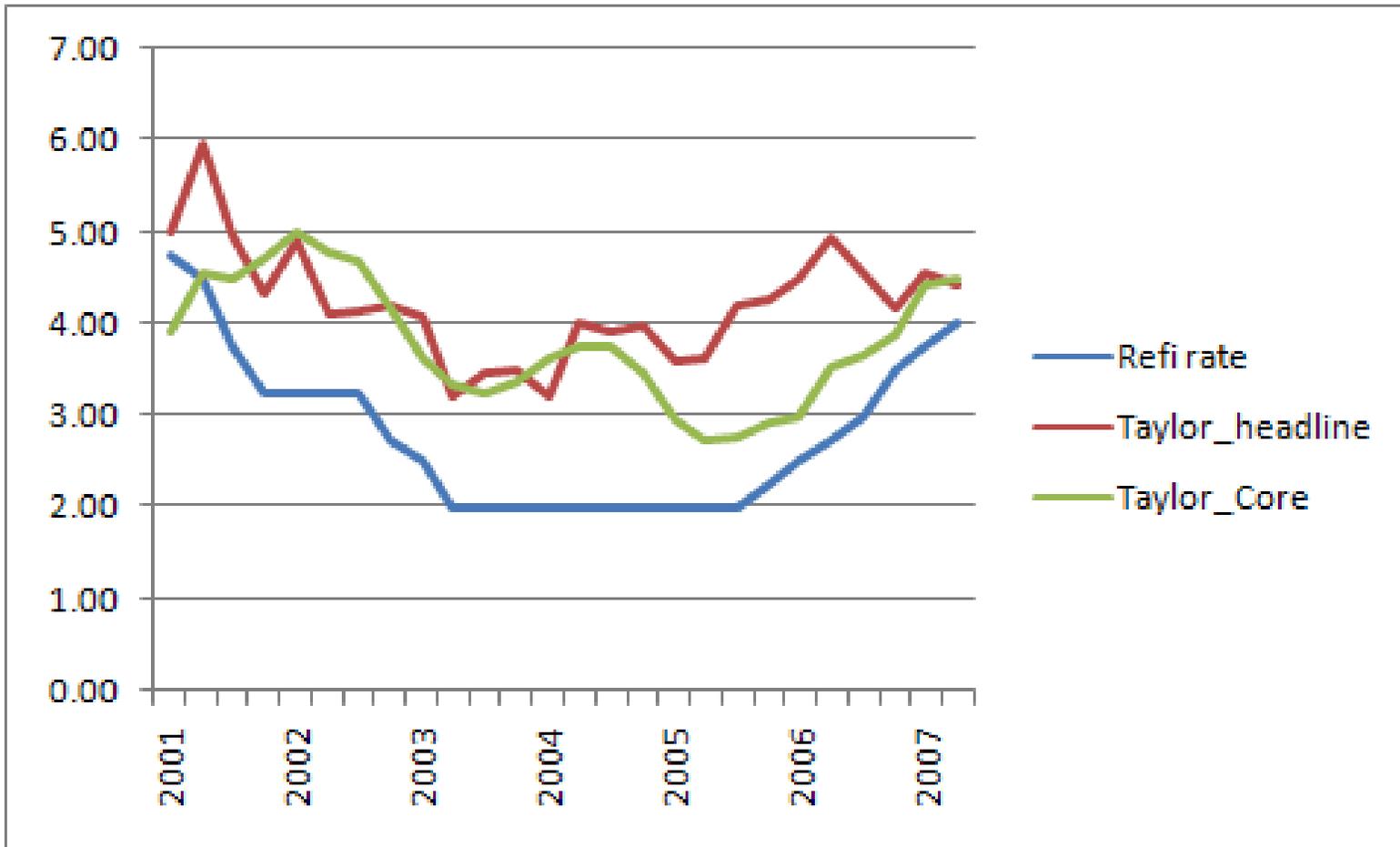
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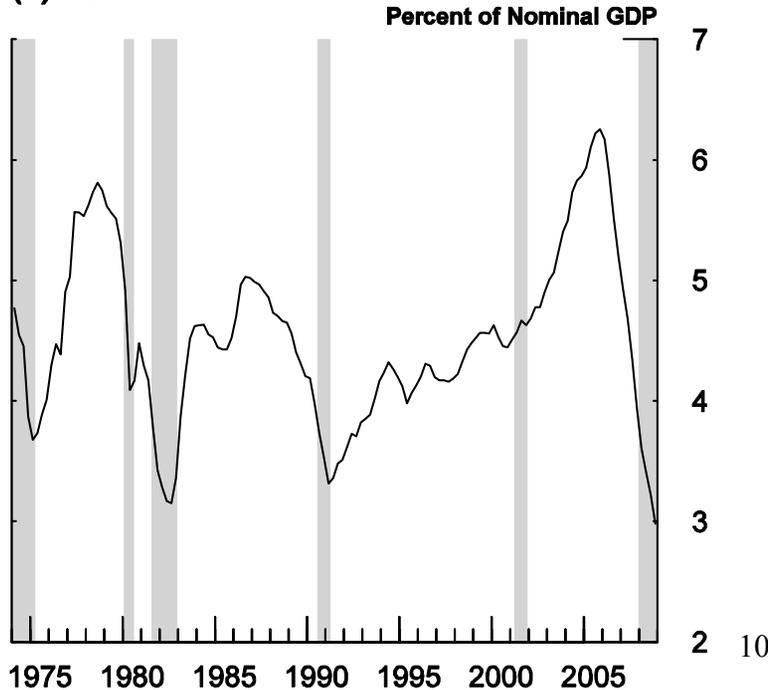


Policy and housing (1)

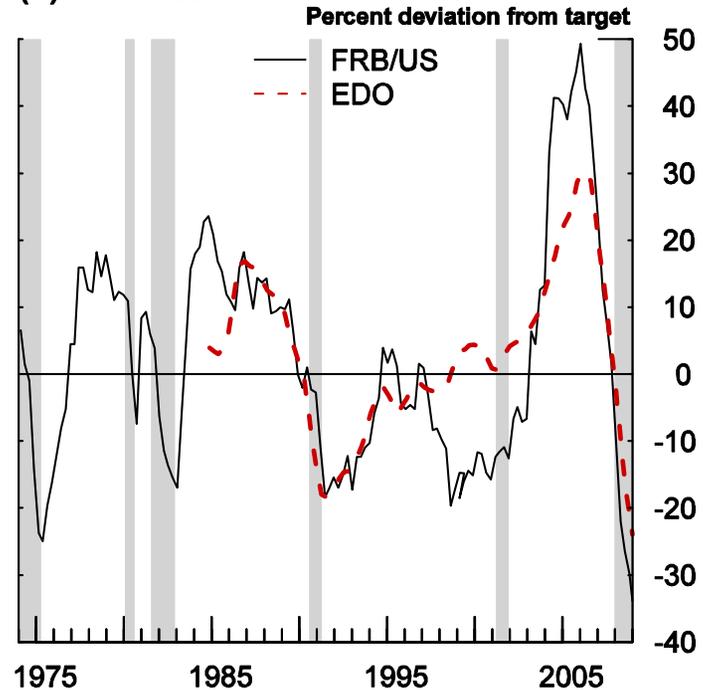
- Policy may have been “loose” by some metrics, “accommodative” by others, and “appropriate” or not depending on preferences/opinions/etc.
- **By any metric, the federal funds rate was low. Did this cause the U.S. housing boom?** Housing is interest sensitive and skyrocketed during this period

Residential investment as a share of GDP and relative to long-run targets

(a) Nominal Residential Investment

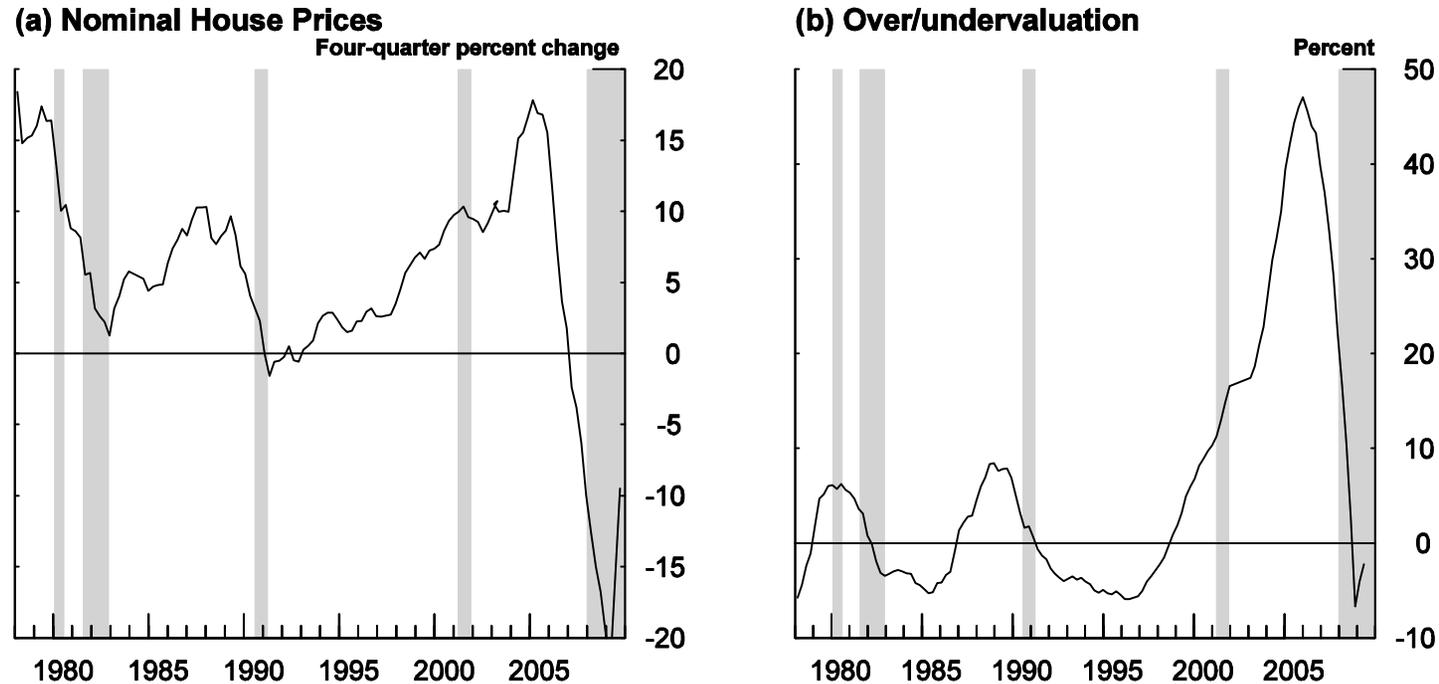


(b) Real Residential Investment



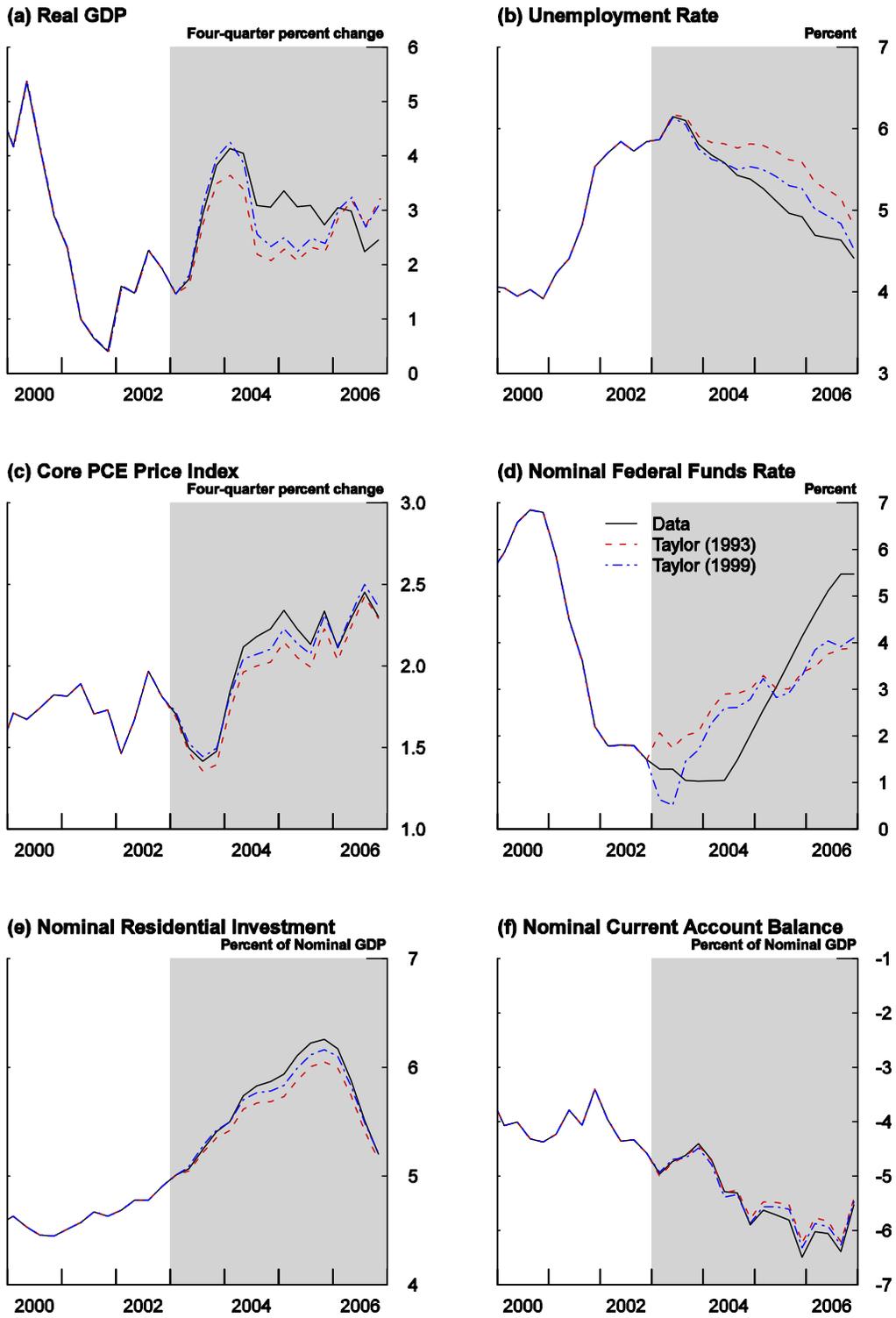
Policy and housing (2)

Nominal House Price Growth and Over/Undervaluation



- House prices began to increase in late 1990s, much faster in 2000s.
- Substantially overvalued during 2003-2006 period

Figure 9: Macroeconomic Implications of Alternative Policy Settings

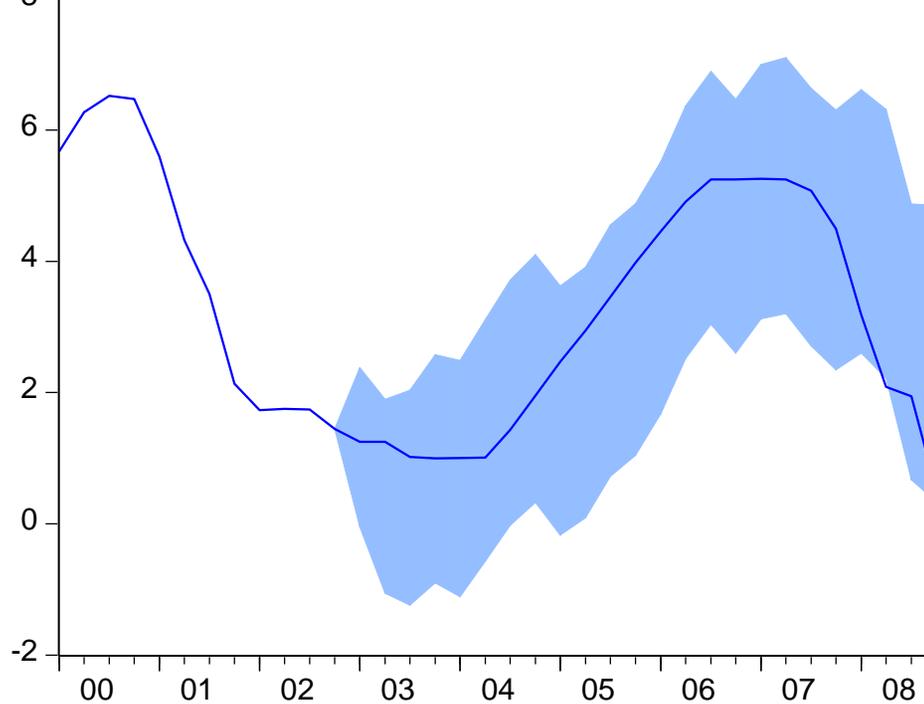


Source: FRB/US Model, Bureau of Economic Analysis, and Bureau of Labor Statistics

Policy and housing (4)

- VAR in U.S. macro and housing variables
 - Was policy loose?
 - Did this cause housing boom?

Conditional Forecast for Federal Funds Rate (percent)

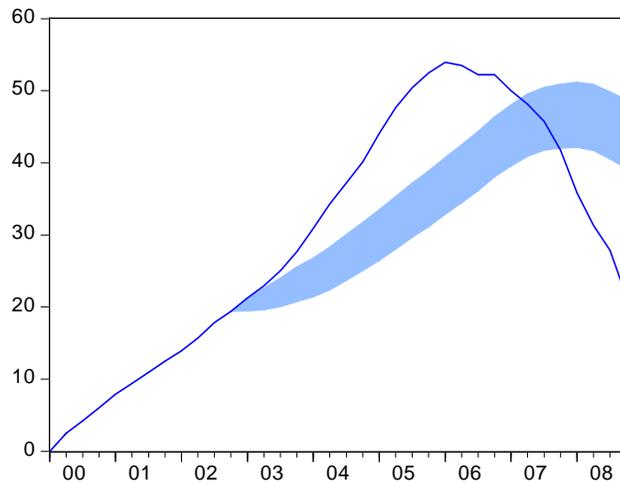


- The setting of policy after 2002 seemed broadly in line with the macro environment

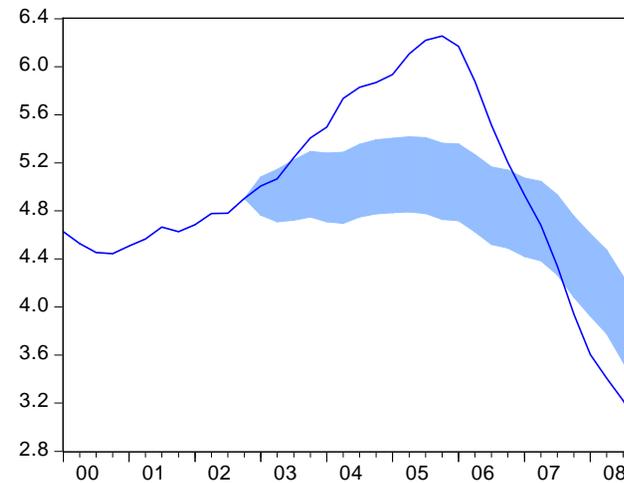
Policy and housing (5)

Conditional Forecasts for Residential Investment Share and House Prices

House Prices (Index=0 in 2000Q1)
(Log units)



Nominal Residential Investment
of nominal GDP

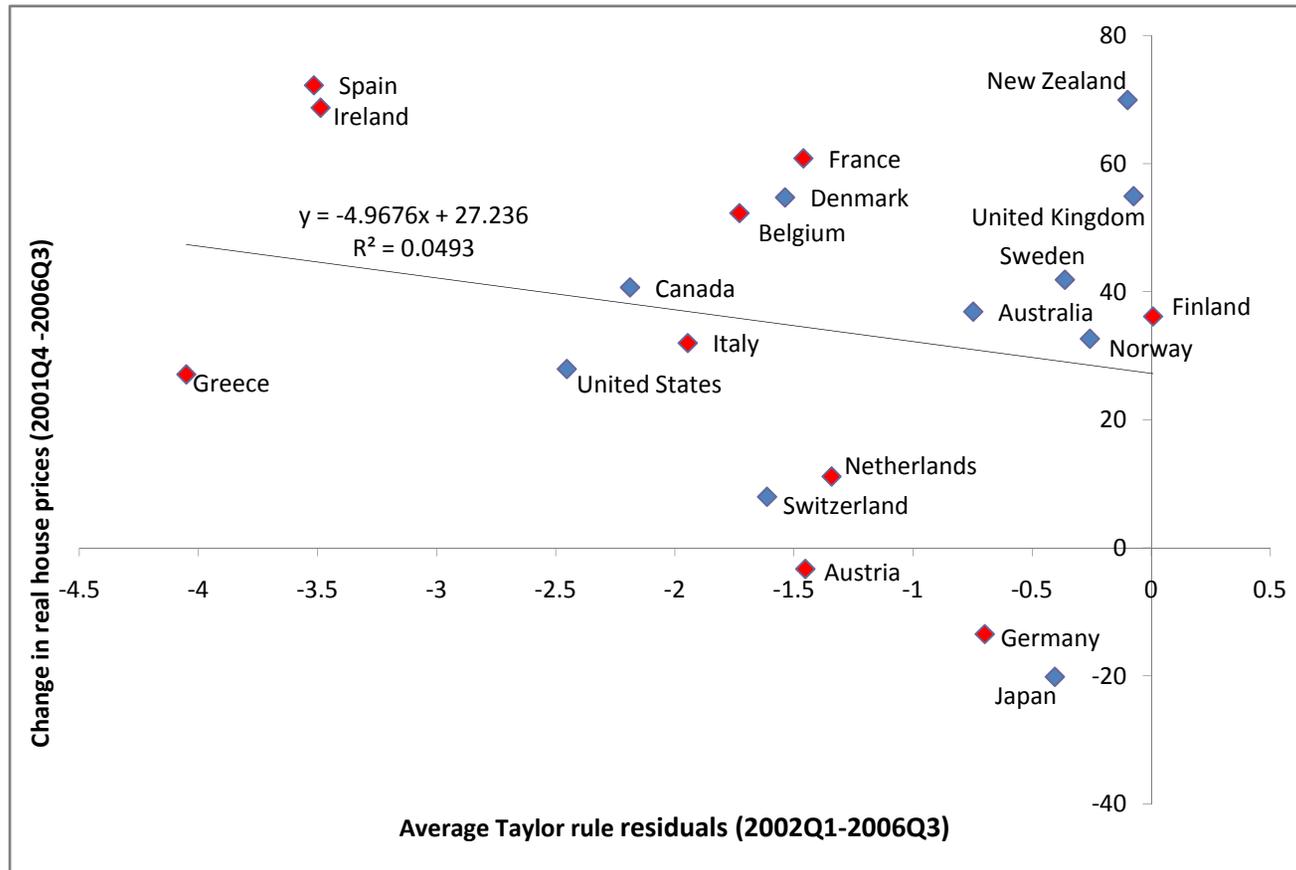


- Outside the 2-standard error bands – unusual given macro environment
- Difficulty assessing interaction between macro factors and housing market will prove important in later discussion

Monetary Policy and Housing in the Advanced Economies

- Strength of housing markets likely supported by stance of monetary policy
- But it seems hard to attribute all of the strength in housing to monetary policy
- Seems more of a secondary factor (WEO, 2009)

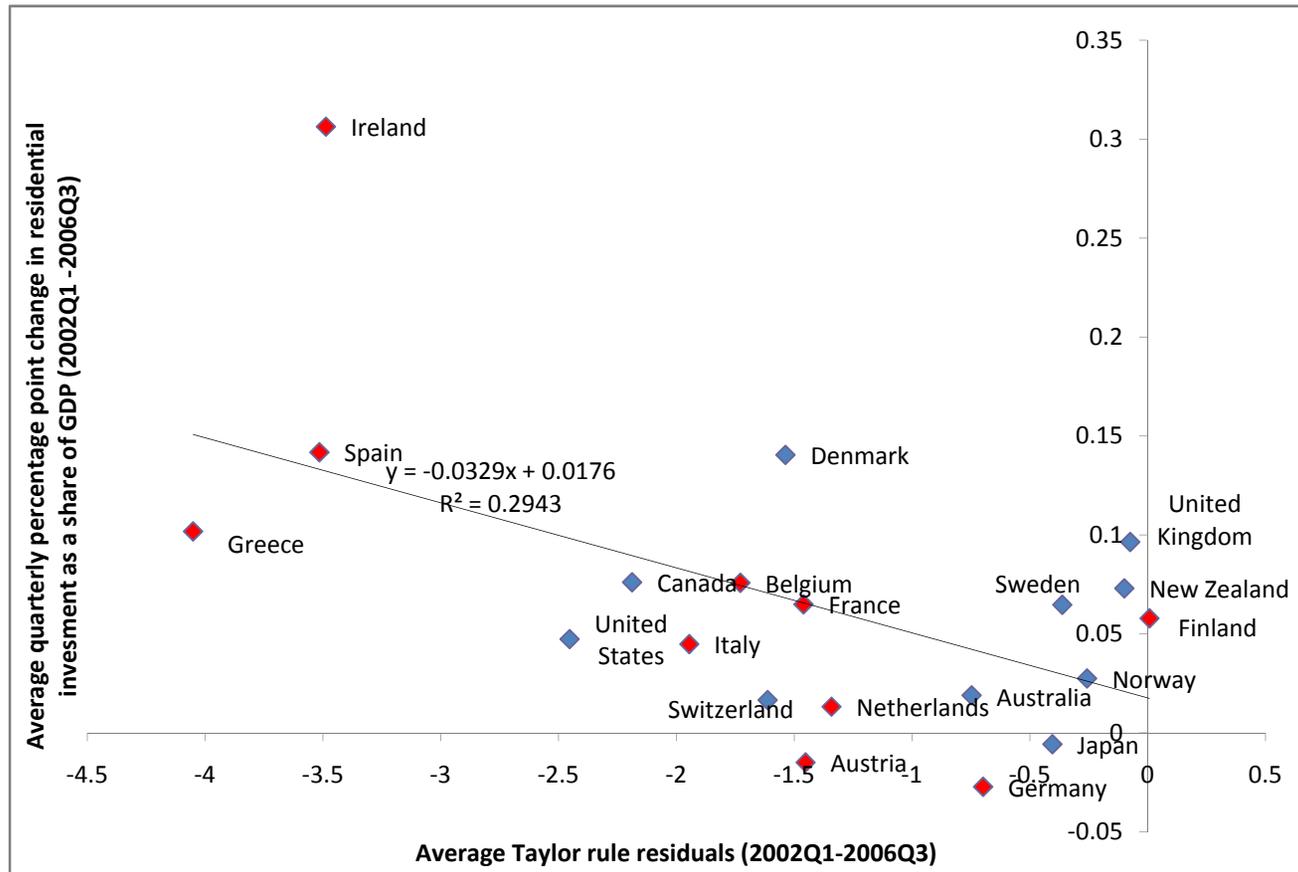
Monetary Policy and House Prices: Advanced Economies



Source: IMF (2009)

- Negative relationship, but statistically insignificant.

Monetary Policy and Residential Investment: Advanced Countries



Source: IMF (2009)

- Statistically significant relationship, mainly due to Ireland.

If macro factors cannot account for housing's strength, what happened?

- Our discussion is somewhat speculative
- Focus on U.S. developments in housing finance
 - Securitization
 - Stretching for affordability through adjustable-rate mortgages
 - Other non-traditional mortgage features (40-yr. amortization, negative amortization, pay-option mortgages)
- What fueled these developments? A bubble mentality? (Shiller, 2007, Gorton, 2008)
 - A belief that house prices “could not fall”?
 - Over-reliance on simple time series models (like our VAR) (e.g., Gerardi et al, 2008)

**Table 3: Initial Monthly Payments and
Fixed-Rate Mortgage Equivalents¹**

Mortgage Product	Initial Monthly Payment	Loan Amount (FRM Equivalent)	House Price (FRM Equivalent)
Fixed-rate mortgage	\$1,079.19	\$180,000	\$225,000
ARM	903.50	215,000	268,750
Interest-only ARM	663.00	292,990	366,238
40-yr amortization	799.98	242,820	303,525
NegAm ARM ²	150.00	1,295,030	1,618,785
Pay-option ARM	<150.00	1,295,030+	1,618,785+

¹ We use the average Freddie Mac PMMS rates from 2003 through 2006 (6.00 percent for FRMs, 4.42 percent for ARMs). A 20 percent down payment is assumed.

² We use an initial interest rate of 1 percent.

Source: Authors' calculations.

Conclusions and lessons

- Monetary policy does not account for a substantial share of the housing boom, and housing-specific developments are unusual in this period.
- Should Monetary Policy Have Leaned against the Wind (asset prices) More Forcefully?
 - Intense debate over bubble in real time
 - Macroeconomic costs – house prices seem weakly related to monetary policy, while unemployment and inflation are more strongly related
 - Even those who argue for a more forceful response often focus on credit (e.g., Borio and co-authors) – might regulation be a less blunt tool?
- Macroprudential Regulation
 - Borio (2008): relationship b/w financial crisis and financial system & leverage.
 - Research at a very early stage. Will macroprudential regulation be effective?
- Policy with Multiple Objectives
 - Monetary policy aims for full employment and price stability – two objectives, one instrument. Can it do more?
 - Policy coordination – fiscal balance, financial regulation, and int'l policy coordination?