

# **Forecasting Inflation and Growth: Do Private Forecasts Match Those of Policymakers?**

**William T. Gavin and Rachel J. Mandal**

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# FOMC and Blue Chip Forecasts

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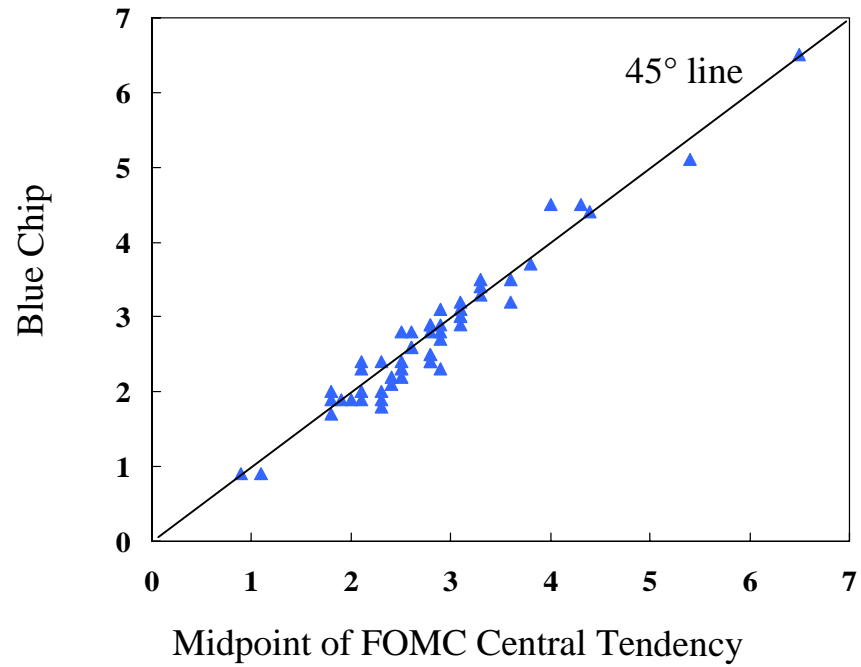
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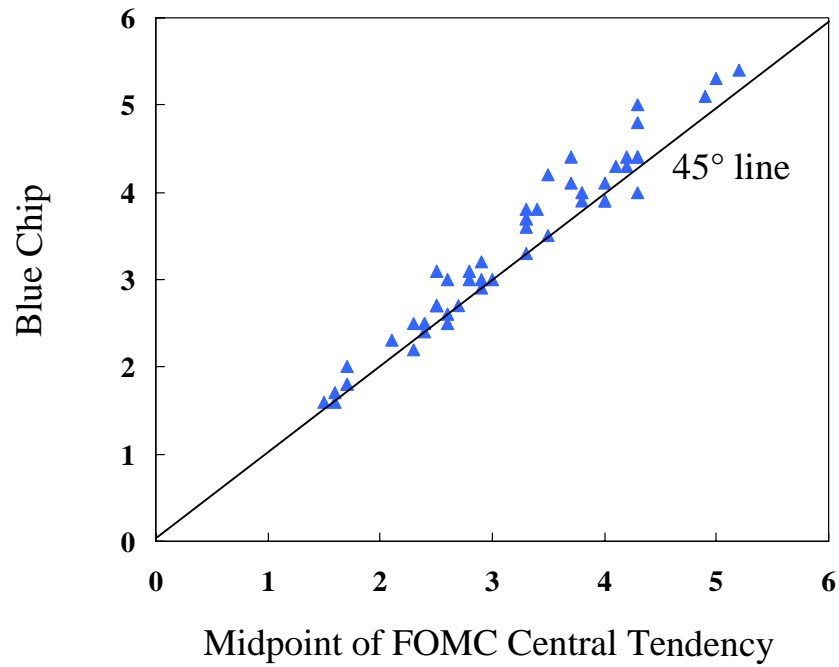
- FOMC -- made in Jan/Feb and Jun/Jul
- Blue Chip -- made in first three days of Feb and July
- Begin in 1983 -- first central tendency reported
- Forecast Horizons at 6, 12, and 18 month horizons

# Output Forecasts



Blue Chip and FOMC forecasts from 1983 through 2000.

# Inflation Forecasts



Blue Chip and FOMC forecasts from 1983 through 2000.

# Green Book Forecasts

- Green Book -- made in Jan and Jun (end of month before the meeting)

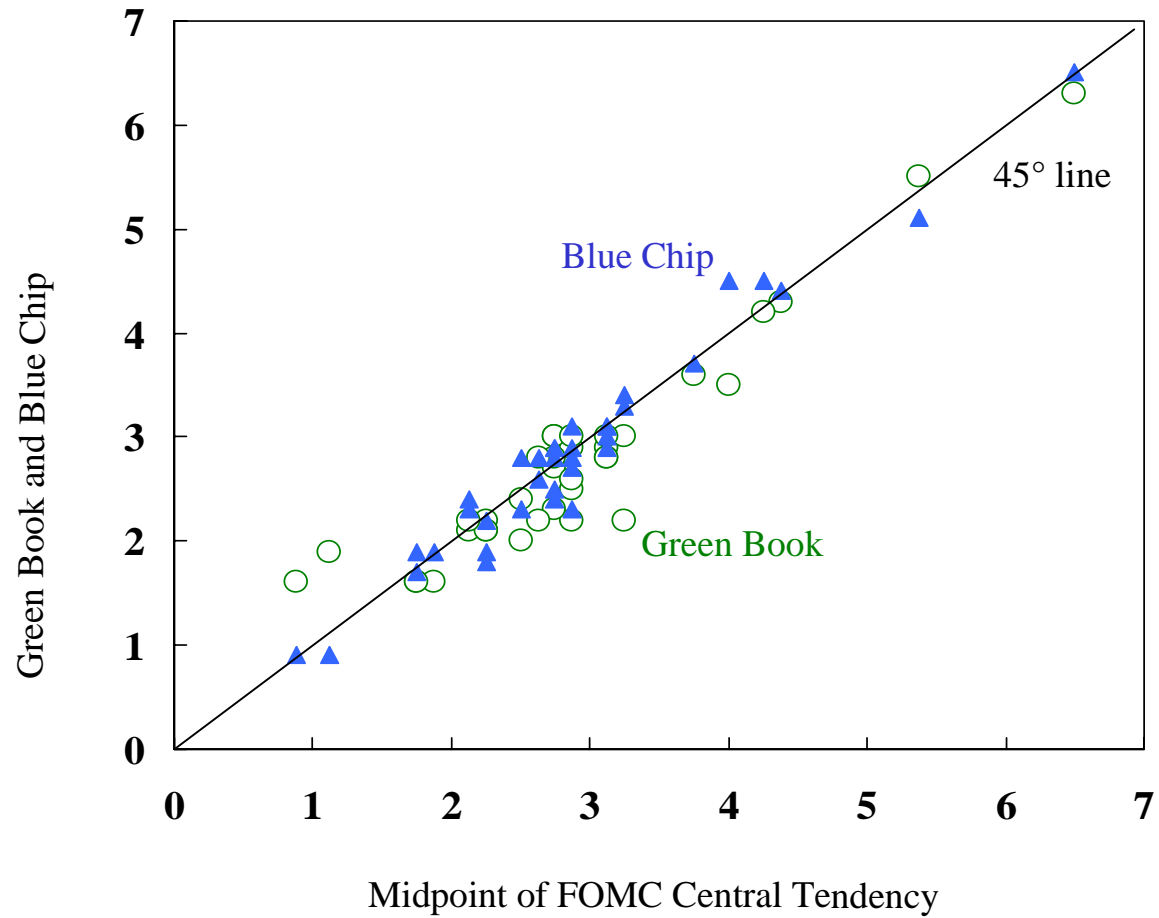
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- Reported by Romer and Romer (2000) to be most accurate over many private forecasts

# Output Forecasts (1983-1994)

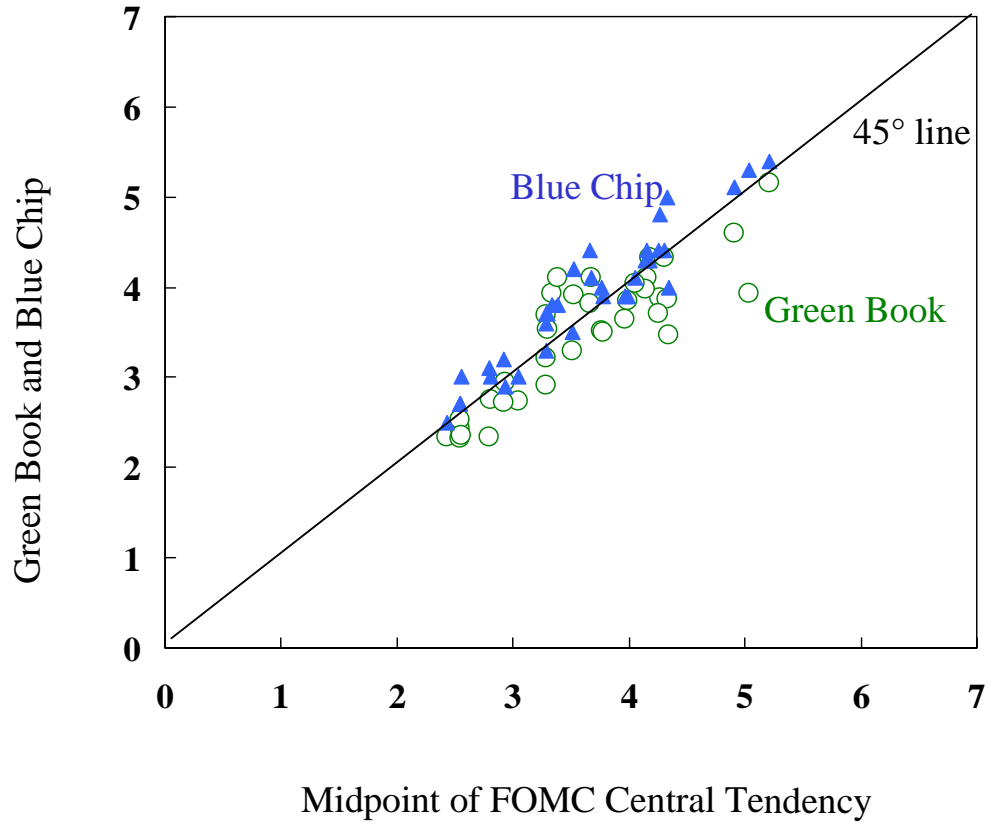


## Blue Chip versus Green Book as a Proxy for FOMC forecasts (1983-1994)

	RMSE of Output Forecast	
	Blue Chip	Green Book
All 3 Horizons	<b>0.22</b>	0.36
6 Month Horizon	<b>0.17</b>	0.35
12 Month Horizon	<b>0.25</b>	0.32
18 Month Horizon	<b>0.24</b>	0.40

Blue Chip is a better “forecast” of the FOMC forecasts.

# Inflation Forecasts (1983-1994)



## Blue Chip versus Green Book as a Proxy for FOMC forecasts (1983-1994)

	RMSE of Inflation Forecast	
	Blue Chip	Green Book
All 3 Horizons	<b>0.32</b>	0.38
6 Month Horizon	<b>0.21</b>	0.25
12 Month Horizon	<b>0.32</b>	0.38
18 Month Horizon	<b>0.40</b>	0.47

Blue Chip is a better “forecast” of the FOMC forecasts.

# How Accurate?

- First we compare 1983-1994 for all three.

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- Then we compare 1995-1999 for the Blue Chip and Fed Policymakers.

## Accuracy of Output forecasts Root Mean Square Error 1983 to 1994

	Blue Chip	FOMC Members	Green Book
All 3 Horizons	<b>0.94</b>	0.96	1.05
6 Month Horizon	0.76	<b>0.74</b>	0.80
12 Month Horizon	<b>1.05</b>	1.11	1.23
18 Month Horizon	<b>0.99</b>	1.00	1.06

Best forecast is in bold typeface.

## Accuracy of Inflation forecasts Mean Error 1983 to 1994

	Blue Chip	FOMC Members	Green Book
All 3 Horizons	0.69	0.46	<b>0.35</b>
6 Month Horizon	0.45	0.33	<b>0.21</b>
12 Month Horizon	0.60	0.41	<b>0.26</b>
18 Month Horizon	1.01	0.65	<b>0.57</b>

Here the forecasts are biased above the actual, the Green Book had the smallest bias.

## Accuracy of Inflation forecasts Root Mean Square Error 1983 to 1994

	Blue Chip	FOMC Members	Green Book
All 3 Horizons	0.92	0.80	<b>0.65</b>
6 Month Horizon	0.64	0.55	<b>0.36</b>
12 Month Horizon	0.79	0.74	<b>0.61</b>
18 Month Horizon	1.23	1.05	<b>0.88</b>

Notice that the RMSE's are not much larger than the average errors, in contrast to the case of output forecasts.

## Accuracy of Output forecasts Mean Error 1995 to 1999

	Blue Chip	FOMC Members	Green Book
All 3 Horizons	-1.13	<b>-1.02</b>	NA
6 Month Horizon	<b>-0.52</b>	-0.53	NA
12 Month Horizon	-1.26	<b>-1.01</b>	NA
18 Month Horizon	-1.73	<b>-1.65</b>	NA

Here the forecasts are biased below the actual; the policymakers had less bias at the one-year horizon.

## Accuracy of Output forecasts Root Mean Square Error 1995 to 1999

	Blue Chip	FOMC Members	Green Book
All 3 Horizons	1.46	<b>1.35</b>	NA
6 Month Horizon	0.81	<b>0.73</b>	NA
12 Month Horizon	1.67	<b>1.50</b>	NA
18 Month Horizon	1.78	<b>1.71</b>	NA

Notice that the RMSE's are not much larger than the average errors, in contrast to the case of the earlier, and longer, period.

## Accuracy of Inflation forecasts Mean Error 1995 to 1999

	Blue Chip	FOMC Members	Green Book
All 3 Horizons	0.59	<b>0.48</b>	NA
6 Month Horizon	0.36	<b>0.29</b>	NA
12 Month Horizon	0.52	<b>0.37</b>	NA
18 Month Horizon	0.98	<b>0.86</b>	NA

Best forecast is in bold typeface.

## Accuracy of Inflation forecasts Root Mean Square Error 1995 to 1999

	Blue Chip	FOMC Members	Green Book
All 3 Horizons	0.72	<b>0.64</b>	<b>NA</b>
6 Month Horizon	0.43	<b>0.39</b>	<b>NA</b>
12 Month Horizon	0.64	<b>0.50</b>	<b>NA</b>
18 Month Horizon	1.03	<b>0.96</b>	<b>NA</b>

Again, the RMSE's are not much larger than the average errors. During this five-year period, the forecasts have been consistently pessimistic, predicting too little growth and too much inflation.

# Are the Differences Economically Relevant?

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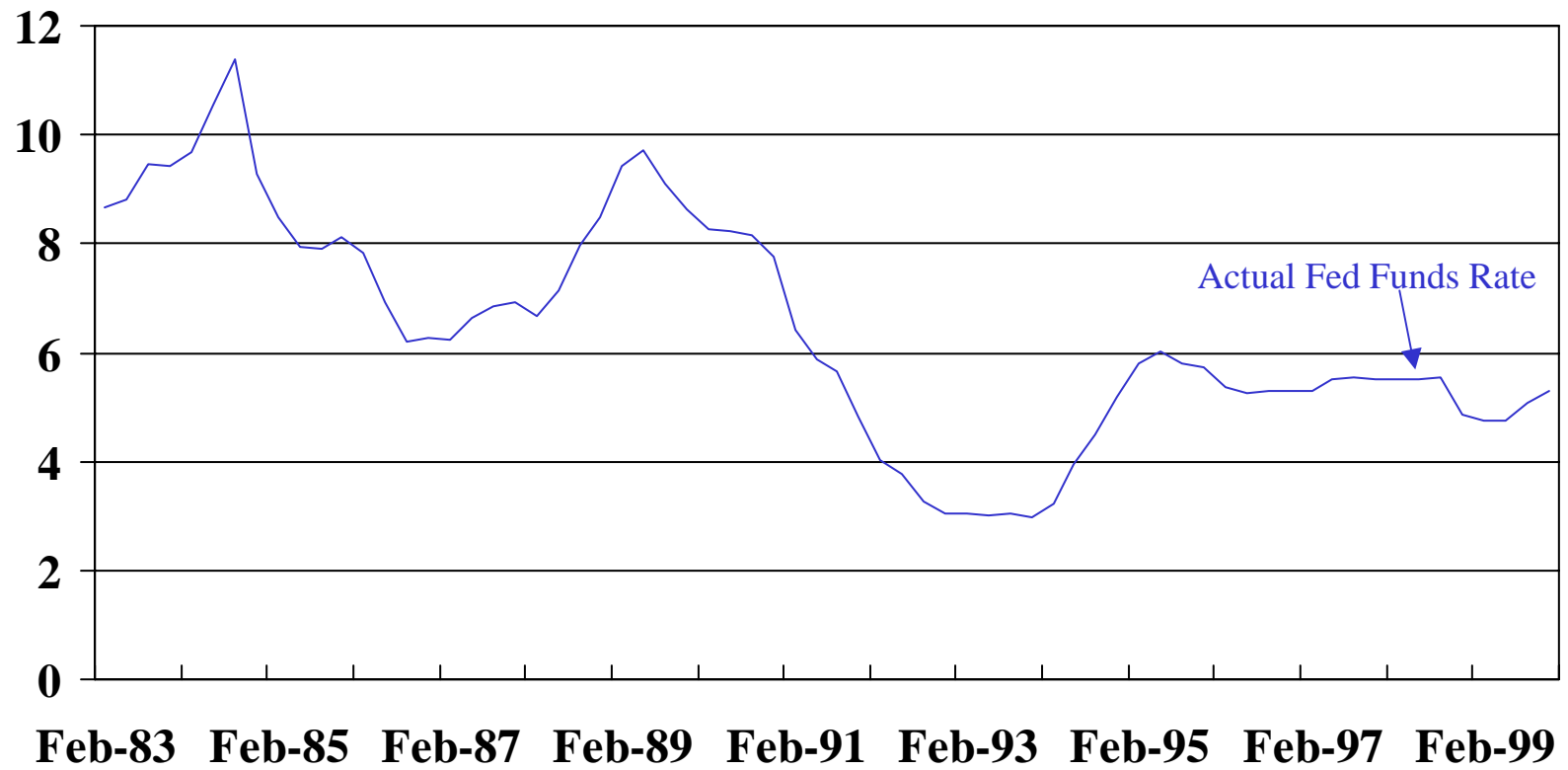
- Would policy have been different if the Blue Chip forecasts were being used by the FOMC to make policy?
- To answer that question we need a model of the policy process that includes a mechanism for using the forecasts.
- The Taylor Rule is a popular and simple characterization of the policy process.

# Taylor's Rule

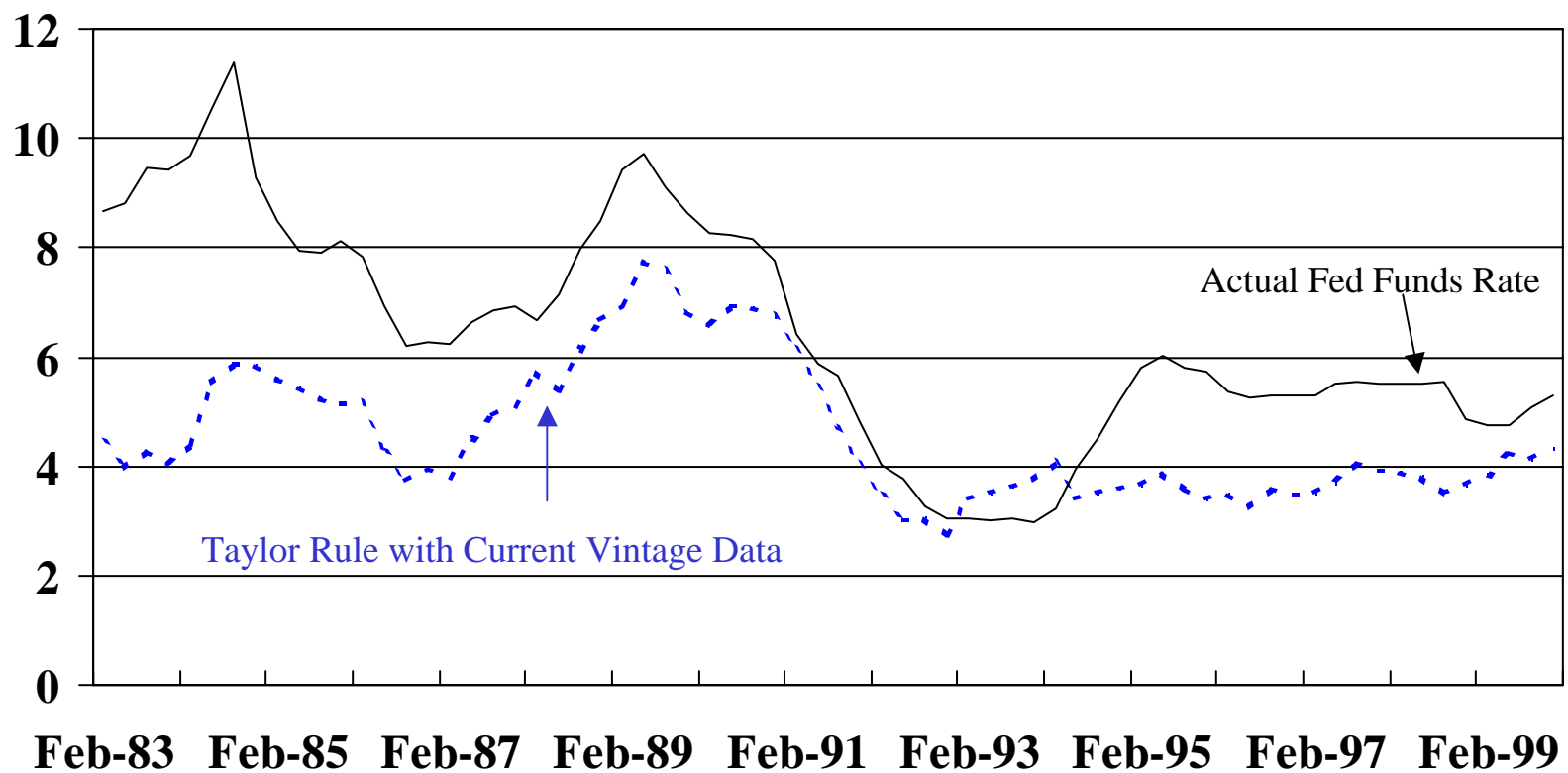
Federal Funds Target =

$$r^e + \frac{\pi}{t+1} + .5 \left( \frac{\pi}{t+1} - \frac{\pi}{T} \right) + .5 (y_{t+1} - y_{t+1}^F)$$

# Fed Funds Rate



# Taylor Rule -- Current Data



# Real-Time Data

- What were policymakers looking at when the fed funds rate target was set?

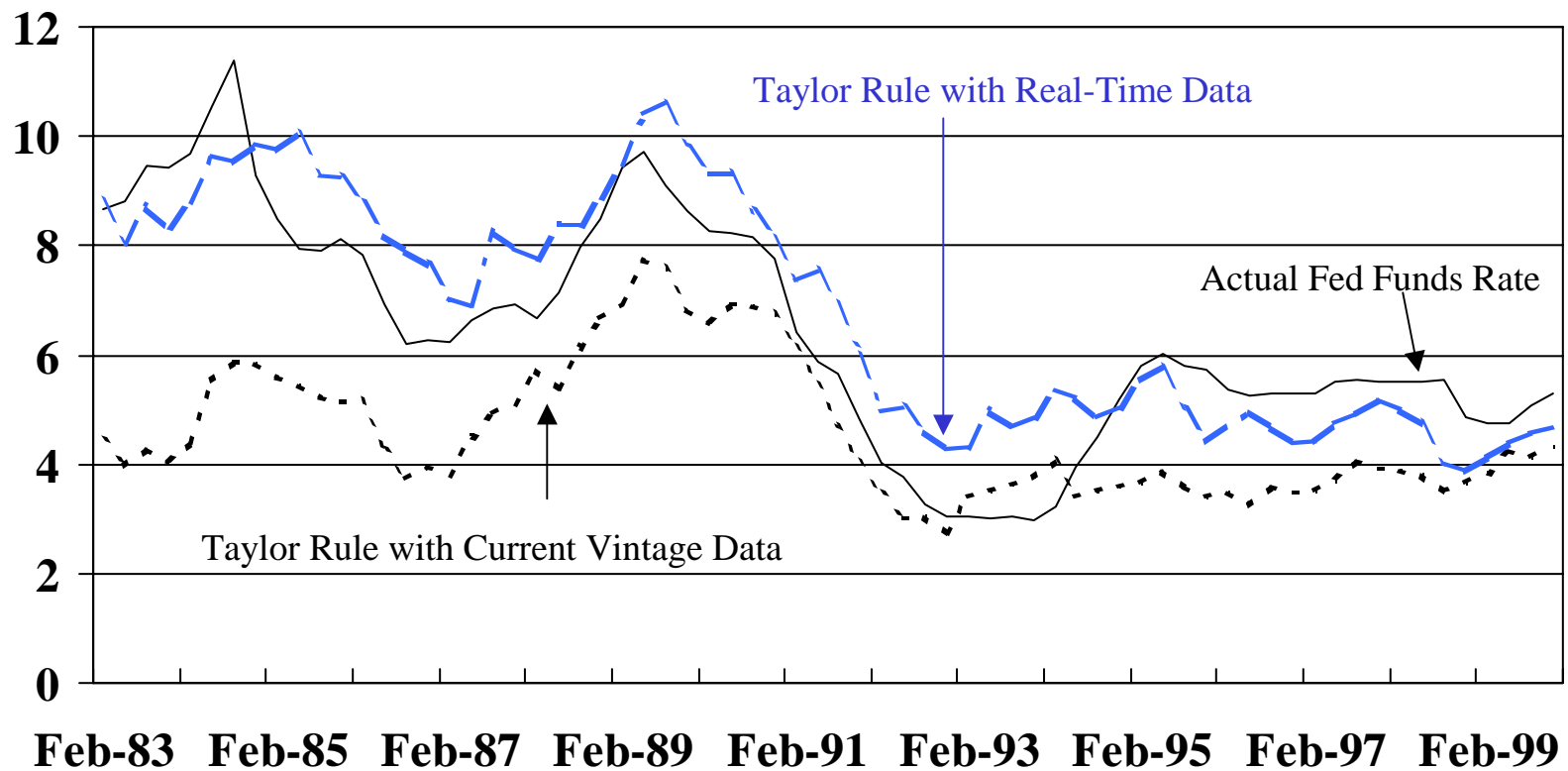
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- See the FRB Philadelphia's web site to find a quarterly series of real-time data sets.

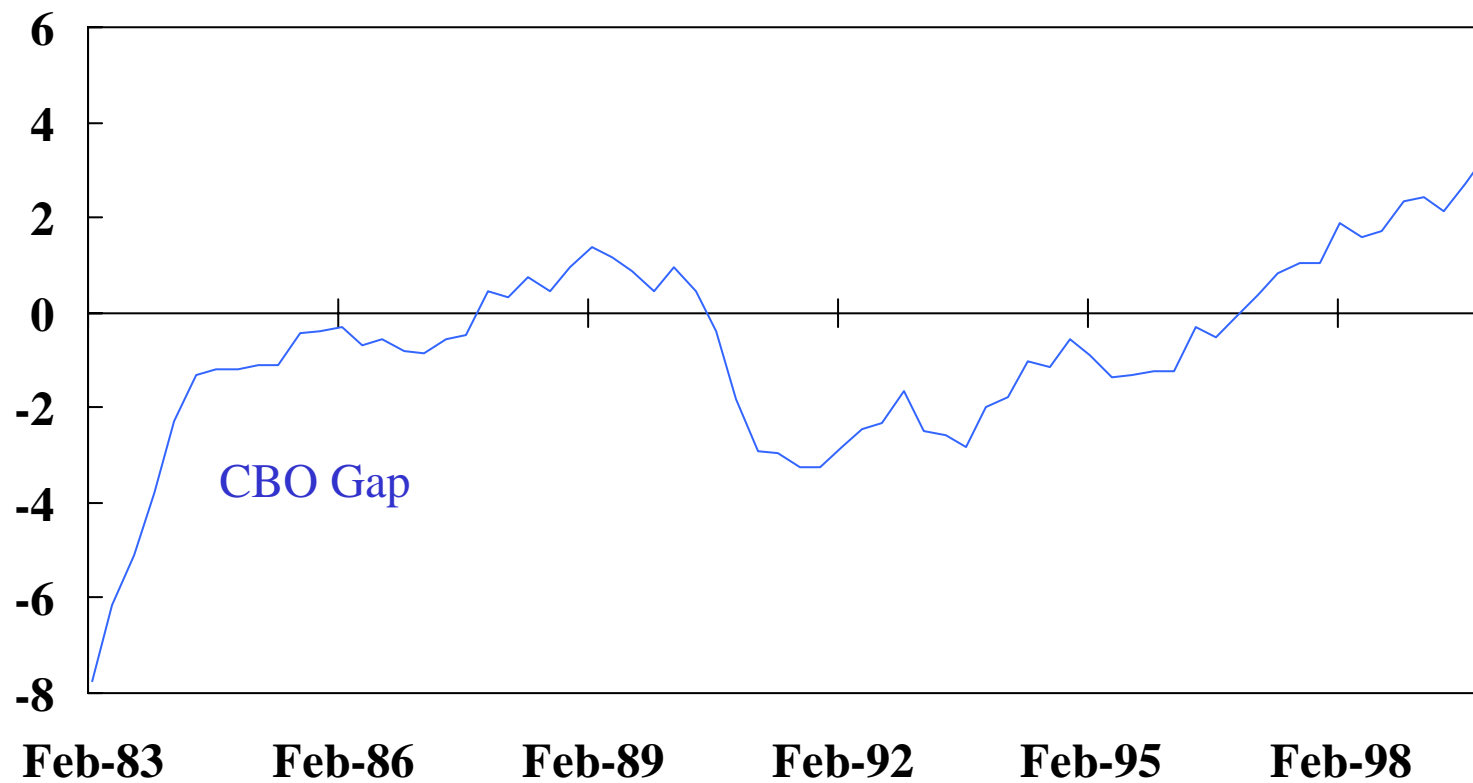
# Real-Time Data

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- We constructed potential output as a quadratic time trend using data available in that quarter.

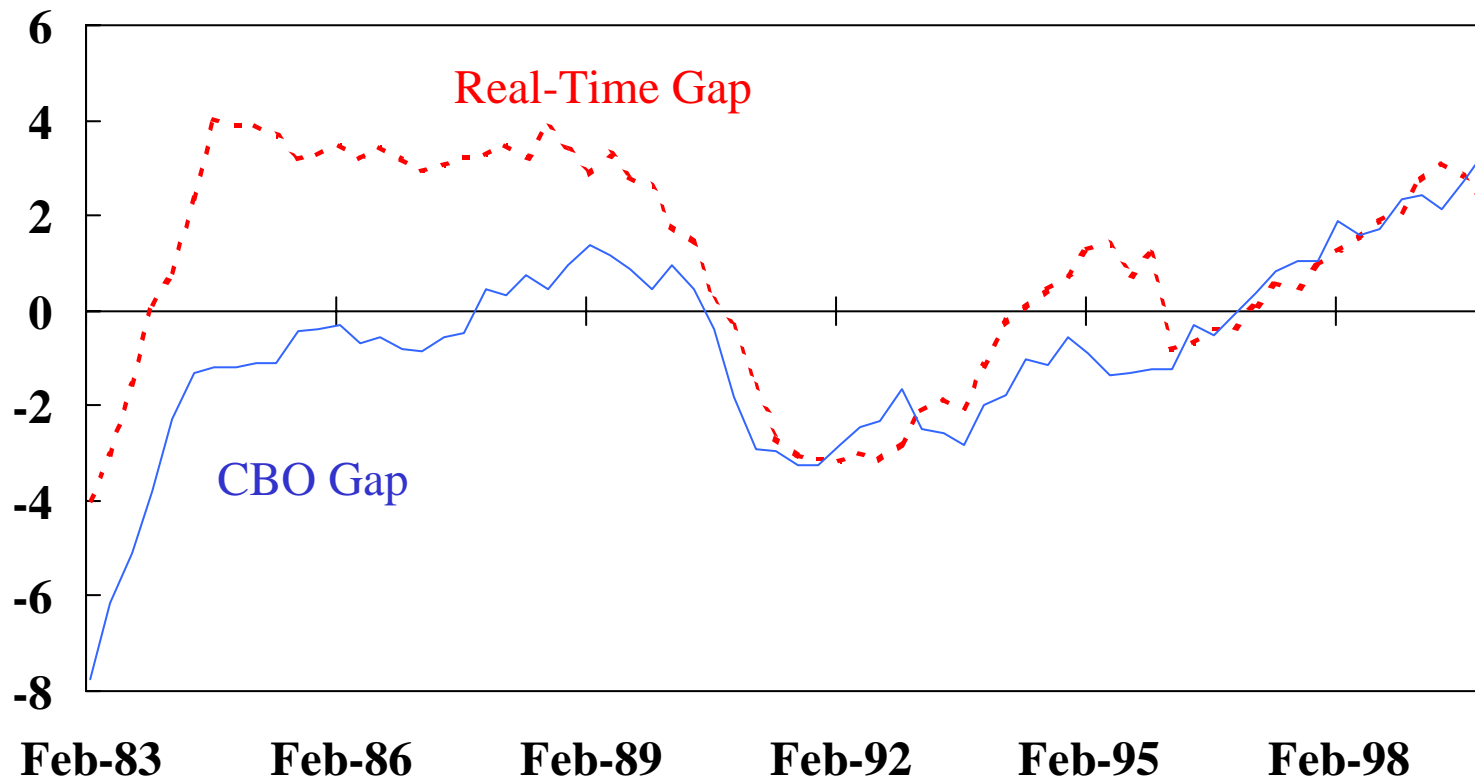
# Taylor Rule -- Current versus Real-Time Data



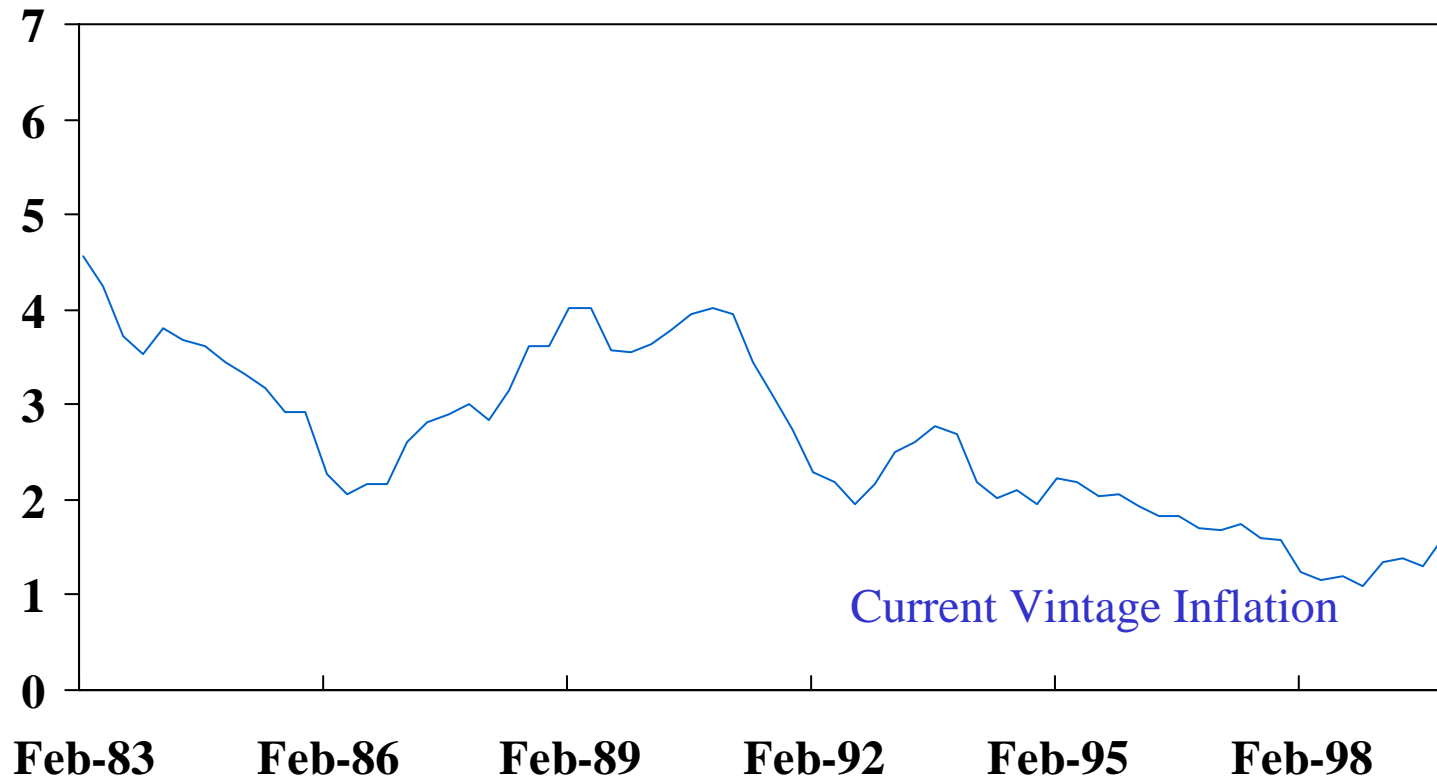
# GDP GAP -- Current CBO



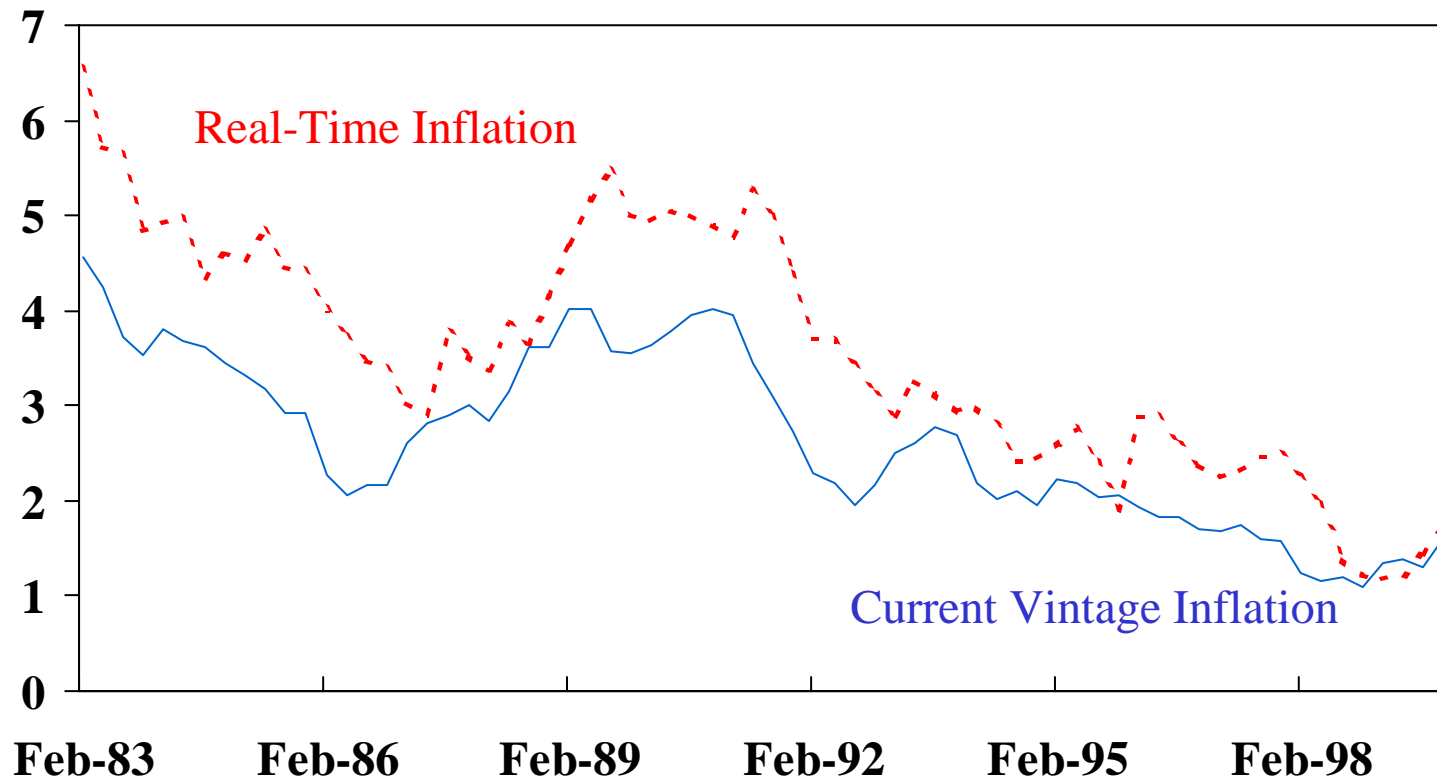
# GDP GAP -- Current CBO and Real Time Quadratic Time Trend



# GDP Inflation--Current Vintage Data



# GDP Inflation--Current and Real Time



# Using Taylor Rules to Evaluate the Relevance of Forecasts

Federal Funds Target =

$$r^e + \underline{\frac{e}{t}} \cdot .5 \left( \underline{\frac{e}{t}} \cdot \frac{T}{t} \right) \cdot .5 (y_t^e - y_t^{Fe})$$

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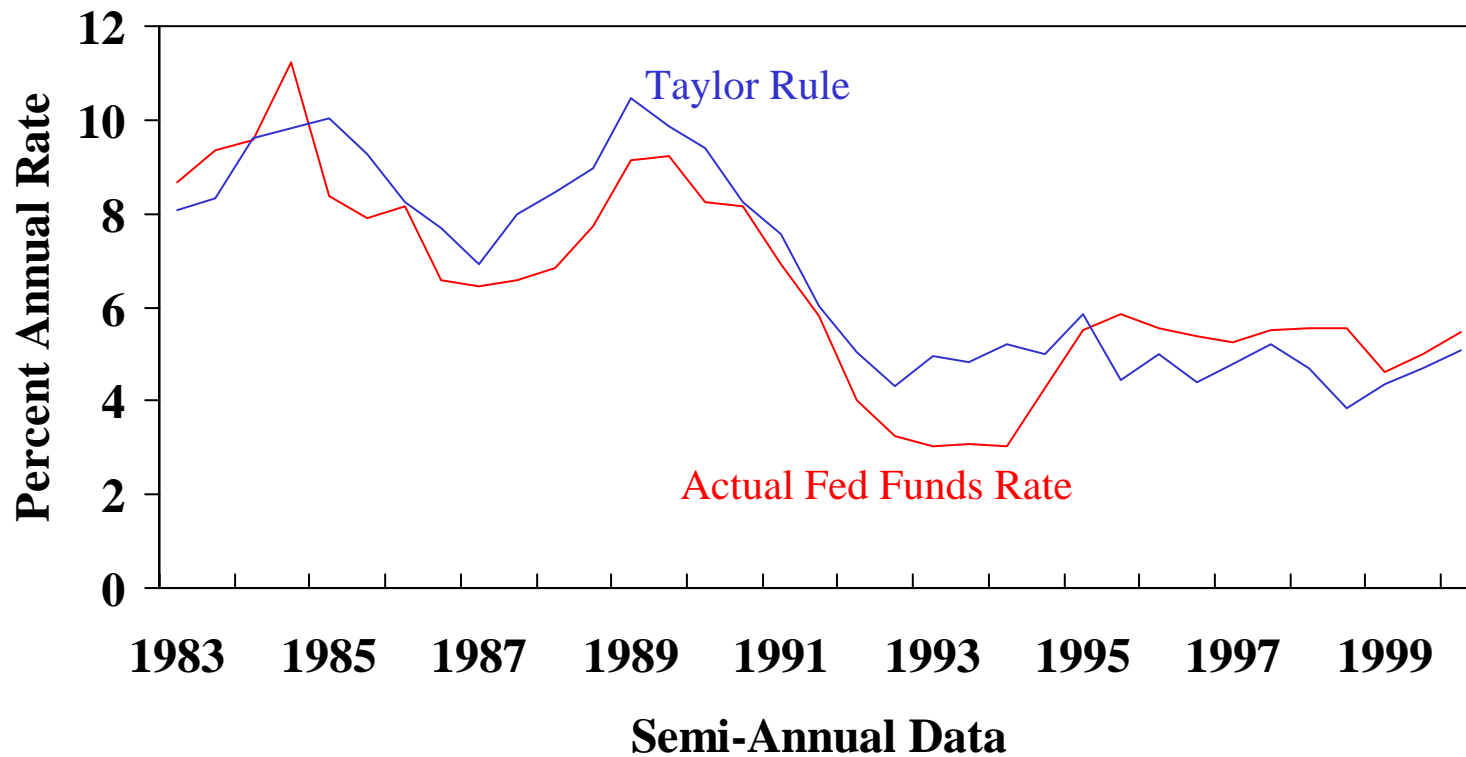
$$r^e + \cancel{\frac{e}{t}} \cdot .5 ( \cancel{\frac{e}{t}} \cdot \cancel{T} ) \cdot .5 ( \underline{y_t^e} - y_t^{Fe} )$$

# Using Taylor Rules to Evaluate the Relevance of Forecasts

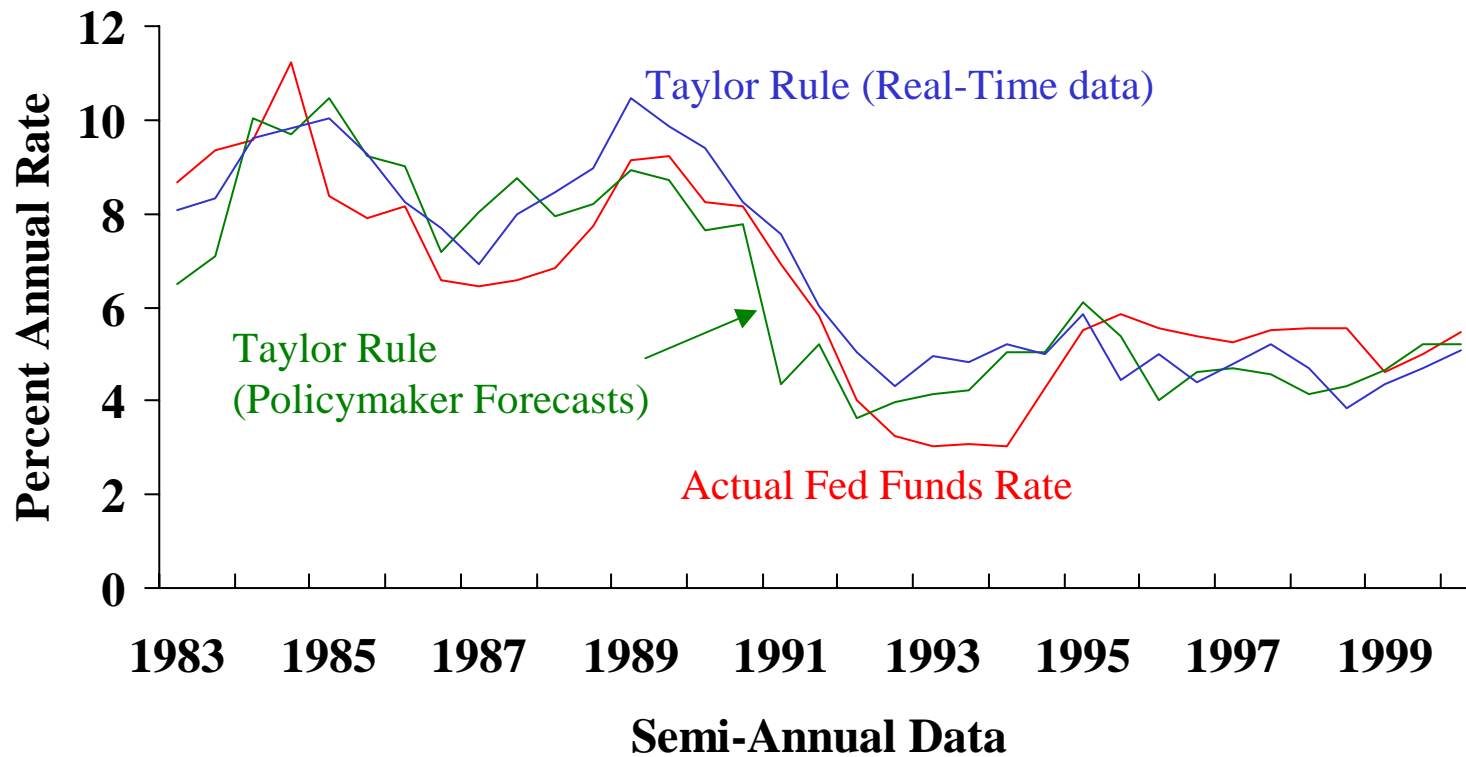
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# Taylor Rule (Real-Time Data)



# Taylor Rule (With Policymaker Forecasts)



# Taylor Rule (With Blue Chip Forecasts)

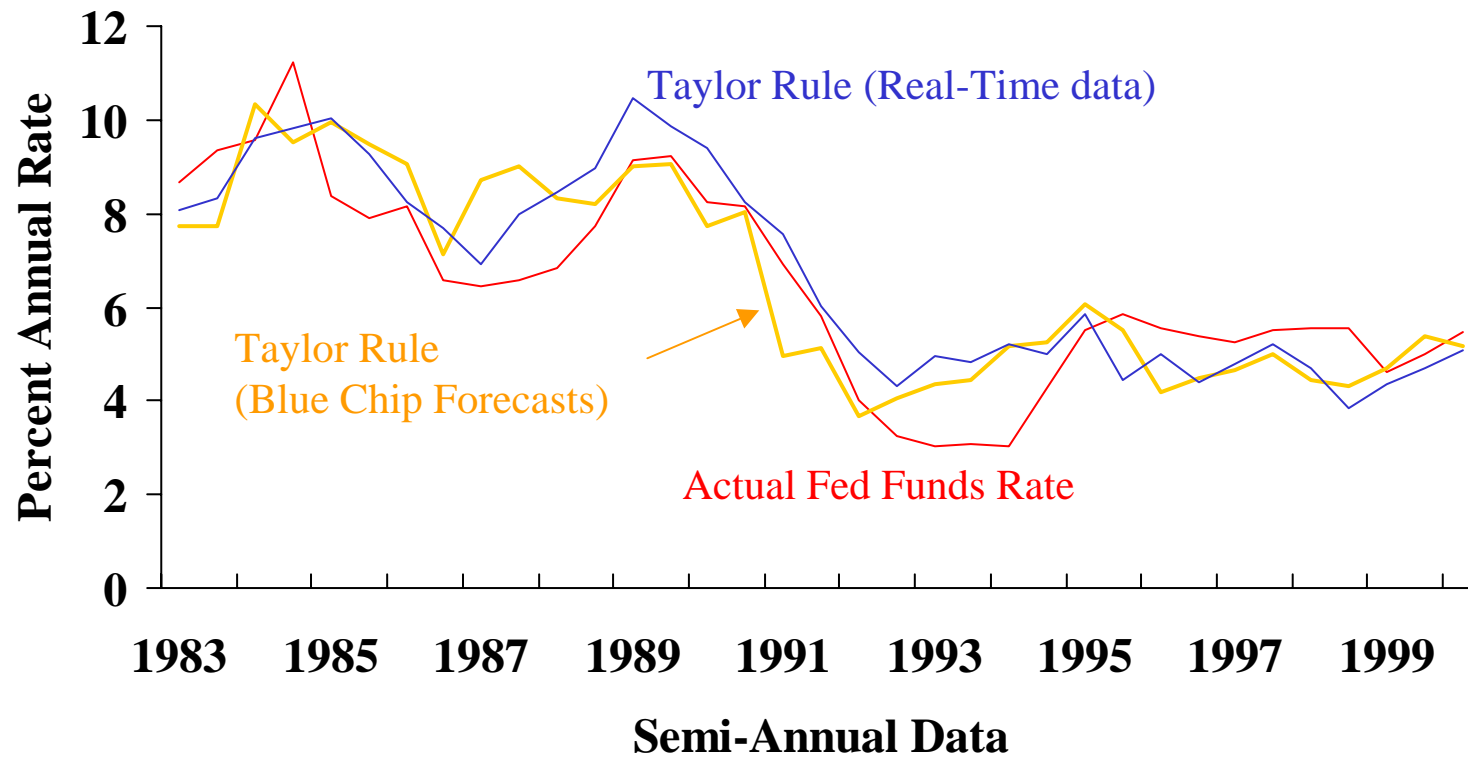
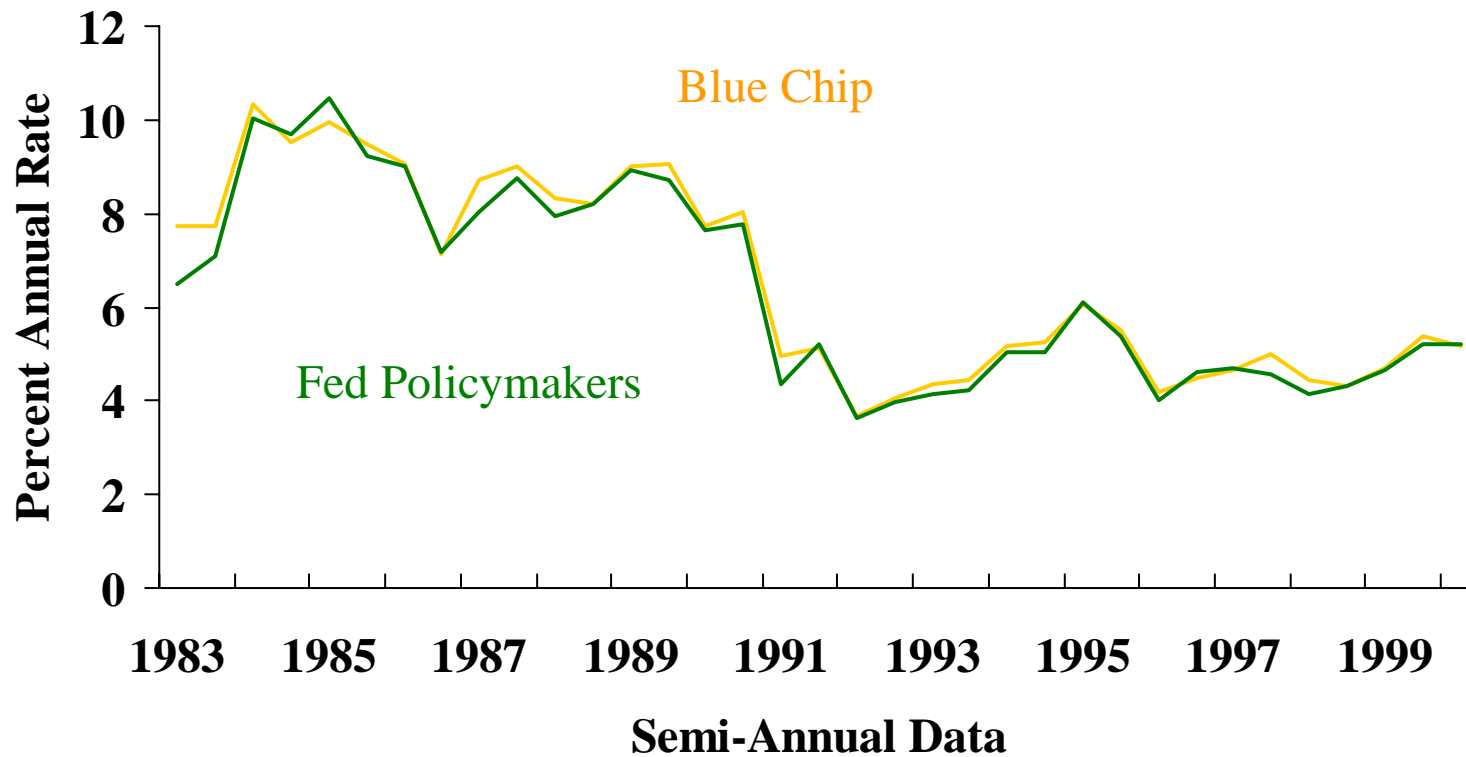


Figure 4  
Taylor Rules (Blue Chip and Fed Policymaker)



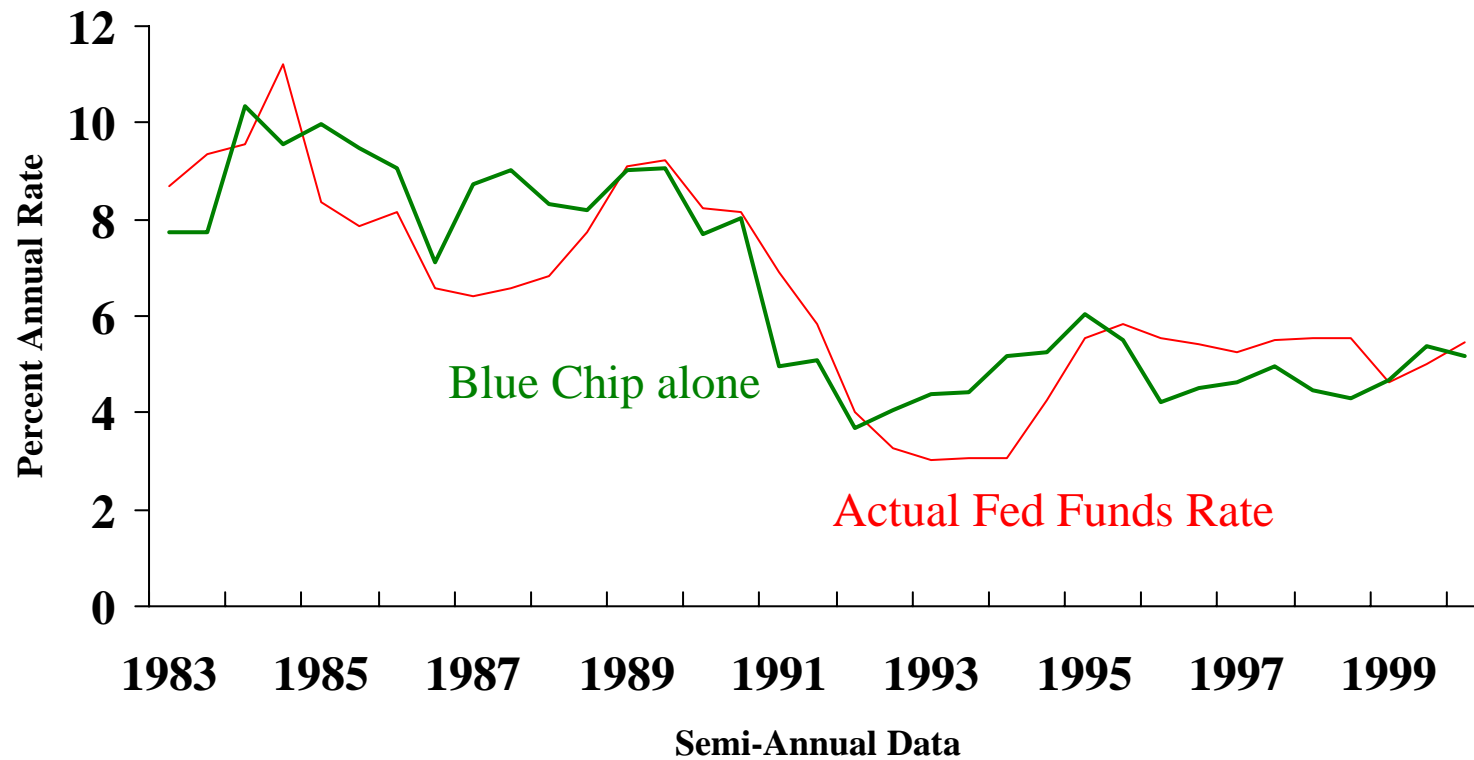
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- Purely forward-looking rules are not well defined in economic models with rational expectations.

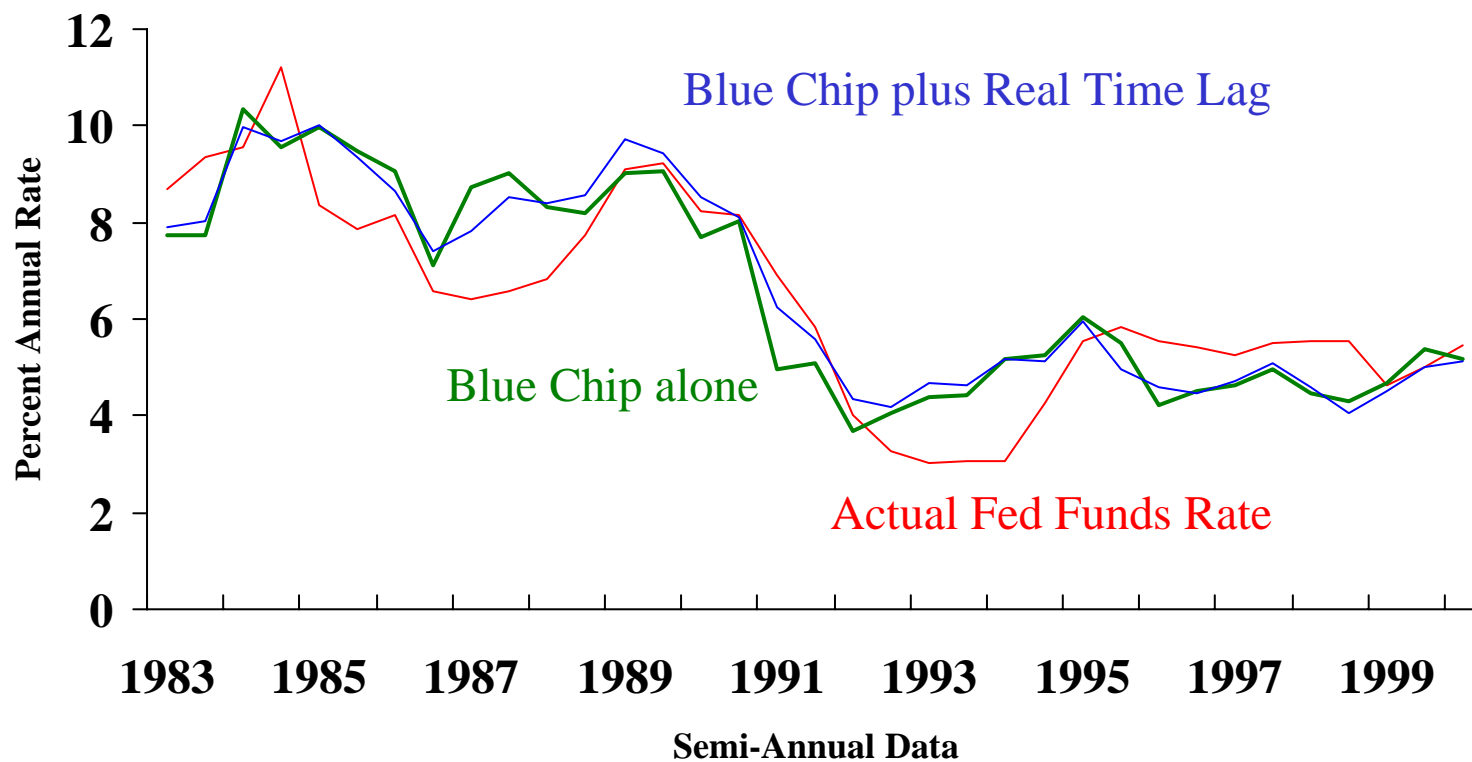
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- Intuitively, if the Fed uses the market's forecast to set policy and the market's forecast is based on what it expects the Fed to do, then the forecasts may not be informative.

# Taylor Rules (Blue Chip Forecast)



# Taylor Rules (Blue Chip Forecast and Real Time Lag)



# Alternative Versions of the Taylor Rule

	Actual Fed Funds Rate	Current Revised Data	Real-Time Data	Blue Chip Forecast	Fed Policymaker Forecasts
Current Revised Data	<b>0.73</b>				
Real-Time Data	<b>0.87</b>	<b>0.82</b>			
Blue Chip Forecast	<b>0.84</b>	<b>0.67</b>	<b>0.92</b>		
Fed Policy-maker Forecasts	<b>0.82</b>	<b>0.67</b>	<b>0.91</b>	<b>0.99</b>	
Comb: Real Time and Blue Chip	<b>0.88</b>	<b>0.76</b>	<b>0.98</b>	<b>0.98</b>	<b>0.97</b>

Correlations among the alternative predictions of the Taylor Rule and the actual fed funds rate are shown in bold.

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# Alternative Versions of the Taylor Rule

	Actual Fed Funds Rate	Current Revised Data	Real-Time Data	Blue Chip Forecast	Fed Policymaker Forecasts	Comb: Real Time and Blue Chip
Current Revised Data	<b>0.73</b>	(1.42)				
Real-Time Data	<b>0.87</b>	<b>0.82</b>	(1.04)			
Blue Chip Forecast	<b>0.84</b>	<b>0.67</b>	<b>0.92</b>	(1.16)		
Fed Policy-maker Forecasts	<b>0.82</b>	<b>0.67</b>	<b>0.91</b>	<b>0.99</b>	(1.23)	
Comb: Real Time and Blue Chip	<b>0.88</b>	<b>0.76</b>	<b>0.98</b>	<b>0.98</b>	<b>0.97</b>	(1.02)

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# Alternative Versions of the Taylor Rule

	Actual Fed Funds Rate	Current Revised Data	Real-Time Data	Blue Chip Forecast	Fed Policymaker Forecasts	Comb: Real Time and Blue Chip	Mean Error
Current Revised Data	<b>0.73</b>	(1.42)					-1.66
Real-Time Data	<b>0.87</b>	<b>0.82</b>	(1.04)				0.34
Blue Chip Forecast	<b>0.84</b>	<b>0.67</b>	<b>0.92</b>	(1.16)			0.15
Fed Policy-maker Forecasts	<b>0.82</b>	<b>0.67</b>	<b>0.91</b>	<b>0.99</b>	(1.23)		-0.03
Comb: Real Time and Blue Chip	<b>0.88</b>	<b>0.76</b>	<b>0.98</b>	<b>0.98</b>	<b>0.97</b>	(1.02)	0.24

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Right Column shows the mean error for each version of the Taylor Rule.

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- Green Book forecasts of inflation were much more accurate than the Blue Chip, but the Blue Chip was as good or a better match for the FOMC forecasts.
- In the period since 1994, the FOMC consensus has been more accurate than the Blue Chip consensus for both inflation and output, but not by much.