15. Which Rule for Monetary Policy?

John B. Taylor, May 22, 2013

Started Course with a Big Policy Issue: Competing Monetary Policies

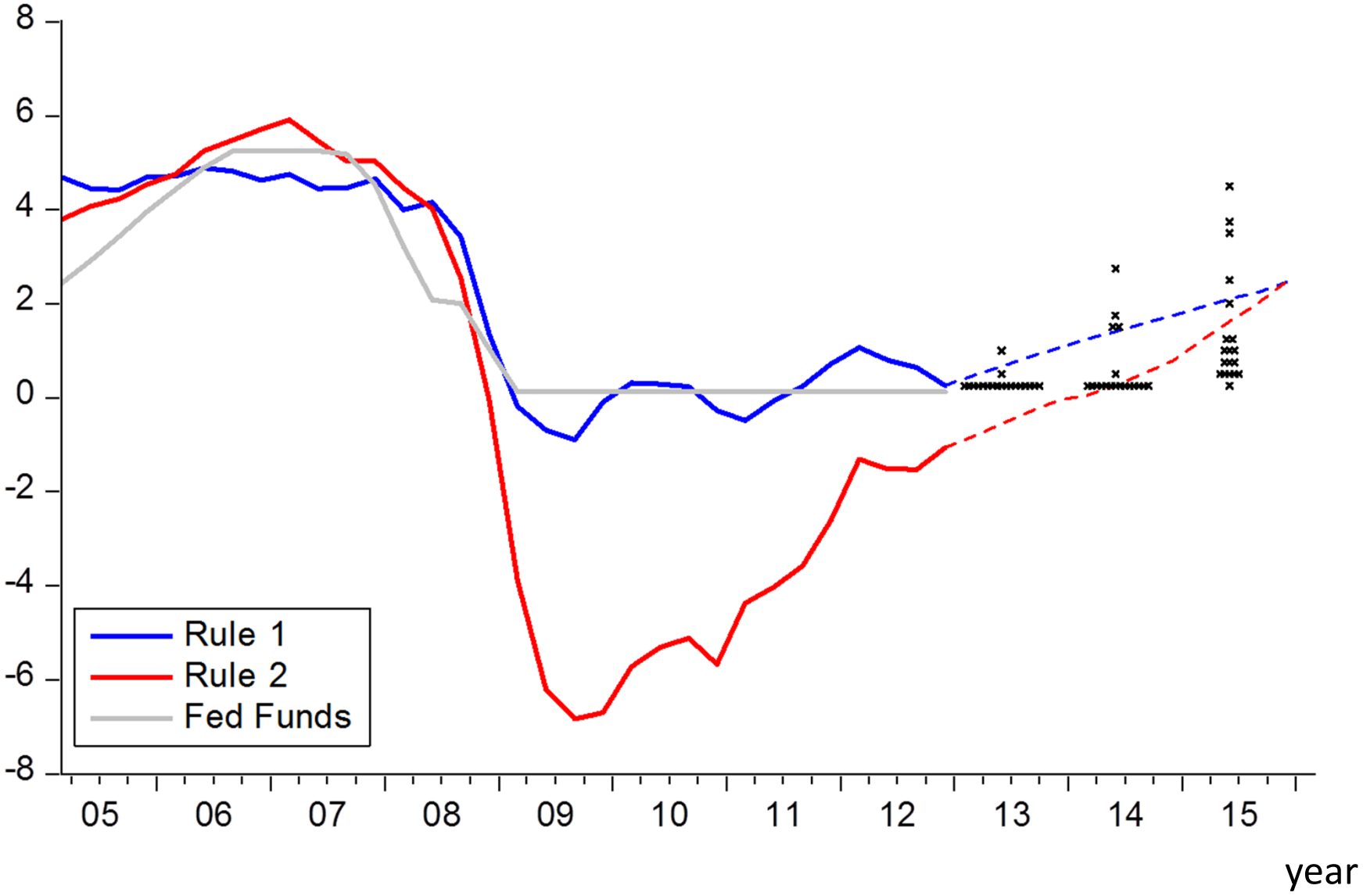
- Fed Vice Chair Yellen described these in her April 2012 paper, as discussed in the first lecture

$$\Rightarrow \quad R_t = 2 + \pi_t + 0.5(\pi_t - 2) + 0.5Y_t,$$

$$\Rightarrow \quad R_t = 2 + \pi_t + 0.5(\pi_t - 2) + 1.0Y_t$$

$$\text{with } Y_t = 2.3(5.6 - U_t),$$

- And they've been discussed for at least 10 years at the Fed, as evidenced by Jan 2002 meeting
- Though similar in some respects, the interest rate differences are huge:



and one gives a rationale for QE and forward guidance….

Testimony in Senate Banking Committee: March 1, 2011

MR. BERNANKE: ... The Taylor Rule suggests that we should be, in sense, way below zero in our interest rate, and ***therefore we need some method other than just normal interest rate changes*** to --

SEN. TOOMEY: Do you know if Mr. Taylor believes that?

MR. BERNANKE: Well, there are different versions of the Taylor Rule, and there's no particular reason to pick the one that he picked in 1993. In fact, he preferred a different one in 1999 which, if you use that one, gives you a much different answer.

SEN. TOOMEY: My understanding is that his view of his own rule is that it would call for a higher Fed funds rate than what we have now.

MR. BERNANKE: There are, again, many ways of looking at that rule, and I think that ones that look at history, ones that are justified by modeling analysis, many of them suggest that we should be well below zero. And I just would disagree that that's the only way to look at it. But anyway, so I think there are some -- there is some basis for doing that.

Compare and contrast the two policies. Which would you recommend? Explain using theory and facts from the course.

- There are many similarities
  - policies are rule-like
  - interest rate is the instrument
  - two variables affect policy decisions
  - weight on output is positive
  - weight on inflation is greater than one
  - both are simple rules
- There are two big differences;
  - The estimate of the output gap
  - The size of the coefficient on the gap
- So we must consider both of these in detail…

Differences in the size of the gap

- The second rule uses an Okun's law to get the gap
  - It uses a coefficient of 2.3
  - With U=8.1, the gap is thus 2.3(5.6-U) = -5.8
  - But this 2.3 coefficient is larger than empirically estimated values
  - Regression estimates find a coefficient of 1.5
    - see regression table
    - Using this regression the gap would be much smaller
      8.9-1.49(8.1) = -3.2
- In contrast, the first rule does not use the unemployment rate to estimate the output gap;
  - For example, consider the CBO estimate of the gap
    - This is also much smaller than the second rule
    - See chart
  - HP filtered estimate of the gap is even smaller

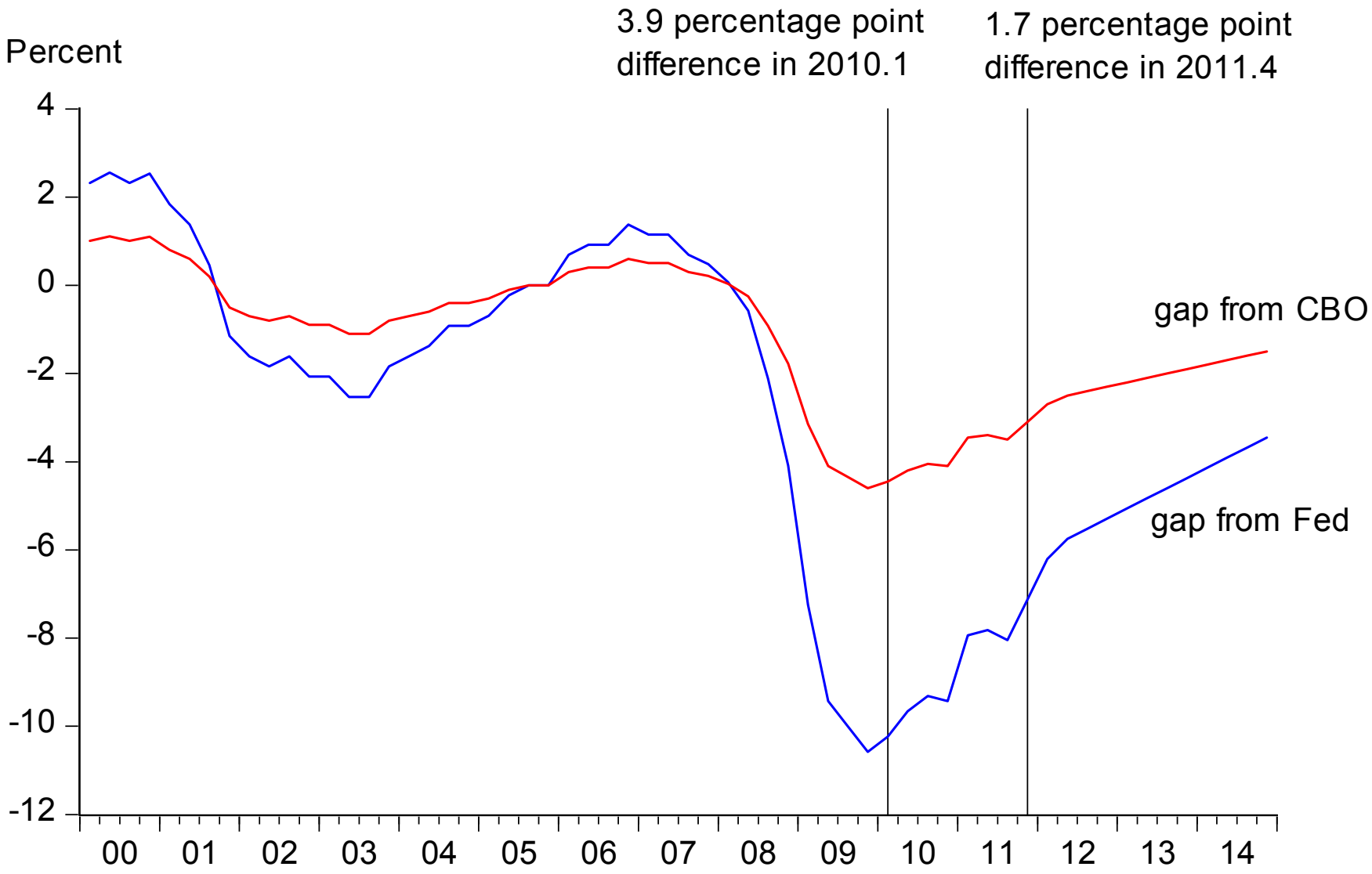
Okun's Law regression

Dependent Variable: CBO's estimate of output gap
Method: Least Squares
Sample: 1955Q1 - 2011Q4

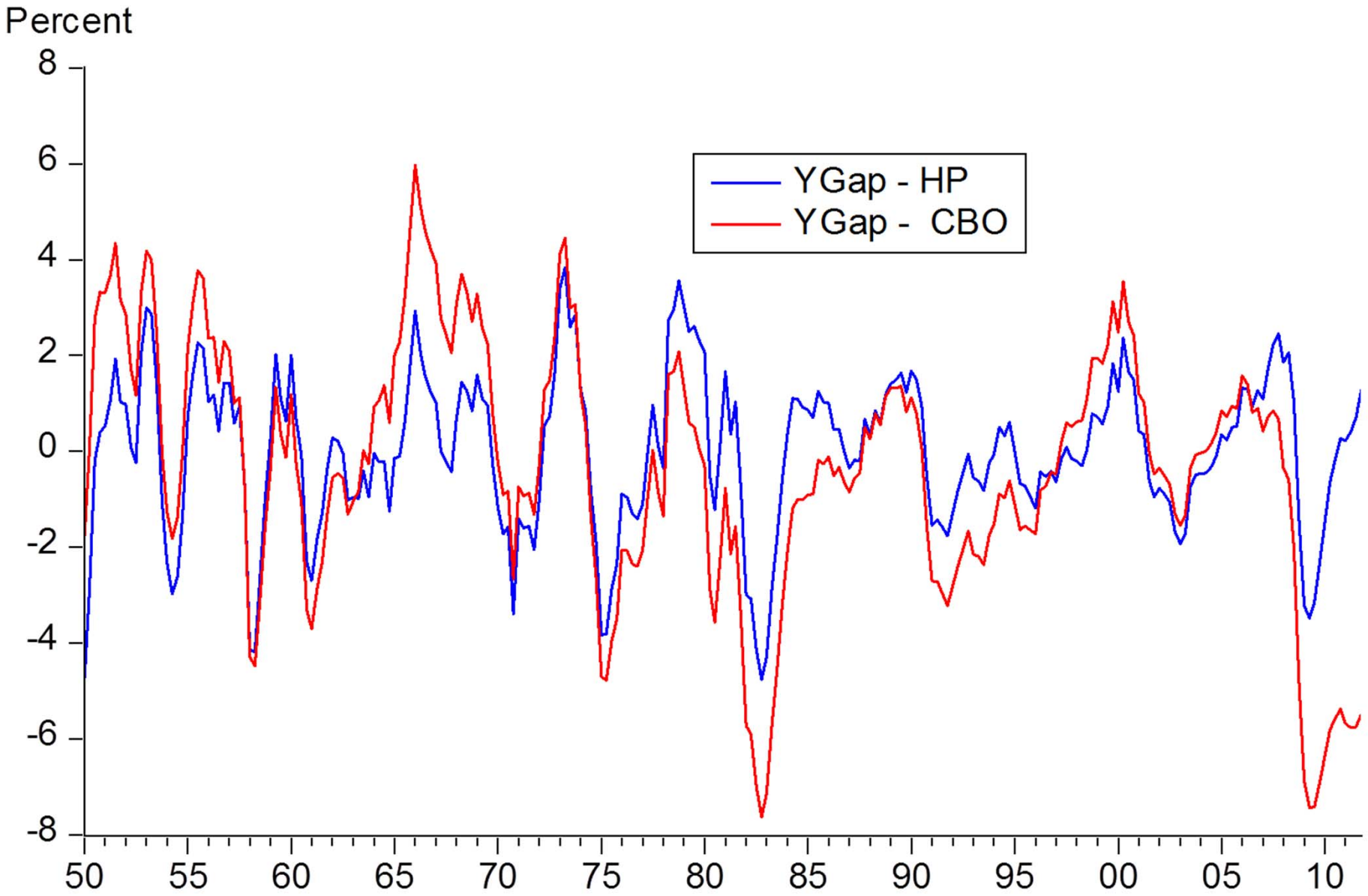
Variable	Coefficient	Std. Error
Constant	8.39	0.30
Unemployment Rate	-1.49	0.048

$R^2 = 0.81$
Mean of dependent variable = -0.48
S.D. of dependent variable = 2.64
S.E. of regression = 1.15
Durbin-Watson statistic = 0.32

Two estimates of the gap



Even bigger difference if you use HP filter to detrend!



(Slide 11, Lecture 2)

Thus the second rule seems to assume a gap which is too large. And here is more evidence

Table from "Update of 'How Big is the Output Gap?'" Justin Weidner and John C. Williams, July 7, 2011

Table 1.
Alternative estimates of output gap

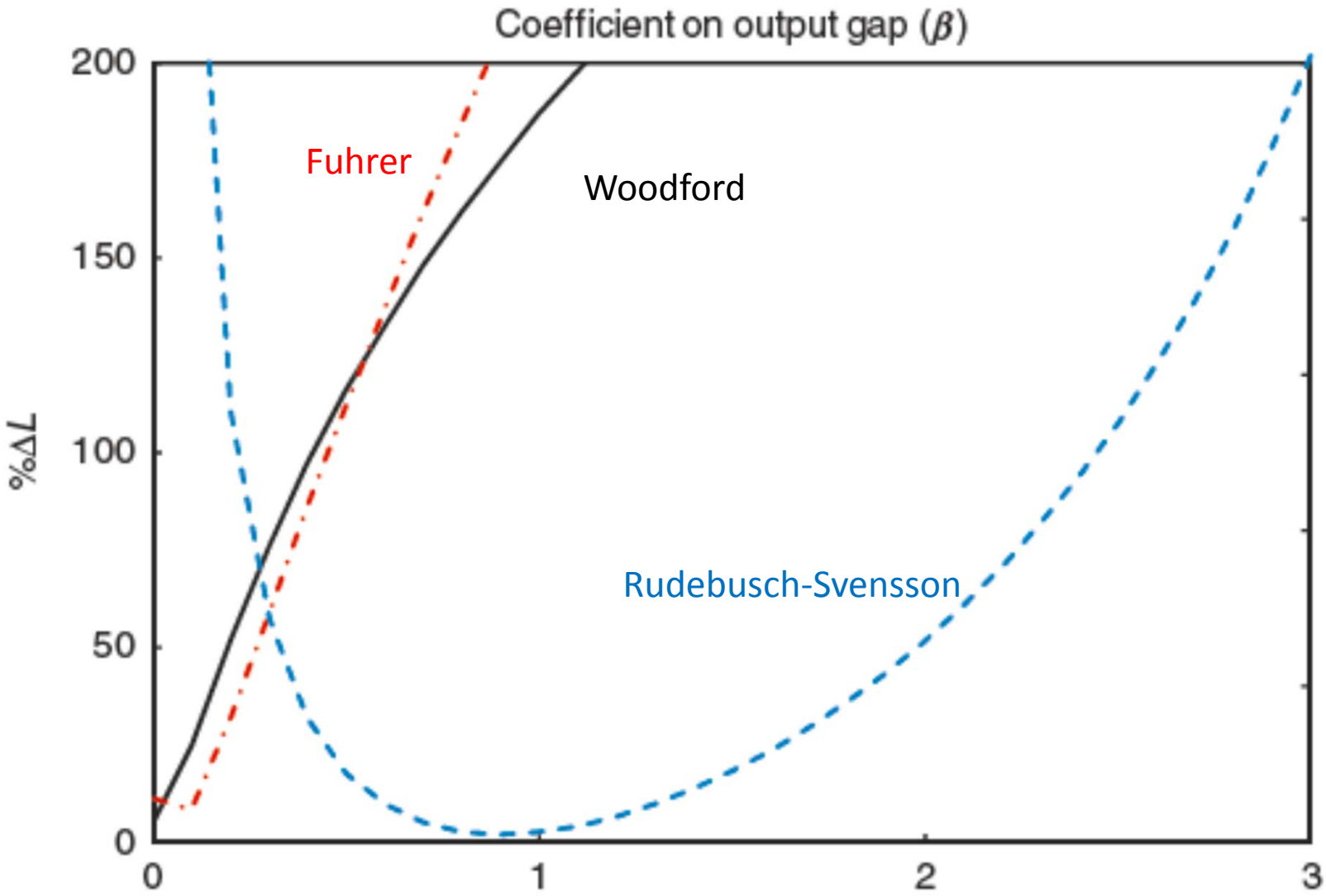
	2007Q4	2008Q4	2009Q4	2010Q1	2010Q2	2010Q3	2010Q4	2011Q1
1. CBO output-based	0.4	-4.6	-6.1	-5.7	-5.7	-5.5	-5.2	-5.2
2. Laubach-Williams	1.5	-1.7	-2.7	-2.3	-2.0	-1.8	-1.5	-1.3
3. Capacity utilization	0.5	-4.3	-5.6	-4.7	-3.6	-3.0	-2.6	-2.0
4. CBO unemployment-based	0.4	-3.0	-8.1	-7.7	-7.5	-7.4	-7.5	-6.3
5. Job market perceptions	-0.5	-3.6	-5.1	-4.8	-4.5	-4.7	-4.9	-4.6
6. Business survey	-0.6	-3.4	-6.0	-5.7	-5.6	-5.5	-5.2	-4.4
7. Job vacancies	0.6	-4.8	-7.7	-6.4	-5.4	-5.0	-4.7	-4.5
	0.483	-4.094	-10.58	-10.235	-9.66	-9.315	-9.43	-7.935

From Fed's unemployment based method

Also uncertain:
Standard deviation = 1.8

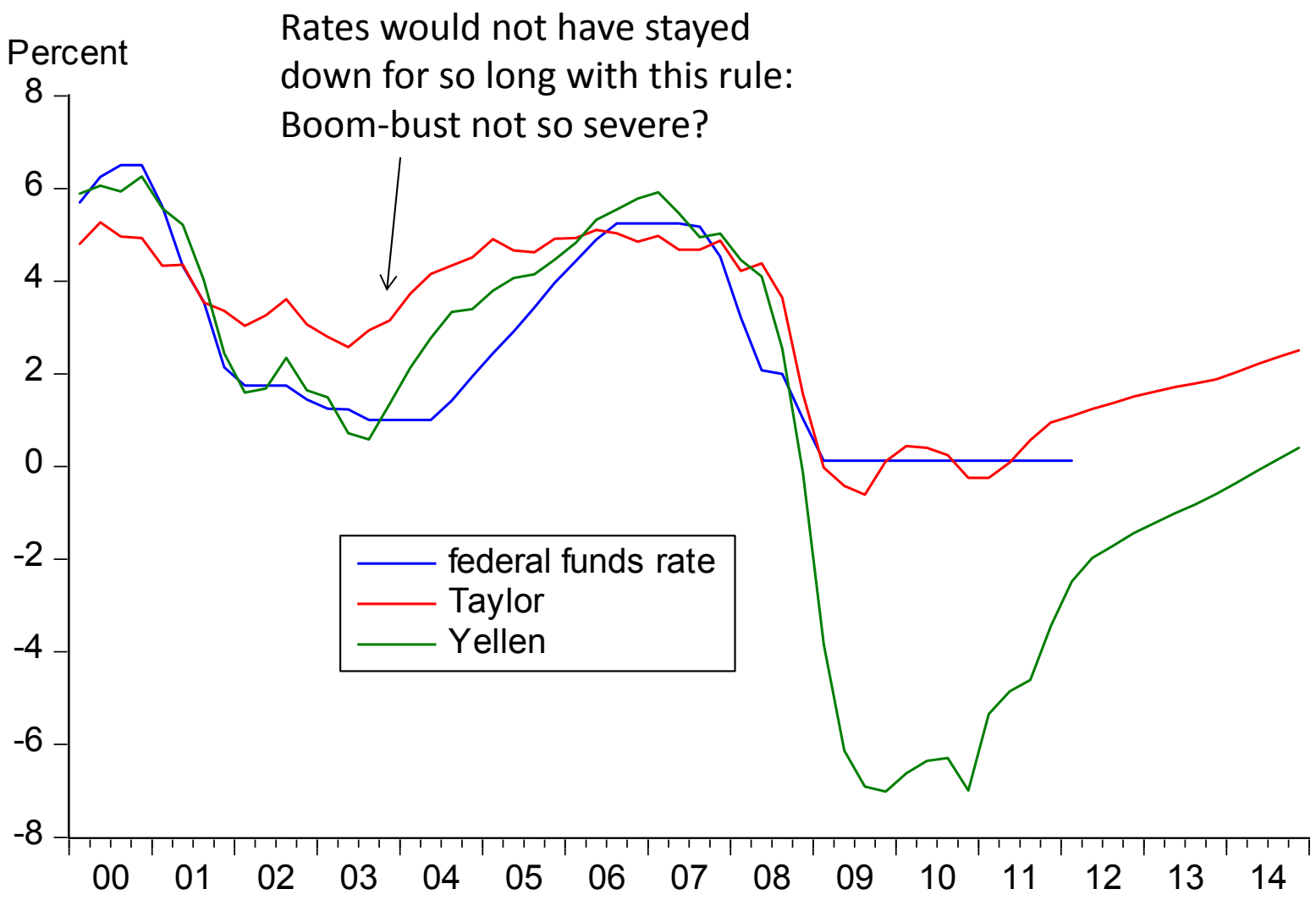
Difference in the coefficient on the gap 0.5 or 1.0?

- Smaller coefficient more robust; see charts in Taylor-Williams survey (Slide 7, Lecture 12)
- Experience from 2003-05 shows problems with larger coefficient on output (see evidence in chart)
- Smaller coefficient better because of output gap uncertainty
  - Potential GDP hard to measure
  - Examples from 1970s (Athanasios Orphanides)
  - Frank Smets' estimates
- You run into the lower bound less often with smaller coefficient
  - And thus unpredictable actions like QE occur less often
  - π=2 (rather than zero) is chosen to deal with the problem
  - In any case use "augmented rule" rather than QE
- Experience (e.g. Japan) shows that a downward spiraling deflation is not a problem in practice



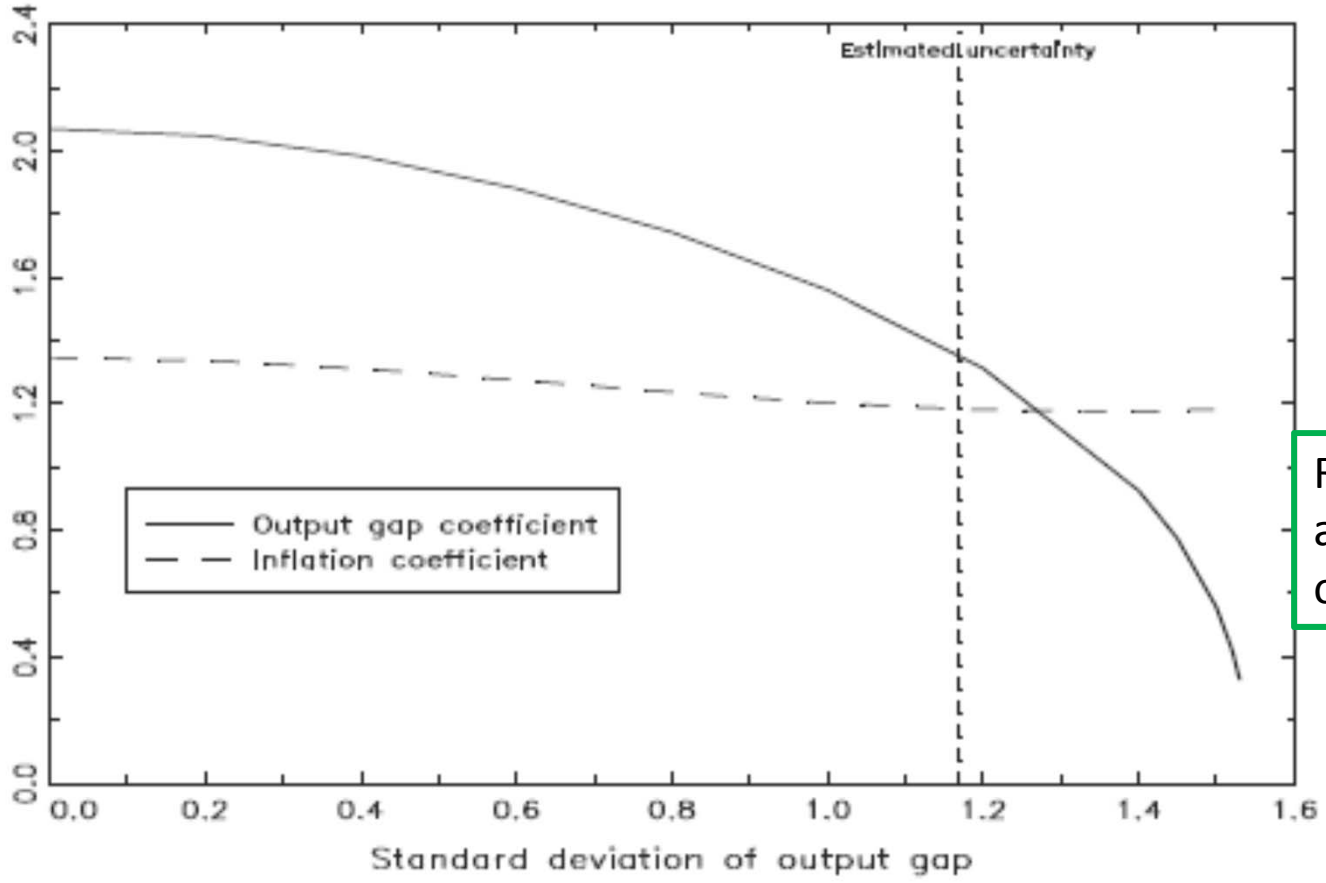
(Slide 7, Lecture 12)

Extension of DiClemente chart back to earlier years



Graph 4

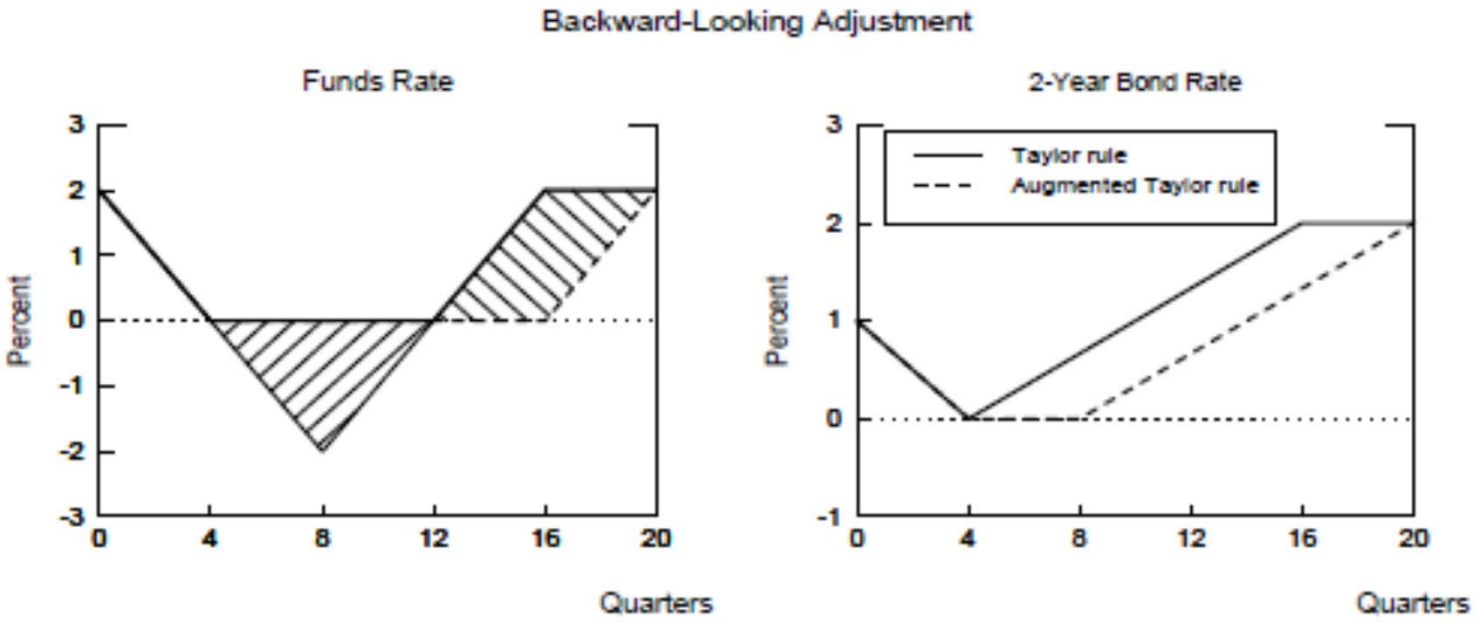
Taylor rule coefficients as function of output gap uncertainty

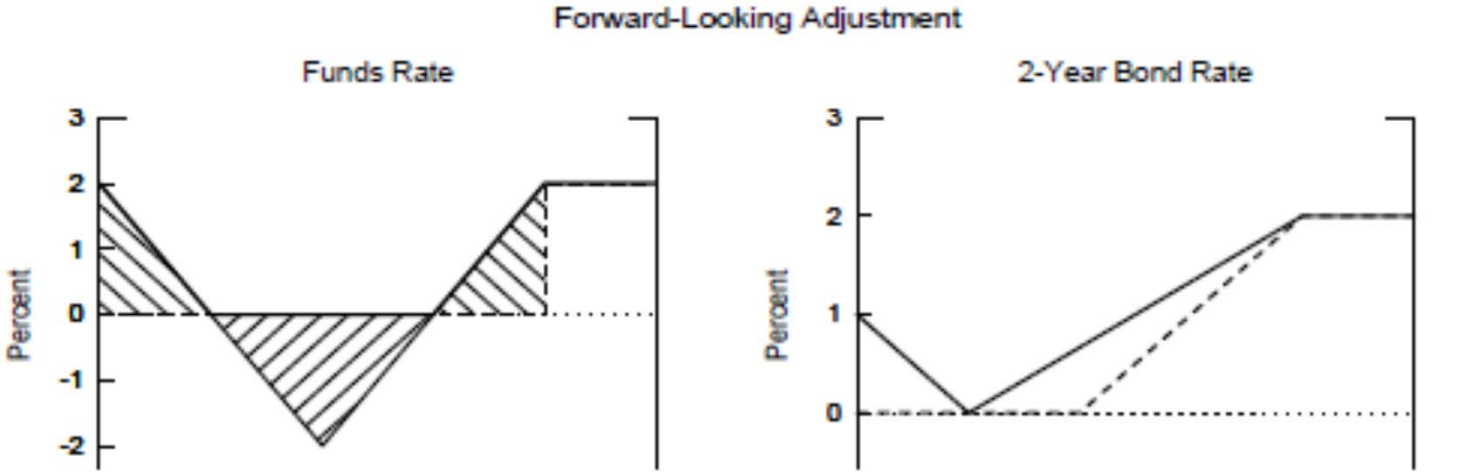


Recall S.D.1.8 across survey of estimates

Source: Frank Smets: "Output Gap Uncertainty: Does it Matter for the Taylor Rule" BIS Working Paper, No. 60, November 1998

Forward Guidance Explained Simply





Forward Guidance in Theory

Augmented rule for the zero lower bound :

$$i_t = \max(i_t^{rule} - \alpha Z_t, 0)$$

where

$$Z_t = d_t + d_{t-1} + d_{t-2} + d_{t-3} + \ldots$$

$$d_t = i_t - i_t^{rule}$$

Forward Guidance in Practice

First formulation

$i_t = 0$, if $t \leq 2015$

$i_t = ?$, if $t > 2015$

New formulation

$i_t = 0$, if $u_t \geq 6.5\%$ as long as $\pi_t \leq 2.5\%$

$i_t = ?$, *if* $u_t < 6.5\%$

One guess about ? or happens after zero is a return to either Rule 1 or Rule 2.
But there a time inconsistency problem

An alternative and much simpler approach would entail setting the federal funds rate according to the prescriptions of a policy rule, such as the well-known Taylor rule or a variant. Many studies have shown that, in normal times, when the economy is buffeted by typical shocks--not the extraordinary shock resulting from the financial crisis--simple rules can come pretty close to approximating optimal policies. …why shouldn't the FOMC adopt such a rule as a guidepost to policy? The answer is that times are by no means normal now, and the simple rules that perform well under ordinary circumstances just won't perform well with persistently strong headwinds restraining recovery and with the federal funds rate constrained by the zero bound.

Janet Yellen, November 2012

Conclusion

- The two policies share many characteristics
  - these are what economic theory and facts would recommend.
- Regarding the differences, theory and facts imply
  - a more robust (smaller now) estimate of the gap
  - a smaller coefficient on the gap
- Of course one could argue the other side and, if argued well, get a good grade!
- Two asides:
  - it's wonderful to have such an important and practical problem at the center of 1st year Ph.D. curriculum
  - Beware of wolves in sheep clothing, or, in this case, "discretion in rules clothing"