

Reconsidering the Fed's Forecasting Advantage

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Background

- Recent literature decomposes VAR identified monetary shocks into:
 - A classical monetary shock (a la CEE 1999)
 - An information shock where the Fed reveals info on the state of the economy through changes in the target
- Founded on a literature asserting the Fed has an informational advantage over the private sector
- Comparison of the GB to private sector forecasts generally yields two stylized facts:
 - ① Fed forecasts dominate private sector forecasts (particularly for inflation)
 - ② More recent studies find that the Fed's forecasting advantage has eroded
- What is the source of the Fed's forecasting advantage?

Information

- R/R (2000) and N/S (2018) implicitly assume that $p^f(\pi_{t+h}|\Omega_t^f) \neq p^p(\pi_{t+h}|\Omega_t^p)$ because either:
 - Ω_t^f subsumes Ω_t^p or
 - $p^f(\cdot|\cdot)$ dominates $p^p(\cdot|\cdot)$
- Sims (2002) is more specific:
 - Greenbook forecasts are made *conditional* on a policy path, $p(\pi_{t+h}|r_{t+k}, \Omega_t)$
 - Private sector forecasts must also predict the Fed, $p(\pi_{t+h}, r_{t+k}|\Omega_t)$
- R/R (2000) discount this, arguing that the timing is inconsistent with long and variable lags
- They do not, however, formally test this hypothesis

What do we do?

- We ask: Does the Fed's forecast advantage reflect an informational advantage?
- If so, does the Fed's informational advantage result in its knowledge of the path?

Conditional Encompassing

- Romer hypothesis:

We argue that the Federal Reserve's information advantage stems not from early access to government statistics or inside information about monetary policy, but rather from the vast resources it devotes to forecasting.

- Develop a *conditional* encompassing test based on IV to equalize information
 - Compares the Fed's (unobserved) unconditional forecasts to the private sector's (observed) unconditional forecasts
 - Instruments correlated with the unconditional forecast
 - Uncorrelated with the conditioning information

Testing Knowledge of the Path

- Is knowledge of the path the source of the informational advantage
- Partition the sample into forecast origins when the market also “knows” the conditioning path
 - Information is equivalent to the Fed's
 - Forecast performance should be the same
 - Can use conventional encompassing tests

What do we learn?

- Without correcting for conditioning, GB forecasts encompass BC forecasts
- After accounting for conditioning using IV, GB no longer encompasses BC
 - Suggests that equalizing the information sets eliminates the Fed's forecast advantage
- Moreover, when the market path knows the Fed's conditioning path, the Fed does not encompass
- Thus, we conclude that the majority of the Fed's forecasting advantage results from its knowledge of the path
- We then consider some implications of this result

Is the Fed's Advantage Informational?

Encompassing

- Given the Fed's forecast, BC provides no additional information
- Formally, run the regression:

$$\pi_{t+h} = \alpha + \beta_f \hat{\pi}_{t+h|t}^f + \beta_p \hat{\pi}_{t+h|t}^p + \varepsilon_{t+h},$$

- Test the null hypothesis that the Fed encompasses, $(\beta_f, \beta_p) = (1, 0)$
- The GB forecasts are constructed using a hypothetical path for monetary policy
- After 1994, the Fed became more transparent
- If the forecast advantage results from knowledge of the path, increased transparency may weaken

Data

- Forecasts from the GB, BC, SPF
- SPF forecasts are lower frequency creating timing issues with the GB
 - Focus on BC, use SPF as robustness
- Forecasted variables are GNP/GDP, inflation, unemployment rate
 - Focus on inflation
- Realizations are first final

Sample Break

- Full sample from 1965 to 2007 (or 2015)
- Impose a break in 1994
- R/R sample up to end of 1991 when GB changed from forecasting GNP to GDP
- Other studies find a break around the time of increased transparency
- Can compare results across the break

Conventional Encompassing Test Results

h	Pre 1994		
	β_p	β_f	χ^2
0	0.32 (0.10)	0.66 (0.04)	7.21 (0.03)
1	-0.22 (0.35)	1.12 (0.50)	2.06 (0.36)
2	-0.28 (0.27)	1.11 (0.61)	4.17 (0.12)
3	-0.35 (0.19)	1.22 (0.32)	2.54 (0.28)
4	-0.32 (0.25)	1.18 (0.55)	1.71 (0.43)
5	-0.23 (0.55)	0.93 (0.87)	3.44 (0.18)
6	0.48 (0.02)	0.03 (0.00)	32.87 (0.00)
7	0.29 (0.06)	0.10 (0.00)	29.63 (0.00)

Conventional Encompassing Test Results

h	Pre 1994		
	β_p	β_f	χ^2
0	0.32 (0.10)	0.66 (0.04)	7.21 (0.03)
1	-0.22 (0.35)	1.12 (0.50)	2.06 (0.36)
2	-0.28 (0.27)	1.11 (0.61)	4.17 (0.12)
3	-0.35 (0.19)	1.22 (0.32)	2.54 (0.28)
4	-0.32 (0.25)	1.18 (0.55)	1.71 (0.43)
5	-0.23 (0.55)	0.93 (0.87)	3.44 (0.18)
6	0.48 (0.02)	0.03 (0.00)	32.87 (0.00)
7	0.29 (0.06)	0.10 (0.00)	29.63 (0.00)

h	Post 1994		
	β_p	β_f	χ^2
0	0.20 (0.35)	0.60 (0.00)	17.53 (0.00)
1	0.02 (0.96)	0.48 (0.04)	10.64 (0.00)
2	-0.04 (0.92)	0.34 (0.02)	17.60 (0.00)
3	-0.16 (0.60)	0.24 (0.00)	27.28 (0.00)
4	-0.33 (0.19)	0.20 (0.00)	45.56 (0.00)
5	-0.03 (0.91)	-0.38 (0.00)	77.10 (0.00)
6	-0.24 (0.52)	-0.25 (0.00)	44.22 (0.00)
7	0.94 (0.01)	-0.85 (0.00)	29.36 (0.00)

Conditional encompassing

- In principle, we want to run the encompassing regression with unconditional forecasts
- But the Fed's unconditional forecast is unobserved
- The conditional forecast is the unconditional forecast $\pi_{t+h|t}^{f,u}$ plus a function of the difference between \widehat{r}_{t+i}^u and r_{t+i}^c
- Thus, we can treat $r_{t+i}^c - \widehat{r}_{t+i}^u$ as the time $t+i$ innovation to the policy rate equation
- Which suggests we can approximate $\pi_{t+h|t}^{f,u}$ via IV with instruments that are
 - Correlated with $\pi_{t+h|t}^{f,u}$
 - Uncorrelated with $r_{t+i}^c - \widehat{r}_{t+i}^u$
- For inflation, we can use the BC unemployment rate, GDP growth forecasts as instruments

Conditional Encompassing Test Results

h	Pre 1994		
	β_p	β_f	χ^2
0	0.51 (0.68)	0.46 (0.59)	7.88 (0.02)
1	-0.40 (0.45)	1.23 (0.63)	4.79 (0.09)
2	-0.45 (0.19)	1.20 (0.57)	7.95 (0.02)
3	-0.46 (0.22)	1.37 (0.36)	2.09 (0.35)
4	-0.28 (0.41)	0.99 (0.98)	7.97 (0.02)
5	-0.18 (0.64)	0.62 (0.35)	44.75 (0.00)
6	0.55 (0.04)	-0.04 (0.00)	23.50 (0.00)
7	0.46 (0.05)	-0.08 (0.00)	23.78 (0.00)

Conditional Encompassing Test Results

h	Pre 1994		
	β_p	β_f	χ^2
0	0.51 (0.68)	0.46 (0.59)	7.88 (0.02)
1	-0.40 (0.45)	1.23 (0.63)	4.79 (0.09)
2	-0.45 (0.19)	1.20 (0.57)	7.95 (0.02)
3	-0.46 (0.22)	1.37 (0.36)	2.09 (0.35)
4	-0.28 (0.41)	0.99 (0.98)	7.97 (0.02)
5	-0.18 (0.64)	0.62 (0.35)	44.75 (0.00)
6	0.55 (0.04)	-0.04 (0.00)	23.50 (0.00)
7	0.46 (0.05)	-0.08 (0.00)	23.78 (0.00)

h	Post 1994		
	β_p	β_f	χ^2
0	1.46 (0.39)	-0.56 (0.31)	2.11 (0.35)
1	2.71 (0.00)	-2.03 (0.00)	17.03 (0.00)
2	2.16 (0.08)	-1.86 (0.01)	13.23 (0.00)
3	0.61 (0.51)	-0.56 (0.08)	23.40 (0.00)
4	-0.34 (0.43)	0.21 (0.08)	44.61 (0.00)
5	-0.11 (0.74)	-0.30 (0.00)	70.35 (0.00)
6	-0.33 (0.38)	-0.16 (0.00)	49.49 (0.00)
7	0.58 (0.16)	-0.46 (0.00)	13.38 (0.00)

Equalizing Information

Background

- The IV result suggests that the Fed has an informational advantage
- If the information sets are equal, the private sector appears to forecast as well as the Fed
- IV not direct evidence that the informational advantage is knowledge of the path
- Next, identify periods when the market also “knows” the conditioning path
- In this case, we can separately test:
 - If the Fed encompasses when the private sector does not know the path
 - But does not encompass when the private sector knows the path

Defining the path

- When does the private sector know the path?
- We consider two aspects:
 - Does the market path coincide with the actual path?
 - Do forecasters have a threshold level of certainty?
- The short rate implied by the Eurodollar futures at various horizons measures “on the path”
- The MPU from Baker, Bloom and Davis measures “certainty”

Quantifying “on the path” and “certainty”

- At each forecast origin:
 - Compute the implied expected short rate for various forecast horizons
 - Compare the implied rates to the actual rates with tolerance that increases with horizon
- The market is considered on the path at time t for horizon h if
 - $r_{t+j}(1 + \tau)^j > \widehat{r}_{t+j|t}^{market} > r_{t+j}(1 - \tau)^j$ for all $j = 1, \dots, h$
- That is, the private sector’s path is within the range for all horizons up to the forecast horizon
- We assume certainty when the MPU is lower than the 60th percentile
- We can then interact on-the-path with certainty to obtain a measure of knowledge of the path

Monetary Policy Path Encompassing Test

h	Both on Path with Certainty & Both off Path/Uncertain				Fed on Path & Market off Path/Uncertain			
	β_p	β_f	χ^2	N	β_p	β_f	χ^2	N
0	0.25 (0.37)	0.76 (0.23)	1.55 (0.46)	42	0.09 (0.42)	0.74 (0.01)	11.64 (0.00)	149
1	-0.03 (0.86)	0.77 (0.23)	9.85 (0.01)	104	0.21 (0.25)	0.50 (0.05)	5.10 (0.08)	98
2	0.13 (0.50)	0.57 (0.09)	12.90 (0.00)	137	0.08 (0.74)	0.65 (0.35)	2.31 (0.32)	67
3	0.03 (0.88)	0.68 (0.22)	6.68 (0.04)	144	-0.03 (0.94)	0.58 (0.38)	3.76 (0.15)	57
4	0.05 (0.81)	0.66 (0.24)	6.25 (0.04)	157	0.18 (0.64)	0.48 (0.19)	2.24 (0.33)	46

The ZLB Period

The ZLB Path

- In the previous section, we used the market-expected short rate as an indicator of their knowledge of the path
- During the ZLB, comparing ED futures to the FFR might be misleading
- How can we identify market expectations of policy?
 - Naive
 - Shadow short rate
 - Balance sheet
 - Long rates
- To remain consistent with previous analysis, must be conditioning information in the GB

Path Encompassing (2016 Eurodollar)

h	Both on Path with Certainty & Both off Path/Uncertain				Fed on Path & Market off Path/Uncertain			
	β_p	β_f	χ^2	N	β_p	β_f	χ^2	N
0	0.37 (0.19)	0.53 (0.18)	6.62 (0.04)	93	0.09 (0.10)	0.75 (0.09)	13.51 (0.00)	164
1	0.27 (0.17)	0.46 (0.17)	22.96 (0.00)	169	0.22 (0.18)	0.50 (0.25)	5.04 (0.08)	99
2	0.37 (0.21)	0.34 (0.25)	15.69 (0.00)	202	0.06 (0.23)	0.66 (0.37)	2.68 (0.26)	68
3	0.15 (0.18)	0.54 (0.24)	8.94 (0.01)	209	-0.03 (0.36)	0.57 (0.48)	4.18 (0.12)	58
4	0.12 (0.20)	0.55 (0.27)	12.74 (0.00)	223	0.18 (0.38)	0.48 (0.39)	2.24 (0.33)	46

Path Encompassing (2016 10-year Futures)

h	Both on Path with Certainty & Both off Path/Uncertain				Fed on Path & Market off Path/Uncertain			
	β_p	β_f	χ^2	N	β_p	β_f	χ^2	N
0	0.34 (0.30)	0.52 (0.25)	5.62 (0.06)	68	0.16 (0.08)	0.70 (0.08)	16.80 (0.00)	184
1	0.23 (0.19)	0.49 (0.20)	18.94 (0.00)	148	0.26 (0.16)	0.51 (0.23)	4.95 (0.08)	113
2	0.29 (0.21)	0.41 (0.25)	17.44 (0.00)	182	0.22 (0.24)	0.51 (0.35)	2.78 (0.25)	82
3	0.13 (0.18)	0.56 (0.24)	8.65 (0.01)	191	0.03 (0.33)	0.55 (0.44)	6.52 (0.04)	69
4	0.11 (0.21)	0.55 (0.28)	12.92 (0.00)	204	0.16 (0.39)	0.51 (0.38)	3.27 (0.19)	57

Path Encompassing (2016 BC 10-year forecasts)

h	Both on Path with Certainty & Both off Path/Uncertain				Fed on Path & Market off Path/Uncertain			
	β_p	β_f	χ^2	N	β_p	β_f	χ^2	N
0	0.35 (0.29)	0.51 (0.27)	4.17 (0.12)	70	0.15 (0.11)	0.70 (0.09)	13.88 (0.00)	169
1	0.20 (0.17)	0.51 (0.18)	23.13 (0.00)	146	0.25 (0.16)	0.50 (0.23)	4.97 (0.08)	110
2	0.30 (0.20)	0.40 (0.25)	17.88 (0.00)	183	0.24 (0.25)	0.49 (0.36)	2.98 (0.23)	79
3	0.14 (0.18)	0.54 (0.24)	8.81 (0.01)	195	0.02 (0.33)	0.57 (0.45)	5.57 (0.06)	67
4	0.12 (0.21)	0.54 (0.28)	11.97 (0.00)	208	0.16 (0.39)	0.53 (0.37)	2.91 (0.23)	55

Macro Implications

Implications

- So...why do we care?
- R/R, N/S, others conclude that the Fed has an informational advantage
- Consisting of more/better data and/or more/better resources
- Has led to alternative identification schemes for monetary shocks where one can disentangle
 - The (endogenous) information channel innovation
 - The pure monetary shock
- With the idea that the pure monetary shock is contractionary and noninflationary

Conclusions

- Our results also may have implications for transparency/forward guidance
- Results suggests that increased transparency aids private sector forecasting
- Is this true at an individual level?
- Blue Chip individual forecasts are made each month for current and next year
- This makes the horizon information problematic
- SPF are available at a lower frequency but more standard horizons

Extra Slides

Monetary Policy Path Encompassing Test

h	Both on Path & Both off Path				Fed on Path & Market off Path			
	β_p	β_f	χ^2	N	β_p	β_f	χ^2	N
0	0.00 (0.99)	0.81 (0.15)	4.39 (0.11)	92	0.14 (0.28)	0.69 (0.00)	12.00 (0.00)	114
1	-0.05 (0.78)	0.83 (0.37)	5.88 (0.05)	109	0.26 (0.15)	0.44 (0.03)	6.15 (0.05)	90
2	0.07 (0.70)	0.65 (0.14)	12.15 (0.00)	140	0.02 (0.95)	0.70 (0.48)	2.92 (0.23)	62
3	0.02 (0.90)	0.69 (0.19)	6.68 (0.04)	148	-0.02 (0.95)	0.56 (0.40)	4.10 (0.13)	52
4	0.09 (0.64)	0.61 (0.13)	6.95 (0.03)	160	0.10 (0.82)	0.54 (0.29)	2.15 (0.34)	42

Conventional Encompassing Test Inflation through 2016

h	Pre 1994		
	β_p	β_f	χ^2
0	0.32 (0.20)	0.67 (0.16)	7.21 (0.03)
1	-0.22 (0.24)	1.12 (0.18)	2.06 (0.36)
2	-0.28 (0.25)	1.11 (0.21)	4.17 (0.12)
3	-0.35 (0.26)	1.22 (0.23)	2.54 (0.28)
4	-0.32 (0.28)	1.18 (0.29)	1.71 (0.43)
5	-0.23 (0.37)	0.93 (0.43)	3.44 (0.18)
6	0.48 (0.19)	0.03 (0.21)	32.87 (0.00)
7	0.29 (0.15)	0.10 (0.20)	29.63 (0.00)

Conventional Encompassing Test Inflation through 2016

h	Pre 1994		
	β_p	β_f	χ^2
0	0.32 (0.20)	0.67 (0.16)	7.21 (0.03)
1	-0.22 (0.24)	1.12 (0.18)	2.06 (0.36)
2	-0.28 (0.25)	1.11 (0.21)	4.17 (0.12)
3	-0.35 (0.26)	1.22 (0.23)	2.54 (0.28)
4	-0.32 (0.28)	1.18 (0.29)	1.71 (0.43)
5	-0.23 (0.37)	0.93 (0.43)	3.44 (0.18)
6	0.48 (0.19)	0.03 (0.21)	32.87 (0.00)
7	0.29 (0.15)	0.10 (0.20)	29.63 (0.00)

h	Post 1994		
	β_p	β_f	χ^2
0	0.21 (0.21)	0.60 (0.11)	17.36 (0.00)
1	0.14 (0.37)	0.38 (0.21)	15.95 (0.00)
2	0.10 (0.42)	0.22 (0.27)	21.12 (0.00)
3	0.01 (0.33)	0.11 (0.26)	29.38 (0.00)
4	-0.19 (0.25)	0.10 (0.26)	46.12 (0.00)
5	-0.17 (0.26)	-0.25 (0.27)	72.16 (0.00)
6	-0.35 (0.34)	-0.15 (0.33)	43.49 (0.00)
7	0.74 (0.33)	-0.66 (0.43)	16.01 (0.00)

Conditional Encompassing Test Inflation through 2016

h	Pre 1994		
	β_p	β_f	χ^2
0	0.51 (1.20)	0.46 (1.00)	7.88 (0.02)
1	-0.40 (0.53)	1.23 (0.48)	4.79 (0.09)
2	-0.45 (0.34)	1.20 (0.35)	7.95 (0.02)
3	-0.46 (0.37)	1.37 (0.40)	2.09 (0.35)
4	-0.28 (0.34)	0.99 (0.37)	7.97 (0.02)
5	-0.18 (0.37)	0.62 (0.40)	44.75 (0.00)
6	0.55 (0.26)	-0.04 (0.30)	23.50 (0.00)
7	0.46 (0.22)	-0.08 (0.30)	23.78 (0.00)

Conditional Encompassing Test Inflation through 2016

Pre 1994			
h	β_p	β_f	χ^2
0	0.51 (1.20)	0.46 (1.00)	7.88 (0.02)
1	-0.40 (0.53)	1.23 (0.48)	4.79 (0.09)
2	-0.45 (0.34)	1.20 (0.35)	7.95 (0.02)
3	-0.46 (0.37)	1.37 (0.40)	2.09 (0.35)
4	-0.28 (0.34)	0.99 (0.37)	7.97 (0.02)
5	-0.18 (0.37)	0.62 (0.40)	44.75 (0.00)
6	0.55 (0.26)	-0.04 (0.30)	23.50 (0.00)
7	0.46 (0.22)	-0.08 (0.30)	23.78 (0.00)

Post 1994			
h	β_p	β_f	χ^2
0	3.06 (3.74)	-1.87 (3.22)	1.35 (0.51)
1	1.72 (0.55)	-1.04 (0.49)	18.08 (0.00)
2	1.96 (1.32)	-1.65 (1.18)	12.12 (0.00)
3	0.21 (0.87)	-0.09 (0.87)	18.78 (0.00)
4	-0.73 (0.45)	0.65 (0.48)	31.82 (0.00)
5	-0.65 (0.46)	0.26 (0.50)	45.55 (0.00)
6	-0.98 (0.63)	0.54 (0.59)	21.28 (0.00)
7	-0.28 (0.75)	0.780.46 ()	3.93 (0.14)

Monetary Policy Path Encompassing Test through 2016 Eurodollar

h	Both on Path & Both off Path				Fed on Path & Market off Path			
	β_p	β_f	χ^2	N	β_p	β_f	χ^2	N
0	0.18 (0.15)	0.62 (0.16)	10.26 (0.01)	143	0.13 (0.12)	0.71 (0.09)	13.17 (0.00)	129
1	0.27 (0.18)	0.50 (0.18)	15.17 (0.00)	174	0.27 (0.17)	0.43 (0.25)	6.08 (0.05)	91
2	0.31 (0.20)	0.42 (0.24)	14.14 (0.00)	205	0.00 (0.25)	0.71 (0.42)	3.47 (0.18)	63
3	0.14 (0.16)	0.56 (0.21)	9.46 (0.01)	213	-0.03 (0.39)	0.54 (0.53)	4.51 (0.11)	53
4	0.16 (0.19)	0.50 (0.24)	14.60 (0.00)	226	0.10 (0.42)	0.54 (0.43)	2.15 (0.34)	42

Monetary Policy Path Encompassing Test through 2016 10 year Futures

h	Both on Path & Both off Path				Fed on Path & Market off Path			
	β_p	β_f	χ^2	N	β_p	β_f	χ^2	N
0	0.12 (0.19)	0.65 (0.18)	11.71 (0.00)	122	0.22 (0.09)	0.65 (0.08)	19.42 (0.00)	147
1	0.19 (0.19)	0.56 (0.21)	11.54 (0.00)	151	0.30 (0.15)	0.46 (0.22)	5.91 (0.05)	105
2	0.22 (0.19)	0.50 (0.23)	15.84 (0.00)	184	0.17 (0.26)	0.55 (0.38)	3.02 (0.22)	77
3	0.12 (0.16)	0.58 (0.21)	9.11 (0.01)	194	0.03 (0.35)	0.53 (0.48)	6.69 (0.04)	64
4	0.14 (0.19)	0.51 (0.25)	14.18 (0.00)	206	0.07 (0.43)	0.59 (0.42)	3.41 (0.18)	53

Monetary Policy Path Encompassing Test through 2016 BC 10 year forecasts

h	Both on Path & Both off Path				Fed on Path & Market off Path			
	β_p	β_f	χ^2	N	β_p	β_f	χ^2	N
0	0.15 (0.15)	0.62 (0.16)	12.78 (0.00)	144	0.16 (0.12)	0.69 (0.10)	11.87 (0.00)	121
1	0.18 (0.17)	0.56 (0.18)	16.05 (0.00)	154	0.32 (0.16)	0.41 (0.24)	5.97 (0.05)	99
2	0.24 (0.19)	0.47 (0.24)	18.11 (0.00)	190	0.19 (0.28)	0.54 (0.40)	2.42 (0.30)	71
3	0.13 (0.16)	0.55 (0.21)	10.26 (0.01)	203	0.03 (0.36)	0.56 (0.50)	4.37 (0.11)	59
4	0.15 (0.19)	0.50 (0.25)	13.62 (0.00)	215	0.08 (0.43)	0.59 (0.41)	3.16 (0.21)	48

Decomposition

		$h = 0$	$h = 1$	$h = 2$	$h = 3$	$h = 4$
(1)	R	-0.32 (0.12)	-0.29 (0.12)	-0.41 (0.14)	-0.57 (0.16)	-0.76 (0.18)
(2)	$\lambda_p[E(s_f) - E(s_p)]$	-0.12 (0.04)	-0.15 (0.05)	-0.11 (0.05)	-0.20 (0.08)	-0.27 (0.09)
(5)	policy path SFE	-0.06 (0.03)	-0.11 (0.04)	-0.12 (0.04)	-0.19 (0.07)	-0.26 (0.09)
	(5)/(1)	0.18	0.38	0.28	0.34	0.35
	(5)/(2)	0.47	0.75	1.06	0.94	0.99