

# Fiscal Policy: Ex Ante and Ex Post

Dean Croushore<sup>1</sup>    Simon van Norden<sup>2</sup>

<sup>1</sup>University of Richmond

<sup>2</sup>HEC Montréal & CIRANO

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Other Forecasts

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Forecast Performance  
Forecast Bias  
Forecast Reliability  
Policy Rules  
Fiscal Policy  
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# Overview I

## We construct and analyse a new data set for US Fiscal Policy

- ▶ Federal Government
  - ▶ Expenditures
  - ▶ Revenues
  - ▶ Surplus
  - ▶ Structural Surplus
- ▶ Real-Time
  - ▶ 2 vintages per quarter
  - ▶ Several quarters of forecasts and backcasts
  - ▶ Last vintage: end 2006
  - ▶ Vintages start around 1970s
- ▶ A real-time perspective over several business cycles.
- ▶ Consistent estimates of Actual and Structural Surpluses.

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# Overview II

We draw some lessons from the data



- ▶ Fiscal Forecast Quality Varies
  - ▶ Receipt forecasts biased – over-optimistic
  - ▶ Expenditure forecasts more reliable
  - ▶ ~~Worse~~ after start of The Great Moderation
- ▶ Fiscal Policy Intent
  - ▶ Fiscal policy seems more counter-cyclical since 1990.
- ▶ Taylor Rules
  - ▶ The Fed seems to lean against expected fiscal policy.



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# FOMC Greenbook Forecasts I

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## Board Staff Projections

- ▶ FOMC meetings from July 1966 to December 2006
- ▶ Use first & last meeting of each quarter

## Fiscal forecasts for federal government and macroeconomic variables

- ▶ Receipts
- ▶ Expenditures
- ▶ Surplus/Deficit
- ▶ High-employment budget (HEB)
- ▶ Current (consumption) and capital account surplus (since 1996)
- ▶ Unemployment rate
- ▶ Nominal and Real GDP (GNP before 1992)

## Fiscal variables converted to nominal GDP Shares

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STAFF PROJECTIONS OF FEDERAL SECTOR ACCOUNTS AND RELATED ITEMS  
(Billions of dollars except as noted)

January 29, 1997

Item	Fiscal year <sup>5</sup>				1996				1997				1998					
	1995*		1996*		Q1*	Q2*	Q3*	Q4	Not seasonally adjusted				Seasonally adjusted, annual rate					
	1995*	1996*	1997	1998					1995*	1996*	1997	1998	1995*	1996*	1997	1998		
<b>UNIFIED BUDGET</b>																		
Receipts <sup>1</sup>	1355	1453	1525	1575	322	446	362	346	341	459	380	363	351	469	392	382		
Outlays <sup>1</sup>	1319	1560	1634	1692	393	392	395	405	412	408	410	426	419	424	422	471		
Surplus/deficit <sup>1</sup>	-164	-107	-109	-117	-72	54	-33	-59	-71	51	-31	-63	-68	45	-30	-89		
Off-budget	-226	-174	-184	-187	-84	14	-36	-76	-83	13	-36	-72	-81	2	-36	-101		
Off-budget deposit insurance <sup>2</sup>	62	67	75	69	12	39	2	18	12	40	5	8	12	43	6	11		
Surplus excluding deposit insurance <sup>2</sup>	-182	-116	-118	-120	-75	52	-34	-65	-72	51	-32	-64	-69	44	-31	-90		
Means of financing																		
Borrowing	171	130	118	146	80	-23	39	49	58	-31	43	54	69	-25	48	73		
Cash decrease	-2	-6	4	0	-1	-16	-6	11	13	-16	-4	10	10	-15	-5	10		
Other <sup>3</sup>	-5	-16	-13	-29	-7	14	0	-1	1	-5	-8	0	-11	-5	-13	6		
Cash operating balance, end of period	38	44	40	40	22	38	44	33	20	36	40	30	20	35	40	30		
<b>NIPA FEDERAL SECTOR</b>																		
					Seasonally adjusted, annual rate													
Receipts	1459	1544	1625	1684	1523	1576	1582	1625	1606	1626	1645	1663	1672	1691	1711	1731		
Expenditures	1629	1683	1749	1798	1678	1702	1703	1730	1741	1755	1772	1782	1792	1802	1815	1829		
Consumption expend	455	457	462	463	454	464	461	463	460	461	464	463	464	462	464	460		
Defense	304	303	303	305	299	307	305	306	301	302	304	305	306	303	305	303		
Nondefense	151	155	159	158	155	156	157	157	159	160	160	157	158	159	159	157		
Other expenditures	1175	1226	1287	1335	1245	1239	1241	1267	1281	1294	1308	1319	1328	1340	1351	1369		
Current account surplus	-171	-139	-124	-114	-155	-127	-121	-105	-135	-128	-127	-119	-120	-112	-104	-98		
Gross investment	65	63	62	62	65	66	64	64	61	62	62	63	62	61	61	60		
Current and capital account surplus	-236	-202	-186	-176	-220	-193	-185	-169	-196	-190	-189	-182	-182	-172	-166	-159		
<b>FISCAL INDICATORS<sup>4</sup></b>																		
High-employment (HEB) surplus/deficit	-263	-237	-245	-249	-247	-233	-231	-222	-251	-251	-254	-253	-253	-247	-244	-241		
Change in HEB, percent of potential GDP	0	-4	1	1	1	-2	0	-1	4	0	0	0	0	-1	0	0		
Fiscal impetus (FI), percent, cal year	-5.6	-1.6	-3.5	-5.5	1.3	1.8	-2	-8	-2.2	-5	1	-2.7	-1.8	-1.3	-3	-2		

1 OMB's July 1996 deficit estimates (assuming the enactment of the President's proposals) are \$126 billion in FY97 and \$94 billion in FY98. CBO's January 1997 baseline deficit estimates are \$134 billion in FY97 and \$120 billion in FY98. Budget receipts, outlays, and surplus/deficit include corresponding Social Security (OASDI) categories. The OASDI surplus is excluded from the on-budget deficit and shown separately as off-budget, as classified under current law. The Postal Service deficit is included in off-budget outlays beginning in FY90.

2 OMB's July 1996 deficit estimates (assuming the enactment of the President's proposals), excluding deposit insurance spending, are \$134 billion in FY97 and \$96 billion in FY98. CBO's January 1997 baseline deficit estimates, excluding deposit insurance, are \$136 billion in FY97 and \$124 billion in FY98.

3 Other means of financing are checks issued less checks paid, accrued items, and changes in other financial assets and liabilities.

4 HEB is the NIPA current and capital account surplus in current dollars, with cyclically sensitive receipts and outlays adjusted to the level of potential output generated by 1.8 percent real growth and an associated unemployment rate of 6 percent. Quarterly figures for change in HEB and FI are not at annual rates. Change in HEB, as a percent of nominal potential GDP, is reversed in sign. FI is the weighted difference of discretionary changes in federal spending and taxes (in chained (1992) dollars), scaled by real federal consumption plus investment. For change in HEB and FI, negative values indicate restraint.

5 Fiscal 1995 data for the unified budget come from OMB, fiscal 1996 and quarterly data come from the Monthly Treasury Statement and may not sum to OMB fiscal year totals.

s=Actual

# FOMC Greenbook Forecasts III

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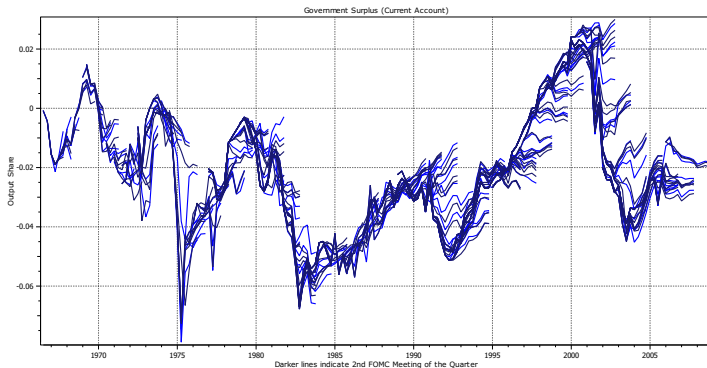
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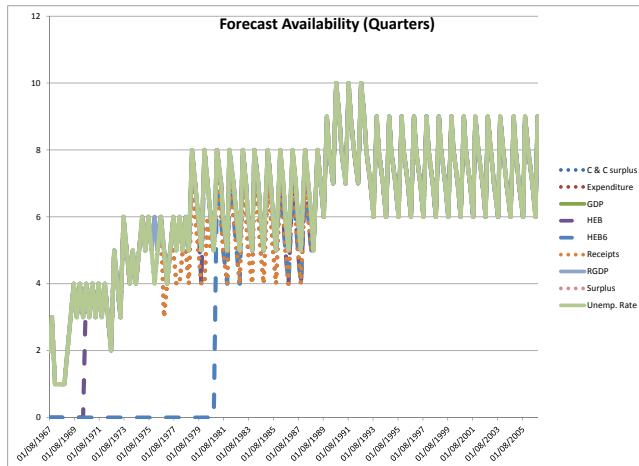
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# FOMC vs Other Fiscal Forecasts

Few standard data sets of US fiscal forecasts

- ▶ CBO forecasts are conditional on current law
- ▶ OMB, ERP are viewed as partisan
- ▶ Documented forecast bias and inefficiency  
e.g. Kleisen-Thornton (2012), Croushore-Hunt (2008),  
Auerbach (1994, 1999), Campbell-Ghysels (1995),  
Plesko (1988); not biased: Belongia (1988)

FOMC Greenbook forecasts offer several differences

- ▶ Expected Fiscal Policy
- ▶ Non-partisan internal forecasts  
5-year embargo
- ▶ Good forecast performance on main macro variables
- ▶ Long time span (many business cycles)
- ▶ Forecast and estimated Structural Deficits

Major Disadvantage: Short Forecast Horizons

# Forecast Bias?



We perform standard tests for forecast bias at 0-4Q horizons.

## Unemployment

- ▶ Significant bias at some horizons
- ▶ Consistent with poor record in 1970s and early 1980s

## Expenditures

- ▶ Bias only at horizon 0

## Receipts

- ▶ Significantly over-optimistic on average
- ▶ Particularly in late 1990s and early 2000s.

## Surplus

- ▶ No evidence of bias

## HEB

- ▶ Significant bias at most horizons
- ▶ However HEB6 shows no significant bias
- ▶ HEB6 assumes a constant 6% unemployment rate from 1980 onwards

# Forecast Reliability

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Table: Forecast Error Variance

Horizon	Expenditures	Receipts	Surplus	C&C Surplus	HEB	HEB6	Unemployment
1974Q4-1990Q4							
0L	0.047	0.075	0.056		0.179	0.141	0.008
0F	0.084	0.129	0.127		0.256	0.146	0.042
1L	0.105	0.189	0.181		0.314	0.152	0.067
1F	0.167	0.194	0.256		0.319	0.139	0.122
2L	0.149	0.330	0.284		0.413	0.117	0.155
2F	0.212	0.328	0.339		0.406	0.111	0.190
3L	0.197	0.173	0.196		0.383	0.143	0.229
3F	0.240	0.214	0.257		0.420	0.144	0.243
4L	0.221	0.207	0.206		0.448	0.093	0.315
4F	0.269	0.250	0.285		0.630	0.137	0.321
1991Q1-2006Q4							
0L	0.049	0.129	0.055	0.091	0.210		0.003
0F	0.059	0.141	0.074	0.114	0.243		0.011
1L	0.067	0.179	0.118	0.161	0.329		0.015
1F	0.069	0.228	0.132	0.159	0.314		0.030
2L	0.101	0.403	0.258	0.273	0.464		0.037
2F	0.118	0.421	0.291	0.288	0.451		0.054
3L	0.169	0.609	0.447	0.415	0.591		0.064
3F	0.195	0.630	0.491	0.450	0.586		0.098
4L	0.260	0.832	0.684	0.605	0.769		0.115
4F	0.304	0.844	0.750	0.667	0.786		0.154

Figures are fractions of the variance of the underlying series 1974Q4-2006Q4.

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# The Fiscal Policy Rule: Ex Post

Estimate by OLS

$$\Delta HEB_t = \phi_0 + \phi_{HEB} \cdot HEB_{t-1} + \phi_U \cdot U_t + e_t$$

Sample	1970Q2-2006Q4	1970Q2-1990Q4	1991Q1-2006Q4
$\phi_0$	0.004 ( 2.124)	0.006 ( 1.894)	0.009 ( 2.933)
$\phi_{HEB}$	-0.101 ( -2.913)	-0.099 ( -2.200)	-0.250 ( -4.471)
$\phi_U$	-0.096 ( -3.081)	-0.116 ( -2.462)	-0.262 ( -3.780)
$R^2$	0.094	0.101	0.180
$\phi_U/\phi_{HEB}$	0.951	1.177	1.050

Figures in parentheses are t-ratios based on Newey-West standard errors calculated with 4 lags.

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# The Fiscal Policy Rule: Ex Ante

Now estimate

$$\Delta HEB_t = \phi_0 + \phi_{HEB} \cdot HEB_{t-1} + \phi_U \cdot U_t \\ + \psi_U \cdot (\hat{U}_{t|t-4} - U_t) + \psi_{HEB} \cdot (\hat{HEB}_{t|t-4} - HEB_t) + e_t$$

Sample	1970Q2-2006Q4	1970Q2-1990Q4	1991Q1-2006Q4
$\phi_0$	-0.001 ( -0.625)	-0.001 ( -0.269)	0.009 ( 1.792)
$\phi_{HEB}$	-0.094 ( -2.747)	-0.054 ( -1.927)	-0.312 ( -3.839)
$\phi_U$	-0.001 ( -0.012)	0.015 ( 0.240)	-0.260 ( -2.582)
$\psi_U$	0.153 ( 1.439)	0.262 ( 1.634)	-0.241 ( -2.101)
$\psi_{HEB}$	-0.204 ( -3.710)	-0.266 ( -2.550)	-0.219 ( -3.827)
$R^2$	0.300	0.356	0.404
<b>Multipliers</b>			
$\phi_U/\phi_{HEB}$	0.005	-0.270	0.834
$\psi_U/\phi_{HEB}$	-1.628	-4.855	0.772
$\psi_{HEB}/\phi_{HEB}$	2.172	4.936	0.704

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# Taylor Rules and Fiscal Policy I

Our generalized Taylor rule is:

$$i_t = \rho i_{t-1} + (1 - \rho)[\beta_0 + \beta_1 \pi_{t+k} + \beta_2 y_{t+k} + \beta_3 (S_{t+k} - HEB_{t+k})] + \epsilon_t$$

	k = 3				k = 4			
	First		Last		First		Last	
<i>Constant</i>	0.196 (1.83)	0.476 (3.50)	0.150 (1.31)	0.366 (2.58)	0.107 (0.97)	0.324 (2.11)	0.064 (0.56)	0.189 (1.16)
$i_{t-1}$	0.756 (20.9)	0.768 (22.3)	0.804 (22.3)	0.821 (23.1)	0.765 (21.1)	0.786 (21.2)	0.799 (22.1)	0.817 (20.6)
$\pi_{t+k}$	0.441 (5.78)	0.363 (4.74)	0.352 (4.57)	0.279 (3.47)	0.462 (5.75)	0.374 (4.13)	0.402 (4.94)	0.340 (3.41)
$y_{t+k}$	0.274 (8.25)	0.512 (6.17)	0.224 (7.08)	0.407 (5.03)	0.268 (7.85)	0.440 (4.72)	0.230 (7.03)	0.322 (3.50)
$S_{t+k} - HEB_{t+k}$		-59.2 (3.10)		-47.3 (2.44)		-43.4 (1.98)		-24.4 (1.07)
$\bar{R}^2$	0.975	0.976	0.971	0.973	0.974	0.975	0.971	0.971

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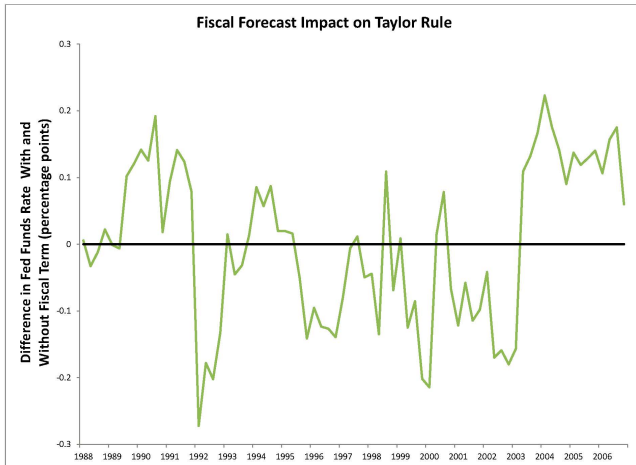
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New real-time data set on basic fiscal policy variables

- ▶ Revenue forecasts have been too optimistic on average
- ▶ Forecasts worse since Great Moderation
- ▶ Fiscal Policy was more countercyclical since the 1990s
- ▶ Fed seems to react to expected cyclical deficits