



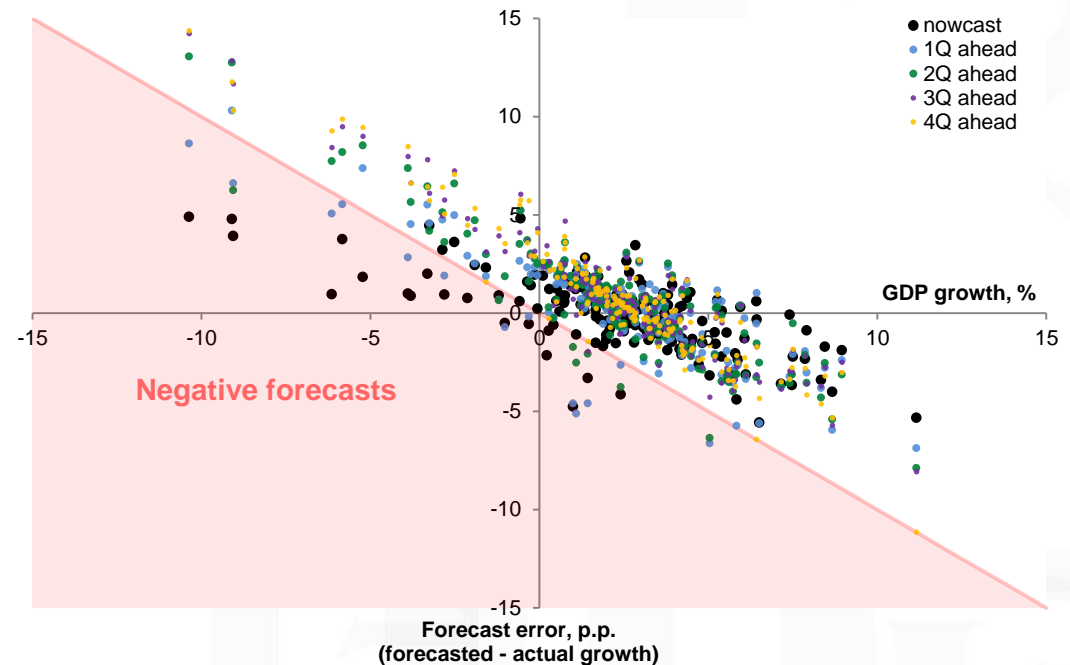
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Predicting US Recessions: Does a Wishful Bias Exist?

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- There is the evidence of optimistic bias in the expert GDP forecasting (see, for example, Loungani and Trehan, 2002; Batchelor, 2007; Elliott et al., 2008)
- Forecasters rarely predict negative GDP growth, and there is no pessimistic bias in times of actual downturn
- In this research, we are particularly interested in the wishful bias in predicting recessions



Data source: PhilFed, BEA

Forecasts of real GDP growth rates

- source: the Survey of Professional Forecasters by the Federal Reserve Bank of Philadelphia
- nowcasts and 1-4 quarters ahead consensus (median) forecasts
- 1968:Q4 – 2014:Q4 (185 quarters: 158 belonging to expansions, 27 belonging to contractions; 7 pairs of peaks and troughs)

Real GDP growth rates

- source: the Bureau of Economic Analysis
- first (“advance”) estimates

Turning points (peaks and troughs)

- source: The National Bureau of Economic Research
- quarterly version

Overall forecast bias and efficiency I

- Holden and Peel (1990) suggest a simple test for unbiasedness:

$$(f_{t,t+\Delta} - g_{t+\Delta}) = \alpha + u_t$$

$f_{t,t+\Delta} - \Delta$ (0:4) quarters ahead forecast of RGDP growth rate made in quarter t

$g_{t+\Delta}$ – actual RGDP growth rate in quarter $t + \Delta$

$$H_0: \alpha = 0$$

- Test results indicate significant positive bias for two, three and four quarters ahead forecasts (also holds with Newey-West corrected errors)
- Ljung-Box Q-statistics indicate the presence of serial correlations in residuals for all forecasts except nowcast, so only nowcast may be considered as weakly efficient

Weak form forecast efficiency may be accepted when the forecast is unbiased and the errors have a moving average form of no more than the appropriate order (in our case, of order Δ)

	nowcast	1Q	2Q	3Q	4Q
α	-0.102 (0.450)	0.222 (0.234)	0.447 (0.037)	0.725 (0.002)	0.850 (0.000)
Q ($\Delta+1$)	1.140 (0.286)	12.919 (0.002)	24.552 (0.000)	32.224 (0.000)	65.739 (0.000)

Note: p-values are given in parentheses

Overall forecast bias and efficiency II

- Mincer and Zarnowitz (1969) commonly used test:

$$g_{t+\Delta} = \alpha + \beta * f_{t,t+\Delta} + u_t$$

$$H_0: (\alpha, \beta) = (0, 1)$$

- H_0 was tested with the use of the standard linear restrictions joint hypothesis test procedure
 - applicable since modification of Dolado, Jenkinson and Sosvilla-Rivero (1990) procedure suggests rejection of the unit root hypothesis in all series
- Nowcast and one quarter ahead forecasts may be considered unbiased. Three and four quarters ahead positive forecasts are overly optimistic

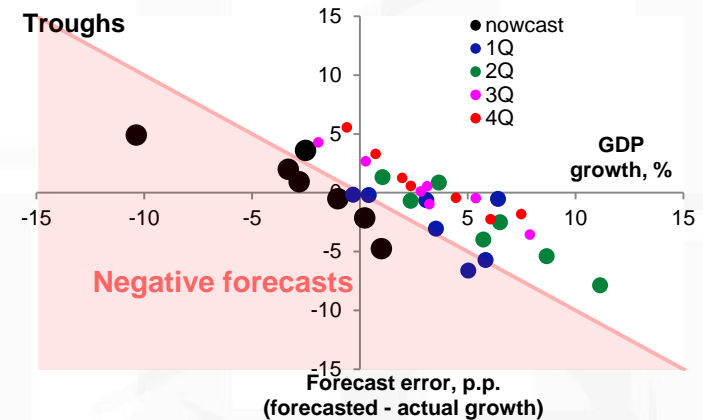
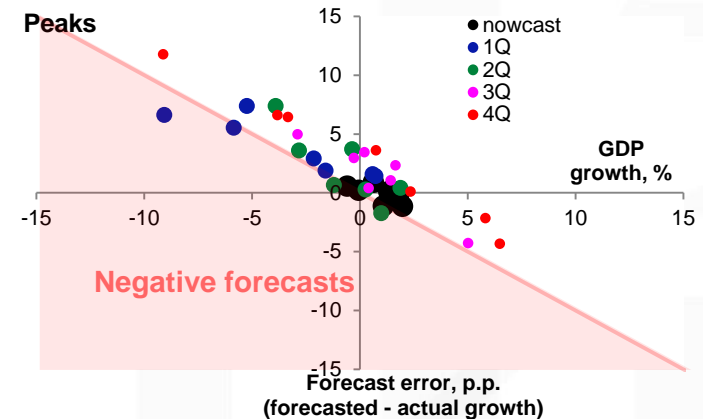
	nowcast	1Q	2Q	3Q	4Q
α	-0.149 (0.442)	-0.217 (0.513)	-0.034 (0.944)	0.579 (0.401)	0.487 (0.533)
β	1.108 (0.000)	0.998 (0.000)	0.856 (0.000)	0.586 (0.005)	0.588 (0.011)
PV $\beta=1$	0.072	0.985	0.332	0.046	0.075
PV $(\alpha,\beta)=(0,1)$	0.148	0.494	0.070	0.001	0.000

Note: p-values are given in parentheses

Forecasting in turning points I

Actual GDP growth and forecasts made in turning points

Date	GDP, first release	Forecast horizon				
		nowcast	1Q	2Q	3Q	4Q
Peaks						
1969:Q4	-0,1	0,2	0,3	0,6	2,5	3,1
1973:Q4	1,3	1,4	-0,3	-0,6	2,1	2,7
1980:Q1	1,1	0,0	-2,5	-0,7	0,8	2,2
1981:Q3	-0,6	0,0	2,1	3,5	4,0	4,3
1990:Q3	1,8	1,4	0,8	0,8	0,8	2,4
2001:Q1	2,0	0,8	2,2	3,3	3,7	3,7
2007:Q4	0,6	1,5	2,2	2,3	2,7	2,8
Troughs						
1970:Q4	-3,3	-1,3	5,9	4,5	2,9	3,8
1975:Q1	-10,4	-5,5	-0,5	3,3	4,9	5,7
1980:Q3	1,0	-3,8	-1,6	4,0	2,3	4,9
1982:Q4	-2,5	1,1	2,4	3,3	4,3	4,0
1991:Q1	-2,8	-1,9	0,2	1,7	2,9	3,2
2001:Q4	0,2	-1,9	0,1	2,4	3,6	4,0
2009:Q2	-1,0	-1,5	0,4	1,7	2,2	2,9



Data source: PhilFed, BEA, NBER

Forecasts of real GDP growth rates made in peaks tend to be positive at all forecasting horizons

- Bias for forecasts made in turning points may be captured with the use of the following regression:

$$g_{t+\Delta} = \alpha + \beta * f_{t,t+\Delta} + \mathbb{1}_{peak} + \mathbb{1}_{trough} + u_t$$

$\mathbb{1}_{peak}$ – dummy for forecasts made in peaks

$\mathbb{1}_{trough}$ – dummy for forecasts made in troughs

- Significant positive bias was found in one, two and four quarters ahead forecasts in peaks
- Significant negative bias was found in one and two quarters ahead forecasts in troughs

	nowcast	1Q	2Q	3Q	4Q
α	-0.135	-0.069	0.087	0.712	0.676
β	1.103***	0.960***	0.797***	0.553***	0.556**
$\mathbb{1}_{peak}$	0.170	-3.800***	-1.857*	-1.199	-2.465**
$\mathbb{1}_{trough}$	-0.214	2.548***	3.149***	0.437	0.283
R^2	0.654	0.422	0.208	0.049	0.061

Comparison with AR models

- As a simple comparison model, AR(2) GDP forecasts were simulated
- One forecast was based on the whole (expanding) period, the other – on 20 quarters rolling window; both used the data on GDP revised up to the forecast date
- Professional forecasts for three and four quarters ahead are not found to be more efficient than AR models in terms of R^2
- As well as professional forecasters, AR-model forecasts were unable to capture recessions

Whole period

	nowcast	1Q	2Q	3Q	4Q
α	-0.025	-0.007	1.161	5.585**	9.388***
β	0.868***	0.797***	0.373	-0.906	-1.988**
$\mathbb{1}_{\text{peak}}$	-1.689	-5.817***	-3.189***	-1.524	-2.262*
$\mathbb{1}_{\text{trough}}$	-3.258***	1.974*	3.448***	0.156	0.305
R^2	0.242	0.172	0.082	0.022	0.061

20 quarters rolling window

	nowcast	1Q	2Q	3Q	4Q
α	1.977***	2.348***	2.628***	3.687***	3.833***
β	0.279**	0.106	-0.082	-0.487***	-0.529***
$\mathbb{1}_{\text{peak}}$	-2.037*	-5.920***	-3.077***	-1.187	-2.079*
$\mathbb{1}_{\text{trough}}$	-4.657***	1.034	3.063**	-0.033	0.242
R^2	0.146	0.136	0.081	0.054	0.074

- Overall, only nowcasts and one quarter ahead professional forecasts may be considered unbiased, while three and four quarters ahead forecasts are overly optimistic
- Three and four quarters ahead forecasts have extremely low predicting power
- Significant positive bias was found in one, two and four quarters ahead forecasts in peaks, indicating failure in predicting recessions. It may be explained with the following reasons:
 - either because experts rely too heavy on extrapolations
 - or because there is a wishful bias against predicting recessions
- Significant negative bias was found in one and two quarters ahead forecasts in troughs, indicating failure in short-term identification of economic upturn

Thank you for your attention!