Evaluation of IMF and OECD Output Growth Forecasts

A presentation for the PhD seminar
Brandeis University, March 2004

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Outline

- Real GDP forecasts for G7 in ’73–’01
- Same-year and year-ahead forecasts

- *World Economic Outlook* of the International Monetary Fund (IMF)
- *Economic Outlook* of the Organisation for Economic Cooperation & Development (OECD)
Significance

- Forecasts inform our decisions
- We spend lots of money on econometric models that look ahead
- How good are those sophisticated forecasts compared to naive ones?
Contribution

- Another macro-forecast evaluation? Yawn
- Artis (‘96) and Pons (‘00) found that the IMF’s GDP forecast accuracy has not improved significantly over time
- My verdict is more optimistic
Main findings (1)

- IMF’s forecast accuracy compared to the OECD improved since 1987
- In 1986 the IMF invested significantly in econometric modeling
Main findings (2)

- Year ahead forecasts are more than 1.0 percentage point wrong on avg
- Same year forecasts >0.5 point wrong
- Naïve models only about 30% worse
2001 US example

- IMF Oct ’00 5.2
- OECD Dec ’00 3.5
- IMF May ’01 1.5
- OECD Jun ’01 1.7
- First available 1.2
- First settled 0.3
2002 US example

- IMF Oct '01 2.2
- OECD Dec '01 0.7
- IMF Dec '01 0.7
- IMF Apr '02 2.3
- OECD Jun '02 2.5
- First available 2.4
- First settled 2.4
IMF & OECD Year Ahead Forecasts for the US

Year

% points


IMF & OECD
Year ahead forecasts & actual values for the US

% points

Year


IMF
OECD
Actual
IMF & OECD Same Year Forecasts for the US

Year

% points


IMF
OECD
Same Year Forecasts & actual values for the US


% points: -6.0, -4.0, -2.0, 0.0, 2.0, 4.0, 6.0, 8.0

Graph showing forecasts and actual values over the years for the US.
Forecast error measurements

- Mean absolute error (MAE)
- Root mean squared error (RMSE)
- Theil’s U

\[
U = \frac{\text{RMSE}}{\left[ \left( \sum (A(t)-A(t-1))^2 / n \right)^{1/2} \right]}
\]

A(t) is the actual value at time t
n is the number of observations
Alternative Models

- The random walk
- A five-year average
- Exponential smoother

\[ F(t) = F(t-1) + 0.25 \left( A(t-1) - F(t-1) \right) \]

\( F(t) \) is the forecast at time \( t \)
Test for unbiasedness

- Underprediction or overprediction?
- T-test for the hypothesis that the mean forecast error $\gamma$ is zero in a regression of the error on a constant $e(t) = \gamma + v(t)$

$e(t)$ is forecast error or $A(t) - F(t)$
Tests for efficiency

- Do the forecasts reflect all information available at the time they were made?

\[ e(t) = \alpha_1 + \beta \cdot F(t) + u(t) \]

\[ e(t) = \alpha_2 + \rho \cdot e(t-1) + u(t) \]
Results to remember

- OECD more accurate than IMF in ’73-’01
- IMF improved from ’87, winner for US
- OECD forecasts deteriorated since ’87
- Naïve models 30% worse than the IMF
- Year-ahead forecasts > one point wrong
- Same-year forecasts > half point wrong
- Upward bias (not statistically significant)
Avenues for improvement

- More sophisticated error measurements (Diebold-Mariano)
- More sophisticated alternative models (VAR, BVAR, structural models)
- A more rigorous analysis of the impact of modeling on forecast accuracy
- Micro-foundations (behavioral? public forecaster’s loss function)