



**Bank
Financial
Group**

TD Economics

Special Report

June 25, 2008

IF A CENTRAL BANK'S FORECAST FALLS SHORT OF THE MARK, DOES IT MAKE A SOUND?

No forecast is perfect. Comparing the forecasts for 2008 GDP growth of four G-7 central banks – the Federal Reserve, Bank of Canada, European Central Bank and Bank of England – against our current forecasts suggests that each central bank is very likely to see GDP growth underperform their initial expectation.¹ This begs the question, when the economy's actual performance differs from a central bank's initial forecast, does this translate into a change in policy rates? It seems to reason that if economic growth ends up faster than first envisaged, interest rates might tend to rise to stem unexpected inflationary pressures. Conversely, and importantly for the near term, when central banks' expectations prove to be too optimistic, does this tend to drive them to lower rates?

In fact, the eventual level of interest rates does not seem to depend on whether the central bank gets the GDP forecast right. There is a close correlation between the year-over-year change in interest rates and the year-ahead GDP forecast errors for a few of the central banks. However, these misses are not a better predictor for forecasting changes in policy rates than simply looking at the outright pace of GDP growth. In fact, what connection there is between forecast errors and changes in interest rates seems largely spurious and driven by an apparent bias in central bank forecasts. When the economy grows faster than the estimated potential rate of GDP growth – where inflation neither accelerates nor decelerates – central bank forecasts tend to underestimate GDP growth, while when the economy grows slower than potential, central bank forecasts tend to be too optimistic.²

Learning from central bank mistakes

It takes 12 to 18 months for central banks' changes in interest rates to fully work their way through the economy. This is the time it takes for indi-

HIGHLIGHTS

- **Economic forecasts play an important part in the rate-setting decisions of central banks.**
- **However, central banks' forecasts errors for GDP growth seem to have limited ability to explain changes in interest rates relative to a simple forecast of GDP growth.**
- **Historical relationships suggest the Fed has delivered one too many quarter point cuts, the BoE should still deliver one more quarter point cut, and the BoC and ECB should stay where they are.**
- **The risk is that history may be a poor guide to future policy responses unless there is a return to normalcy soon with regard to inflation dynamics.**

viduals and businesses to alter their spending and saving patterns and for those rates that reset only periodically to catch up. As a result, economic forecasts play an important part in the rate-setting decisions of central banks. While every central bank is mandated to manage inflation, forecast misses for inflation are more difficult to tie to immediate changes in interest rates. This is because it is not important what inflation is doing right now, but rather what it is expected to be doing 12 months down the road.

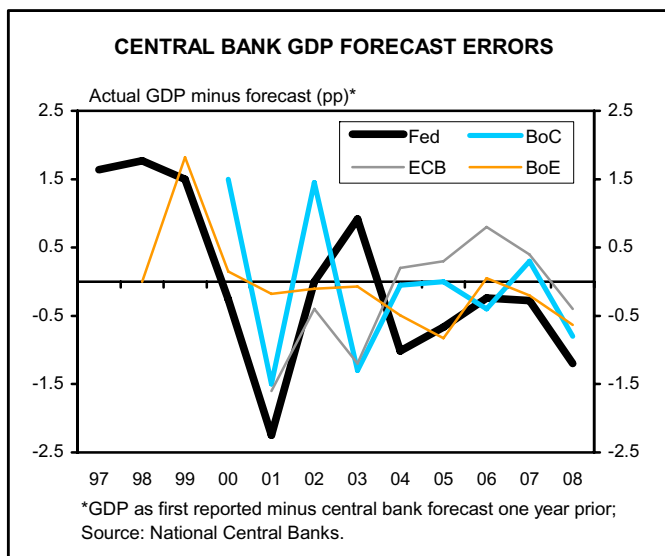
Because of this, GDP forecasts can prove more informative as inflation also tends to lag economic growth. So, if GDP growth turns out to be stronger or weaker than first expected, this could have implications for inflation prospects further down the road. Each central bank provides its forecasts at a different time and with differing frequencies. For the purposes here, we look at

the forecast for GDP growth in the year ahead that each central bank provided between December and February and measure its accuracy against the actual pace of annual GDP growth as it was initially reported in the first quarter of the following year. Since GDP figures can be subject to revision several years after the fact, this is a better reflection of forecast errors given the data known at the time. Annual forecasts and errors are used for the Federal Reserve (Fed) since 1997, the Bank of England (BoE) since 1998, the Bank of Canada (BoC) since 2000, and the European Central Bank (ECB) since 2001.³

In fact, these forecast errors appear to explain the year-over-year (y/y) changes in interest rates in both Canada and the Eurozone (see table for all results and charts on pages 4-5). **For each percentage point of forecast error in the Bank of Canada's year-ahead forecast, the y/y change in the BoC's policy rate (from December to December) tends to be 88 basis points (bps).** So when GDP growth turns out to be one percentage point faster than forecast, rates tend to rise by 88 bps, and when GDP growth comes in one percentage point below the forecast, rates tend to fall by 88 bps. **For the ECB, the change in interest rates has been an almost identical 89 bps.** The estimate for the Fed is 62 bps, but fails to pass the test for reasonable statistical significance. The BoE estimate is also highly insignificant, and even comes in with the wrong sign that would imply the central bank has tended to lower interest rates when GDP growth was unexpectedly strong and vice versa.

Keep it simple

If central banks are ultimately trying to set interest rates at an appropriate level to keep economic growth at a pace



GDP, CENTRAL BANK FORECASTS, AND THE IMPLICATION FOR INTEREST RATES				
	Fed	BoC	ECB	BoE
Y/Y change in central bank policy rate (bps) for each percentage point (PP) of GDP forecast error	62	88	89	-12
STEADY STATE: GDP growth rate at which Y/Y change in central bank policy rate is zero	3.3	2.8	1.8	2.5
Y/Y change in policy rate (bps) for each PP of GDP growth deviation from steady state	102	81	76	91
ERROR-FREE STATE: GDP growth rate at which central bank forecast error is zero	3.0	2.7	2.0	2.3
PP change in forecast error for each PP of GDP growth deviation from the error-free state	0.71	0.74	0.78	0.43

*Bold numbers are statistically significant at the 6% level.
Source: Central banks and TD Economics estimates

which delivers an acceptable rate of inflation, there may be better luck discerning a direct connection between the rate of economic growth and the change in interest rates. In fact, by this measure, all four central banks report statistically significant historic relationships. First off, we need an estimate of the steady state rate of economic growth. This is the rate of growth which in the past has been associated with no change in interest rates from one year to the next. Consistent with economic theory and expectations, for each country, these rates are close to the approximations for the potential rate of GDP growth – the pace of growth that tends to neither drive inflation to accelerate nor to decelerate (see table). **For each percentage point of deviation of GDP growth from these steady states/potential rates (for example, U.S. GDP growth of 4.3% instead of 3.3%), the Fed has tended to change rates by 100bps, the BoC and ECB by about 75 bps, and the BoE by about 90 bps.**

Combining these historical relationships with the actions of the four central banks to date and our current 2008 GDP forecasts, **suggests the Fed has delivered one too many quarter point cuts, the BoE should still deliver one more quarter point cut, and the BoC and ECB should stay where they are.** The biggest issue with this exercise is the relatively short time period that we are looking at. Inflation had been much tamer over the last decade than it is now. While we still expect inflation in these advanced economies to moderate as oil prices ease over the

next six months, central banks could face a scenario where they are not content to simply bring GDP growth to the steady state, but rather try to drive growth moderately lower in order to ease inflationary pressures, as with the ECBs expected interest rate hike in July.

Due to demographic, productivity, and cyclical changes – Canadian potential GDP growth may be a bit below 2.8% while the Fed’s estimate for the potential rate of GDP growth going forward (and ours) is closer to 2.8% than the historical 3.3%. Using this as the U.S. steady state would imply the Fed has delivered more than 75 bps of excessive interest rate cuts relative to the expected pace of GDP growth in 2008. While this clearly presents a risk to our expectation that U.S. rates will remain unchanged until mid-2009, this easing is still appropriate given our expectation for continuing U.S. economic weakness through much of 2009. Balancing heightened inflation concerns with the expectations for sub-par GDP growth in these four economies through 2009, we continue to believe that the next move for the Fed and BoC will be to raise rates, but not until well into 2009, while the next move from the ECB (after the near-term quarter point hike) and BoE will both be down. Central banks take forecast uncertainty into account when setting interest rates, however, and **given the wide uncertainty over inflation that is clearly biased to the upside in the near-term, there is an ongoing risk that central banks may alter the way they play the game and history may be only an imperfect guide.**

Central bank forecasts and physics

This leaves one last little oddity: the curious similarity – particularly for the BoC and ECB – between the changes in interest rates relative to forecast errors and interest rates relative to GDP growth itself. In a hybrid of the previous exercise, we find an error-free state of GDP growth – the rate of actual GDP growth at which central bank forecast errors have tended toward zero – which is very close to the steady state levels from before. For the Fed, BoC, and ECB, these banks have tended to accurately forecast when GDP would fall above or below potential. However, **for every percentage point deviation in actual GDP growth from the error-free/potential rate of GDP growth, these central banks’ forecasts have moved only a quarter of a point.**⁴ In other words, there appears to be a form of gravity keeping central banks’ forecasts grounded to potential – even at just the year-ahead basis. This is not entirely unexpected or even unwarranted. Numerous studies have shown that a basic forecast of GDP growth that simply projects a reversion to the mean can often outperform more complex models. But, it does suggest that the connection between the forecast error and changes in interest rates may be more of a by-product of the mechanics of the forecasts than a predictive insight into the future direction of monetary policy.

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Endnotes

- ¹ The Bank of Japan will also see the economy underperform their forecast but is excluded from here since interest rates have not meaningfully deviated from zero in the last decade.
- ² A truly unbiased forecast would overestimate GDP growth just as often as it underestimates it, regardless of what the actual pace of GDP growth turns out to be.
- ³ There are several other important differences. The Fed and BoE report GDP growth on a Q4/Q4 basis while the BoC and ECB use annual average figures. Also, the BoE actually reports two revised forecasts each quarter, which report GDP growth based on both interest rate futures in the market as well as unchanged interest rates. For the purposes here, the interest rate futures-based GDP forecast is used.
- ⁴ While the BoE level is not statistically significant using the annual data, a test of the quarterly BoE forecasts against actual GDP growth as it is reported now (not initially reported at the time) returns an error-free rate of GDP growth of 2.4% as highly significant. Moreover, the change in the forecast error is found to be a shockingly high 1.00%. This implies the BoE’s forecasts have simply tended to remain at 2.4% with any deviation from this being the full size of the forecast error. In fact, this is likely a bias in our own analysis since historical GDP revisions for the U.K. are not accounted for and have tended to increase GDP estimates over time.

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