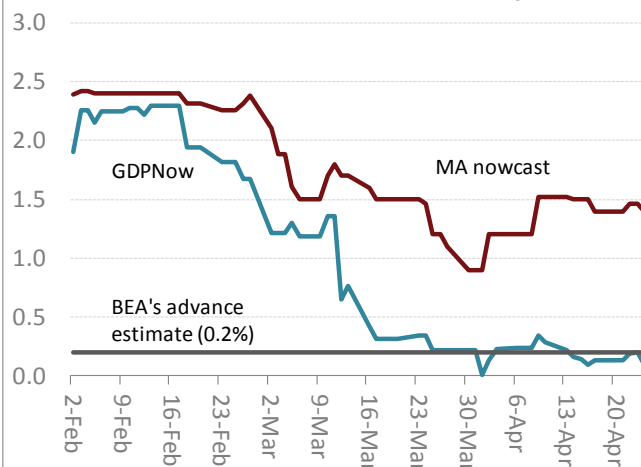Macroeconomic Advisers'
Macro Musing

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The Atlanta Fed's GDPNow and MA GDP Tracking

Since August 2011, the Atlanta Fed has been calculating and publishing a "nowcast" of current-quarter GDP growth, which they call "GDPNow."[1] Back in early February of this year, both we and the Atlanta Fed began nowcasting GDP growth for the first quarter of 2015. Early on in this process — as seen in the nearby chart — there was not much difference between our nowcast and GDPNow. While we were consistently higher than GDPNow, the difference between our forecasts exceeded four-tenths for only 6 business days between February 2 and March 11. But from March 12 to March 17, GDPNow broke sharply lower and zeroed in on BEA's eventual advance estimate of 0.2%; our tracking forecast remained too high.

Since this episode, we have received a lot of inquiries about GDPNow and how our procedures compare to those of the Atlanta Fed. This is especially interesting now, given that GDPNow is currently predicting only 0.7% growth in the second quarter, well below consensus of about 2¼%.[2] We and others have made the case for a more robust pick up in GDP growth citing factors such as residual seasonality, recovery from the effects of adverse winter weather, and recovery from the West Coast port slowdown.[3] In this *Macro Musing*, we provide a non-technical, high-level overview of the similarities and differences between our procedures and GDPNow, and we summarize our respective track records. We conclude that the similarities between our two methods are probably more important than the differences, and our track records are comparable.

Tracking of 2015:Q1 GDP Growth
Atlanta Fed's GDPNow vs. MA Tracking

Sources: Macroeconomic Advisers, Atlanta Fed, Bureau of Economic Analysis.

SIMILARITIES AND DIFFERENCES
At a very broad level, the Atlanta Fed and we are doing largely the same thing.

- We both employ methodologies that make use of monthly indicator data to track GDP growth in the current quarter.
- At each point in time, for each month of the forecasted quarter, we both have either an observation on a monthly indicator or a projection.
- As the monthly data come in, and as they differ from our projections, we both update our GDP forecast.

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[1] See "https://www.frbatlanta.org/cqer/research/gdpnow.aspx".
[2] At the time of this writing, we were tracking 1.9% growth in Q2.
[3] For our take on the bounce-back from residual seasonality and weather, see "Residual Seasonality in GDP Growth Rates – Part 2: Residual Seasonality and Weather Effects Together Lowered Q1 by More Than 3 Percentage Points," Macroeconomic Advisers' *Macro Focus*, May 15, 2015; vol. 10, no. 6.

BEN HERZON
(314) 721-4747
herzon@macroadvisers.com

231 SOUTH BEMISTON AVE.
SUITE 900
ST. LOUIS, MO 63105

801 17TH STREET, NW
SUITE 202
WASHINGTON, DC 20006

E-MAIL
MAIL@MACROADVISERS.COM

VISIT US ON THE WEB
WWW.MACROADVISERS.COM

There are, however, several important differences between our two methodologies. The first is their use of a BVAR.

- The Atlanta Fed uses a quarterly BVAR (Bayesian vector autoregression) to project 13 components of GDP into the current quarter.
- For several of these 13 components, they combine the BVAR projection with the projection they get from their indicators models to arrive at a "blended" forecast of the GDP component.
- We don't do that. We use only our indicators models.

The second broad difference is the Atlanta Fed's more liberal and formal incorporation of non-source-data indicator series.

- The Atlanta Fed uses 124 monthly indicator series in their indicators models, some of which are source data in GDP and some of which are not.
- By doing this, the Atlanta Fed is taking advantage of the correlation between non-source-data indicator series and the corresponding GDP component, even though the data are not explicitly used to calculate GDP.
- Because we are essentially replicating (at a high level) BEA's methodology, we do not make explicit use of non-source-data indicator series in our models.
- But we do maintain auxiliary models that relate non-source data to GDP and refer to them in lining up our assumptions for the source data.
- An example is a regression of GDP goods on manufacturing IP. While manufacturing IP is not used to calculate GDP, it is correlated, and if our forecast of GDP goods does not comport with the prediction from the IP model, we re-examine our assumptions for the monthly source data that feed into our estimate of GDP goods.
- By including non-source-data indicator series in their models, the Atlanta Fed has formalized this approach and expanded it beyond what we do.

The third broad difference between our methodologies is related to how missing values of the monthly indicator series are projected into the current quarter.
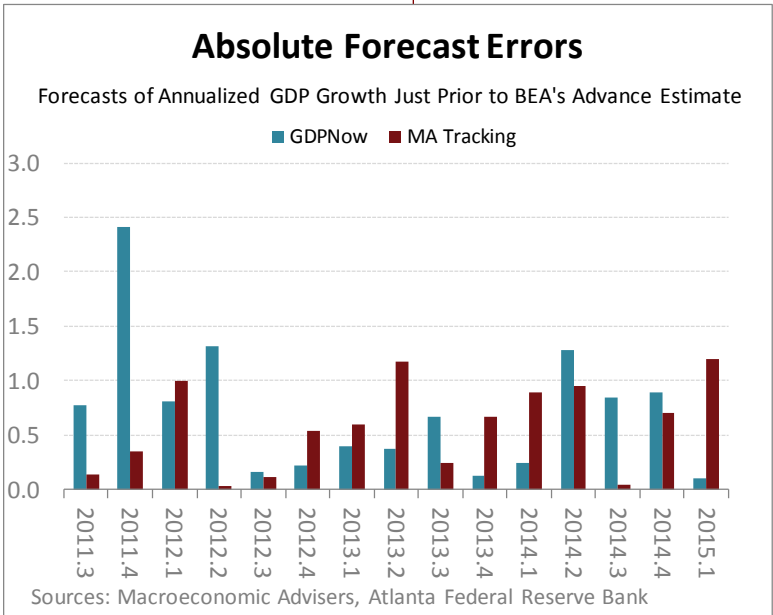
- To project the 124 indicator series, the Atlanta Fed extracts a single common factor, projects that common factor over the 3 months of the current quarter, and uses that projected common factor (along with lags of the indicator series) in equations that project the 124 indicator series into the current quarter.
- By doing so, they are formally imposing internal consistency among all 124 indicator-series projections (to the extent the common factor explains each series).
- This is not how we enforce internal consistency. We have a handful of monthly behavioral equations throughout our system that link a handful of monthly assumptions together (to ensure internal consistency among them).
- There is probably more internal consistency to be gained in our methodology by taking the Atlanta Fed's approach to the series not covered by our behavioral equations. This is an avenue we will be exploring in the near future.

There are more differences between our and the Atlanta Fed's methodologies, but these are the high-level, important ones.

TRACK RECORDS OF GDPNOW AND MA TRACKING

GDPNow and our GDP tracking have similar track records when considered over the full period over which GDPNow has been live. The nearby chart shows the absolute forecast errors of both GDPNow and our tracking associated with the last estimates prior to the advance estimate of GDP (think 1 or 2 days prior to the GDP report). Here we see the relatively good performance of GDPNow for the first quarter of 2015. But over the prior 3 quarters, our tracking proved better than GDPNow.

- Averaged over the last four quarters, our mean absolute error (MAE) at this forecast horizon (just prior to the GDP release) was 0.7 percentage point; GDPNow was 0.8 percentage point. (See the nearby table.)
- Averaged over the last eight quarters, our MAE was 0.7 percentage point, versus 0.6 percentage point for GDPNow.
- Over the entire period for which GDPNow has been live (2011:Q3 – 2015:Q1), our MAE was 0.6 percentage point, versus 0.7 percentage point for GDPNow.

Absolute Forecast Errors

Forecasts of Annualized GDP Growth Just Prior to BEA's Advance Estimate

Sources: Macroeconomic Advisers, Atlanta Federal Reserve Bank

More germane to the current situation, though, is the forecasting performance at longer horizons. When we issued our latest base forecast for second-quarter GDP growth (on May 13), we were about 2½ months away from BEA's advance estimate of Q2 GDP growth, and our projection was materially different from GDPNow — we were at 2.0%, while GDPNow was at 0.7%. If our respective forecasting performances over this type of horizon were materially different, this would provide insight into whether and to what extent we should discount either projection.

As it turns out, our track records over this type of horizon are not materially different. We compiled our respective forecasts of GDP growth at roughly 2½ months prior to BEA's advance estimate, calculated the mean absolute errors, and included them in the nearby table.[4]

- Over the last four quarters, our mean absolute errors at this longer horizon are identical (0.8 percentage point for both our tracking and GDPNow).
- Over the last eight quarters, our MAE was two-tenths lower than GDPNow.
- Over the entire period for which GDPNow has been live, our MAE was two-tenths lower than GDPNow.

There are other metrics we can use to compare our relative performances. We've also included median absolute errors and root mean squared errors in the table. Also, since

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[4] In particular, we compiled the MA base forecast completed in the second calendar month prior to the advance estimate of GDP. This usually put us about 2½ months ahead of the advance estimate. For GDPNow, we recorded the projection extant on the day of our base forecast. In most cases, GDPNow was updated on either the same day of our base forecast or within a day or two prior to our base forecast. In two cases, we had to use GDPNow figures that were updated after we completed our base forecast.

Absolute Errors: MA Tracking vs GDPNow

Mean Absolute Errors

	Just Prior to GDP		About 2½ Months Prior to GDP	
	MA	GDPNow	MA	GDPNow
Last 4 qtrs	0.7	0.8	0.8	0.8
Last 8 qtrs	0.7	0.6	0.9	1.1
All qtrs	0.6	0.7	0.7	0.9

Median Absolute Errors

	Just Prior to GDP		About 2½ Months Prior to GDP	
	MA	GDPNow	MA	GDPNow
Last 4 qtrs	0.8	0.9	0.5	0.5
Last 8 qtrs	0.8	0.5	0.5	1.1
All qtrs	0.6	0.7	0.4	0.7

Root Mean Squared Errors

	Just Prior to GDP		About 2½ Months Prior to GDP	
	MA	GDPNow	MA	GDPNow
Last 4 qtrs	0.8	0.9	1.2	1.1
Last 8 qtrs	0.8	0.7	1.2	1.4
All qtrs	0.7	0.9	1.0	1.2

Notes: "Last 4 qtrs" covers 2014:Q2 - 2015:Q1. "Last 8 qtrs" covers 2013:Q2 - 2015:Q1. "All qtrs" covers 2011:Q3 - 2015:Q1.

GDPNow has been live, MA's absolute error has been smaller than GDPNow at both forecast horizons roughly one-half of the time. No matter how the comparison is made, it's safe to say that there is no material difference between our track record and that of GDPNow. Indeed, in an FAQ posted on the GDPNow website, the Atlanta Fed states that "Overall, these accuracy metrics do not give compelling evidence that the model is more accurate than professional forecasters."[5]

CONCLUSION

We are big fans of the Atlanta Fed's GDPNow model. We appreciate the analytical rigor underlying the model. Importantly, we have identified places in our tracking system that likely can benefit from adopting some of the specific methodologies used in the Atlanta Fed's GDPNow model. To the extent we can usefully employ some of these methods, we likely will reduce our forecast error. We also like the fact that once the model is specified, it is a judgment-free forecast; a clean look at what the data and methodology imply for current-quarter GDP growth. Regarding the similarities and differences between our two approaches, we think the similar track records highlight the notion that the similarities are probably more important than the differences.

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[5] See the FAQ section of "https://www.frbatlanta.org/cqer/research/gdpnow.aspx".