US Business Cycle Risk Report

CapitalSpectator.com

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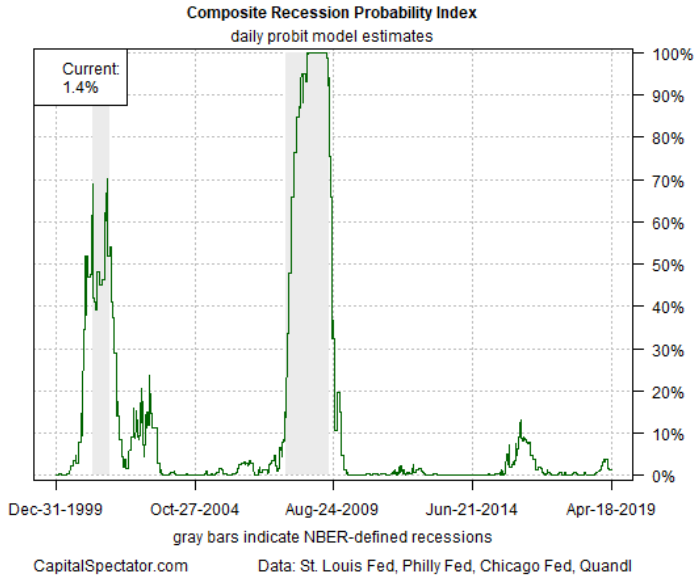
The US business cycle continues to show signs of stabilizing at a relatively moderate pace. Last week's key updates, however, delivered a mixed message, albeit an indecisive one (so far) and so the worst-case scenario for now remains a slow-growth outlook.



On the plus side, retail spending rebounded sharply in March, lifting the 1-year trend to +3.6%, a four-month high. Industrial production's year-over-year change, by contrast, continued to ease, slightly, dipping to +2.8%, the slowest growth in 10 months.

A more troubling signal arrived in the housing data. New residential construction fell 14.2% in March from a year earlier – the deepest annual loss in eight years.

It's unclear at this point if housing represents a threat to the US expansion, but it's premature to dismiss the possibility. The next few months will likely reveal the answer, one way or the other.

Meantime, the data published to date continue to show that US recession risk remains low. CRPI's estimate that a new NBER-defined downturn has started is just 1.4%, as of Apr. 18 (see chart at left and p. 7).

Forward estimates of ETI and EMI through May also indicate that a modest growth trend will likely prevail for the immediate future (bottom chart, p. 2).

Note, too, that today's revised nowcast of Q1 GDP growth ticked up to +2.4% (p. 8). In other words, next week's "advance" GDP report for the first quarter (due on Fri., Apr. 26) is on track to accelerate, fractionally, over last year's +2.2% gain in Q4. If accurate, quarterly output is set to improve over the previous quarter for the first time since last year's Q2.

Although trouble could be brewing for the second half of the year and beyond, there's still no sign that a new recession is near. On that note, Monday's March update of the Chicago Fed National Activity Index for the 3-month average (due on Apr. 22) will likely indicate that a moderate, albeit below-trend rate of growth prevailed at Q1's close.

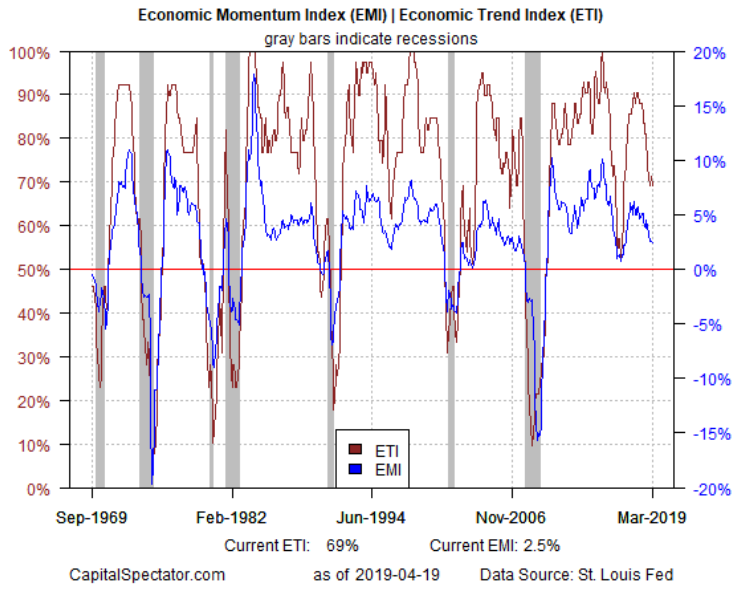
Mon, Apr 22 Chicago Fed Nat'l Activity Index (Mar), existing home sales (Mar)
Tues, Apr 23 FHFA House Price Index (Feb), new home sales (Mar), Richmond Fed Mfg Index (Apr)
Wed, Apr 24 No major US economic releases scheduled
Thurs, Apr 25 Jobless claims (wk 4/20), durable goods orders (Mar), Kansas City Fed Mfg Index (Apr)
Fri, Apr 26 GDP (Q1), Consumer Sentiment Index (Apr)

Business Cycle Index Values			Recession-Risk Probability Estimates *	
	Current	*page*		Current
ETI	69.0%	*2-3*	ETI	1.4%
EMI	2.5%	*2-3*	EMI	4.0%
MMRI	3.2%	*4*	MMRI	0.0%
CFNAI-MA3	-0.18	*5*	CFNAI-MA3	6.7%
ADS Index	-0.072	*6*	ADS Index	0.5%
		7	CRPI	1.4%
as of: 4/20/2019			* based on probit model estimates	
Q1:2019 GDP	2.4%	*8*		
Key Economic Indicators		*9*		

	low risk
	medium-low risk
	medium-high risk
	high risk

see parameter rules definitions on p. 9

ETI and EMI



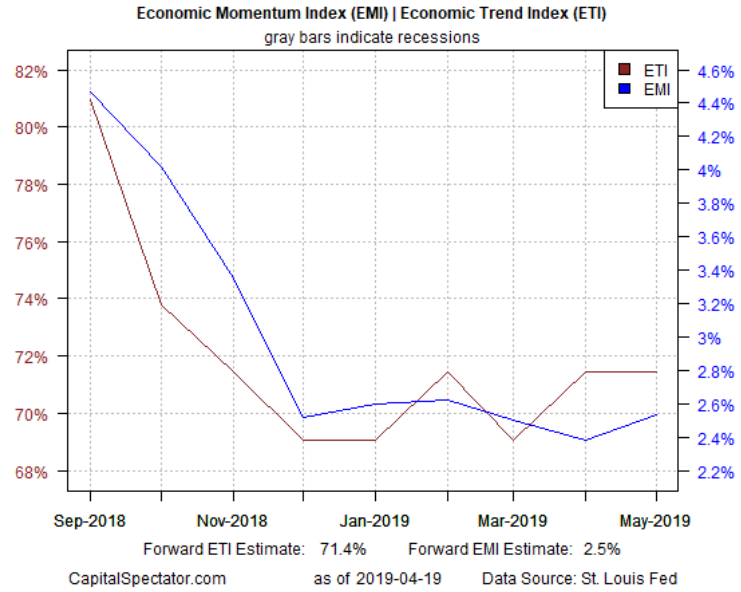
ETI is a diffusion index (i.e., an index that tracks the proportion of components with positive values) for the 14 leading/coincident indicators (see p. 9). ETI values reflect the 3-month average of the transformation rules defined in the table on p. 9. EMI measures the same set of indicators/transformation rules based on the 3-month average of the median monthly percentage change for the 14 indicators.

ETI values above (below) 50% align with growth (recession). EMI values above (below) 0% align with growth (recession).

The methodology for calculating ETI and EMI is detailed in:

Nowcasting The Business Cycle:
A Practical Guide For Spotting Business Cycle Peaks
(2014, Beta Publishing).

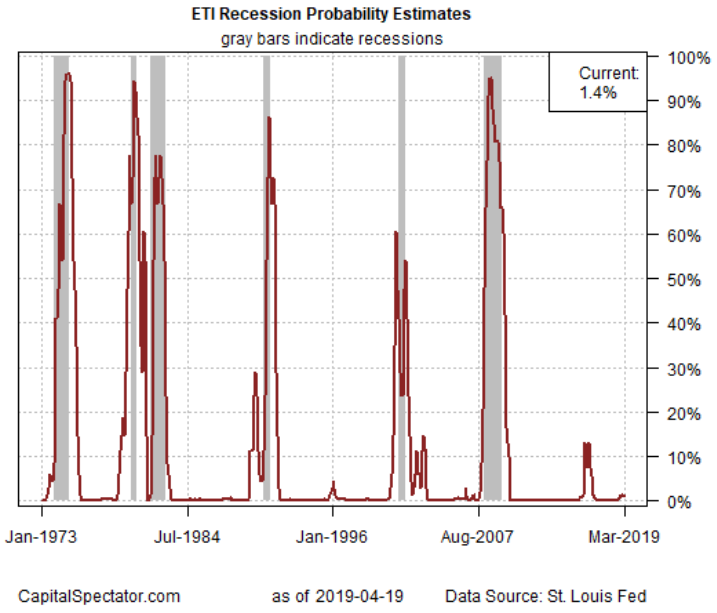
Near-term projections: ETI and EMI



For near-term projections of ETI and EMI, the missing data points are estimated with an ARIMA model.

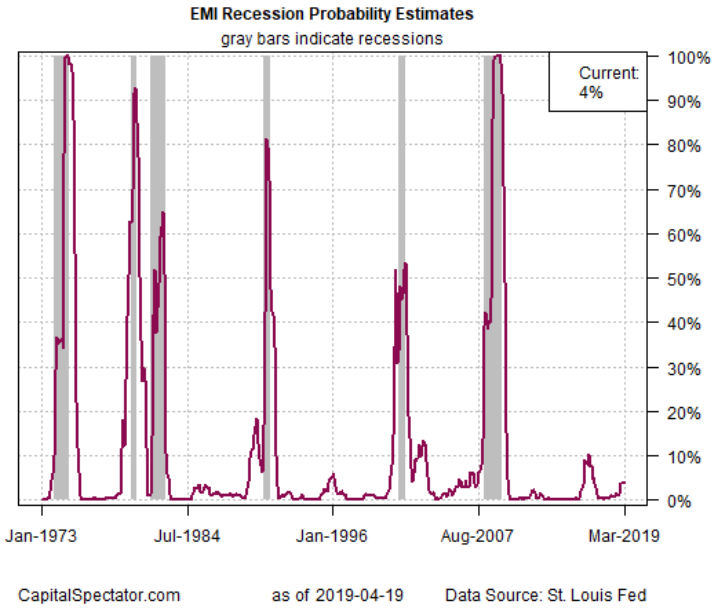
Forecasts are always suspect, of course, but recent projections of ETI & EMI for the near-term future have proven to be relatively reliable guesstimates vs. the full set of published numbers that followed. That's not surprising, given the broadly diversified nature of ETI & EMI. Predicting individual components, by contrast, is prone to far more uncertainty in the short run. The assumption here is that while any one forecast for a given indicator will likely miss the mark, the errors may cancel out to some degree by aggregating a broad set of predictions. That's a reasonable assumption based on the historical record for the forecasts.

Recession risk probability: ETI



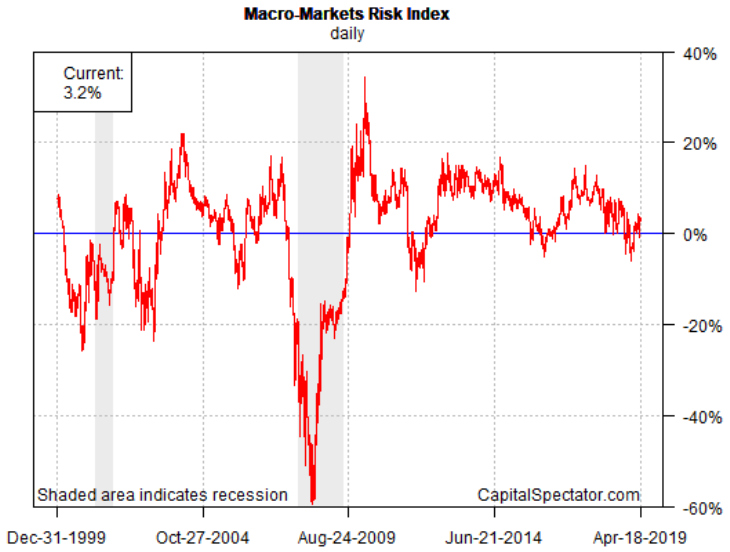
A probit model translates ETI's values into recession-risk probabilities on a monthly basis by comparing the index with the historical record of NBER's recession dates.

Recession risk probability: EMI



A probit model translates EMI's values into recession-risk probabilities on a monthly basis by comparing the index with the historical record of NBER's recession dates.

Macro-Markets Risk Index



Data: BoAML, Quandl, St. Louis Fed

The Macro-Markets Risk Index (MMRI) is designed as a real-time proxy for business-cycle risk based on four data sets:

- ***US stocks** (S&P 500), 252-trading day % change*
- ***High yield credit spread** (BofA ML US High Yield Master II Option-Adjusted Spread) inverted 252-trading day % change*
- ***Treasury yield curve** (10-yr Treasury yield less 3-month T-bill yield)*
- ***Oil prices** (US benchmark: WTI) inverted 252-trading day % change*

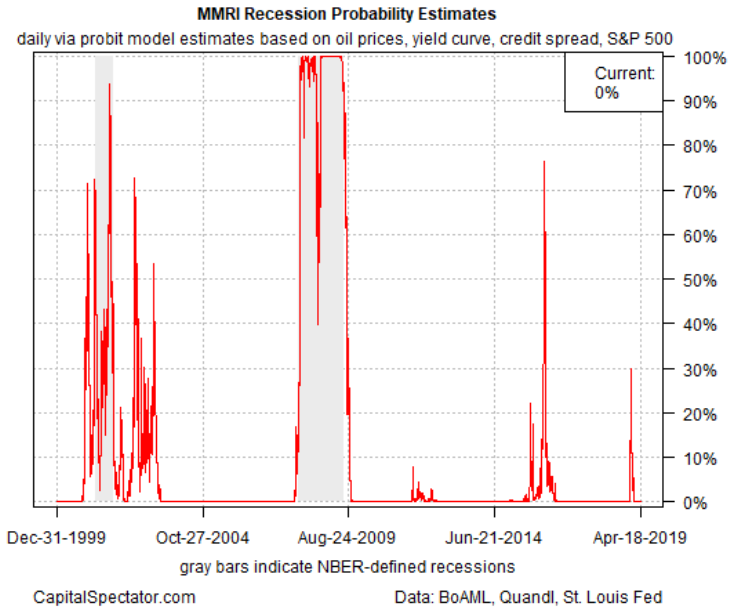
Analyzing the market-price components of ETI and EMI separately offers a real-time approximation of macro conditions, according to the "wisdom of the crowd."

Why look to the financial and commodity markets for insight into the economic trend? Timely signals. Conventional economic reports are published with a time lag. This analysis is intended for use as a supplement for developing real-time perspective until a complete data set is published for updating the monthly economic profile.

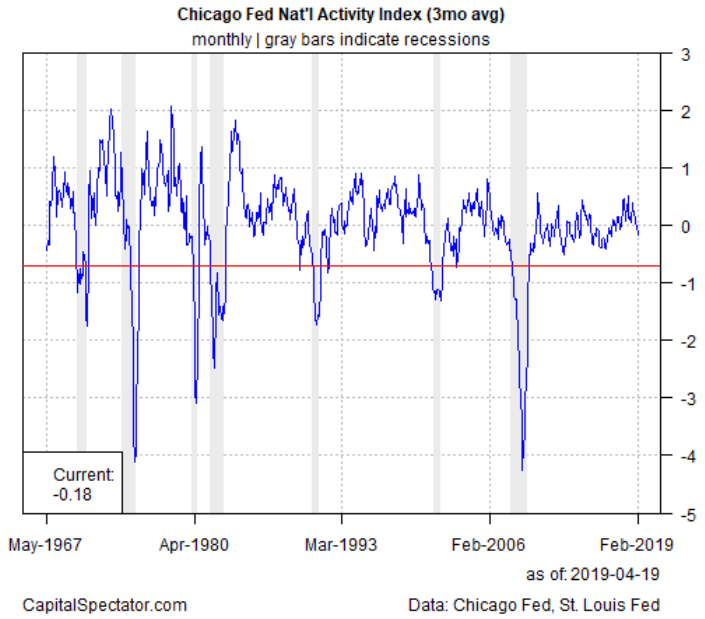
A decline below 0% in MMRI (horizontal blue line in to chart at left) indicates that recession risk is elevated while readings above 0% imply that the economy will expand in the near-term future.

A probit model translates MMRI's values into recession-risk probabilities on a daily basis by comparing the index with the historical record of NBER's recession dates.

Recession risk probability: MMRI



Chicago Fed Nat'l Activity Index



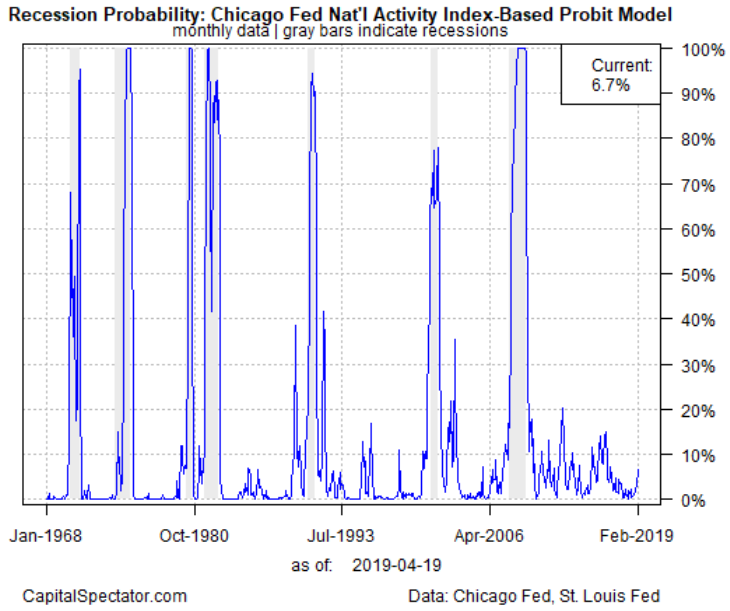
The Chicago Fed National Activity Index is a weighted average of 85 existing monthly indicators of national economic activity. It is constructed to have an average value of zero and a standard deviation of one. Since economic activity tends toward trend growth rate over time, a positive index reading corresponds to growth above trend and a negative index reading corresponds to growth below trend.

When the three-month moving average of the index (CFNAI-MA3) moves below –0.70 (horizontal red line in top chart at left) following a period of economic expansion, there is an increasing likelihood that a recession has begun. Conversely, when the CFNAI-MA3 value moves above –0.70 following a period of economic contraction, there is an increasing likelihood that a recession has ended.

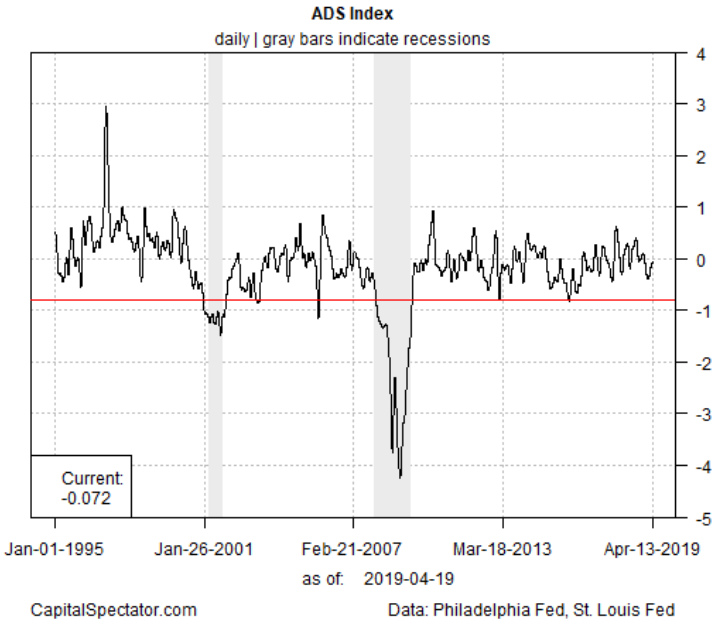
For additional information, see the Chicago Federal Reserve's web site: www.chicagofed.org

A probit model translates CFNAI-MA3 values into recession-risk probabilities on a monthly basis by comparing the index with the historical record of NBER's recession dates.

Recession risk probability: Chicago Fed Nat'l Activity Index



ADS Business Conditions Index



The Aruoba-Diebold-Scotti (ADS) Business Conditions Index is designed to track real business conditions at high frequency. Its underlying (seasonally adjusted) economic indicators (weekly initial jobless claims; monthly payroll employment, industrial production, personal income less transfer payments, manufacturing and trade sales; and quarterly real GDP) blend high- and low-frequency information and stock and flow data. The ADS Index is updated as data on the underlying components are released.

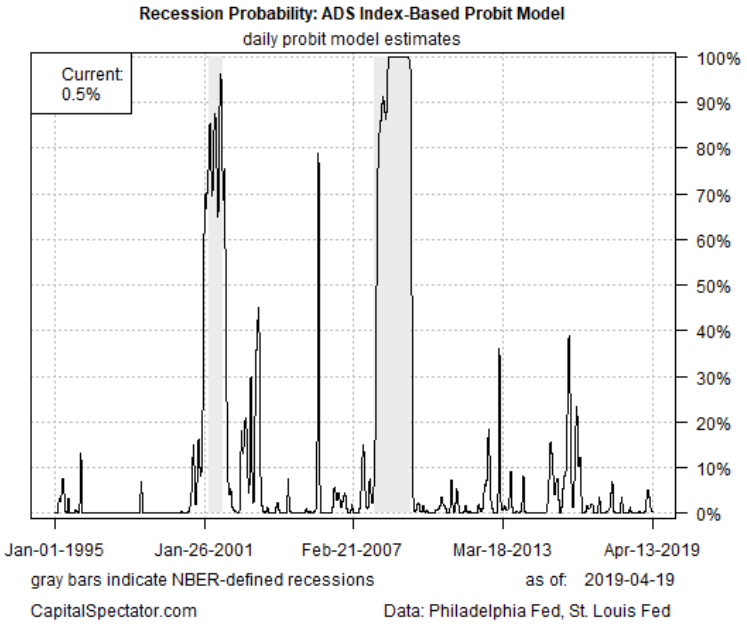
The average value of the ADS index is zero. Progressively bigger positive values indicate progressively better-than-average conditions, whereas progressively more negative values indicate progressively worse-than-average conditions. A value of -3.0, for example, would indicate business conditions significantly worse than at any time in either the 1990-91 or the 2001 recession, during which the ADS index never dropped below -2.0.

Analysis by the San Francisco Fed advises that the "optimal recession threshold" for the ADS Index is -0.80, indicated by the horizontal red line in the top chart at left. For details on this analysis, see: "Diagnosing Recessions" by Òscar Jordà in the Federal Reserve Bank of San Francisco Economic Letter (Feb. 10, 2010) at: www.frbsf.org

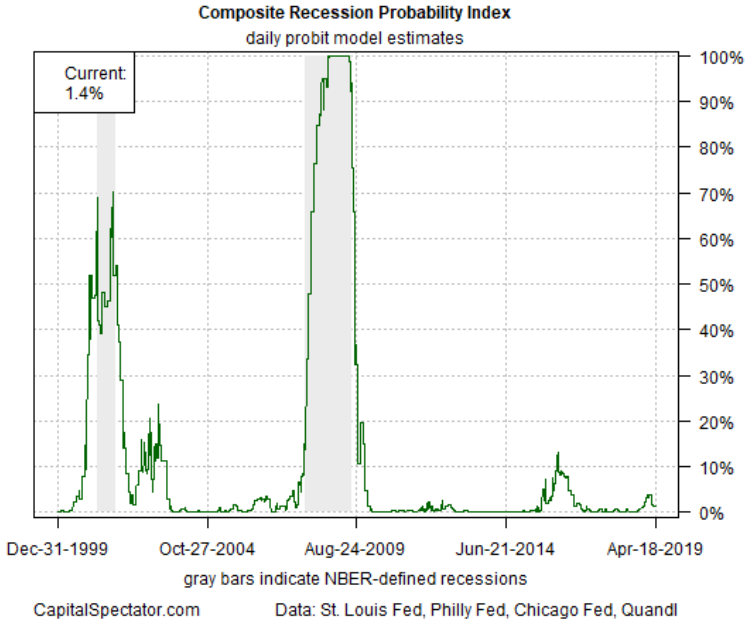
For additional information about the ADS Index, see the Philadelphia Federal Reserve's web site: www.philadelphiafed.org

A probit model translates ADS Index values into recession-risk probabilities on a daily basis by comparing the index with the historical record of NBER's recession dates.

Recession risk probability: ADS Business Conditions Index



Recession risk probability: CRPI



The Composite Recession Probability Index (CRPI) reflects the median recession probability via probit modeling of the following indexes:

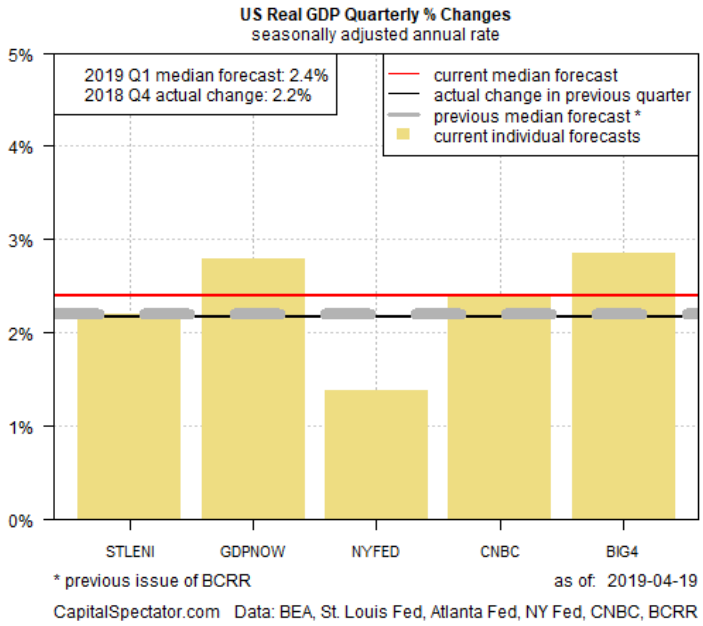
1. *ETI (pp. 2-3)*
2. *EMI (pp. 2-3)*
3. *MMRI (p. 4)*
4. *CFNAI (p. 5)*
5. *ADS Index (p. 6)*

CRPI is designed as robust measure of US recession risk that's expected to benefit from the advantages of combining forecasts/nowcasts. The literature is long and deep in this niche, starting with "The combination of forecasts" by J. Bates and C.W.J. Granger in Operations Research Quarterly*, 20:451-468, 1969.*

The main takeaway: combining forecasts/nowcasts typically delivers more reliable signals by reducing dependence on any one model. That's because every model is flawed in some degree. Combining the forecasts/nowcasts based on models with different assumptions, parameters, and inputs is a reasonably reliable methodology for improving output accuracy relative to any one forecast/nowcast from a single model.

*For details on the literature, see "Combining forecasts: A review and annotated bibliography" by Robert T. Clemen (*Journal of Forecasting*, 5(4):559{583, 1989) and "Forecast combinations" by Allan Timmermann (*Handbook of Economic Forecasting*, 1:135-196, 2006).*

Gross Domestic Product Forecasts



The chart at left summarizes several estimates of the quarterly % change for the next GDP report. For context, the current reported GDP % change for the previous quarter is shown, as calculated by the US Bureau of Economic Analysis (solid black line).

The GDP data doesn't formally factor into the econometric recession-risk estimates for BCRR*; rather, the GDP profiling is presented for additional context for assessing the near-term outlook for economic activity.*

The current projection reflects the median estimate of the following five forecasts based on the latest revisions:

STLENI: St. Louis Fed's Economic News Index, which projects the GDP growth rate for the upcoming report. The methodology is based on economic content from key monthly economic data releases. For details, see: fred.stlouisfed.org

GDPNOW: a "nowcast" model developed by the Atlanta Fed. For details, see: frbatlanta.org

NYFED: A "nowcast" model developed by the New York Fed. For details, see: newyorkfed.org

CNBC: The median forecast of Wall Street analysts based on survey data via the CNBC Rapid Update. For details, see: cnbc.com

BIG4: A BCRR *forecast based on a simple linear regression of the so-called Big-4 economic indicators – payrolls, industrial production, real personal consumption expenditures, and real personal income excluding current transfer receipts.*

The median of the five forecasts, supplied by different sources, each using a different methodology, is expected to deliver a relatively robust estimate of the upcoming GDP report by way of combining projections.[1]

For perspective on how the median forecast has evolved, the dashed black line shows the median projection from the previous issue of BCRR.

[1] See p. 7 for references on the academic literature related to combining forecasts.

ETI and EMI Component Indicators

US Economic Profile
April 20, 2019

	Indicator	Transformation	Dec-18	Jan-19	Feb-19	Mar-19
1	Labor Market Index [1]	1 yr % change	4.4%	3.3%	2.3%	3.2%
1a	*Private non-farm payrolls*	*1 yr % change*	*2.1%*	*2.1%*	*1.9%*	*1.9%*
1b	*Initial Jobless Claims* [2]	*1 yr % chg (inverted)*	*7.3%*	*5.3%*	*-2.4%*	*3.6%*
1c	*Employ.-to-Unemploy. Ratio*	*1 yr % change*	*6.4%*	*3.1%*	*8.4%*	*5.5%*
1d	*Index of Agg. Weekly Hours* [3]	*1 yr % change*	*1.7%*	*2.8%*	*1.3%*	*2.0%*
2	US Stock Market (S&P 500) [2]	1 yr % change	-3.6%	-6.5%	1.8%	3.7%
3	Real personal income ex current transfer receipts	1 yr % change	3.2%	2.5%	NA	NA
4	ISM Manufacturing Index	% +/- neutral: 50 [5]	8.6%	13.2%	8.4%	10.6%
5	Spot Oil (W. Tex. Intermed.) [2]	1 yr % chg (inverted)	14.4%	19.3%	11.7%	7.3%
6	Consumer Spending Index [6]	1 yr % change	0.9%	1.8%	0.7%	1.7%
6a	*Real Pers. Cons. Expend.*	*1 yr % change*	*2.0%*	*2.3%*	*NA*	*NA*
6b	*Real Retail Sales*	*1 yr % change*	*-0.3%*	*1.3%*	*0.7%*	*1.7%*
7	Treasury Yield Curve (10 yr Note less 3 mo T-bill) [2]	current monthly spread [7]	4.6%	3.4%	2.9%	1.7%
8	High-Yield Bond Spread (BofA ML US HY Option-Adjusted Spread) [9]	1 yr % chg (inverted)	-32.2%	-36.5%	-16.5%	-10.2%
9	Real Monetary Base (M0)	1 yr % change	-13.5%	-13.9%	-14.3%	-12.7%
10	University of Michigan Consumer Sentiment Index	1 yr % change	2.5%	-4.7%	-5.9%	-3.0%
11	Industrial Production	1 yr % change	3.8%	3.7%	3.5%	2.8%
12	New Residential Bldg. Permits	1 yr % change	0.5%	-3.6%	-2.4%	-7.8%
13	Real Mfg. & Trade Sales [8]	1 yr % change	0.9%	2.9%	NA	NA
14	ISM Non-Mfg. Index [4]	% +/- neutral: 50 [5]	16.0%	13.4%	19.4%	12.2%

1. Average 1-year % changes of payrolls, jobless claims, employed-to-unemployed ratio, and weekly hours index.
2. Average monthly data based on daily closes.
3. Production and Nonsupervisory Employees: Total Private Industries.
4. Data series begins Jan. 2008.
5. A neutral reading is assumed to be 50. The transformation is calculated as the % deviation for each monthly reading relative to 50.
6. Average of 1-year % changes for real personal consumption expenditures & real retail sales.
7. Monthly difference: 10yr less 3mo % rates, multiplied by 10.
8. Manufacturing & wholesale sales via BEA. Note: retail sales excluded.
9. Average monthly data. Moody's BAA-AAA spread through Nov-1997, HY spread data thereafter.

Note: The Labor Market Index is considered as 1 indicator, comprised of the four indicators in green cells. The same applies to the Consumer Spending Index, which is comprised of 2 indicators.

NA = data not yet available from source

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The Economic Trend & Momentum indexes are aggregates of 14 economic and financial indicators, as shown in the table at left. A complete data set for each month tends to lag by one to three months, depending on the indicator. Manufacturing and trade sales suffer the longest lag. By contrast, the market figures are available in real time.

To calculate ETI and EMI in the graphs and analysis above, missing data points must be estimated. To fill in the missing data points, an ARIMA model is used.

Parameter Rules for Summary Table on Page 1:

Business Cycle Index Values							**GDP Nowcast**
		ETI	**EMI**	**MMRI**	**CFNAI**	**ADS**	
	low risk	>80%:100%	> 5%	> 5%	> 0.2	> 0.2	> +3.5%
	medium-low risk	55%:80%	1%:5%	0%:5%	-0.2:+0.2	-0.2:+0.2	+1.5%:+3.5%
	medium-high risk	45%: < 55%	-1%: < 1%	-5%: < 0%	-0.7: < -0.2	-0.8: < -0.2	0%:<+1.5%
	high risk	< 45%	< -1%	< -5%	< -0.7	< -0.8	<0%

Recession Risk Probability Estimates						
		ETI	**EMI**	**MMRI**	**CFNAI**	**ADS**
	low risk	0%:10%				
	medium-low risk	> 10%:30%				
	medium-high risk	> 30%:50%				
	high risk	> 50%				

Numerical range for signal summaries on p. 1