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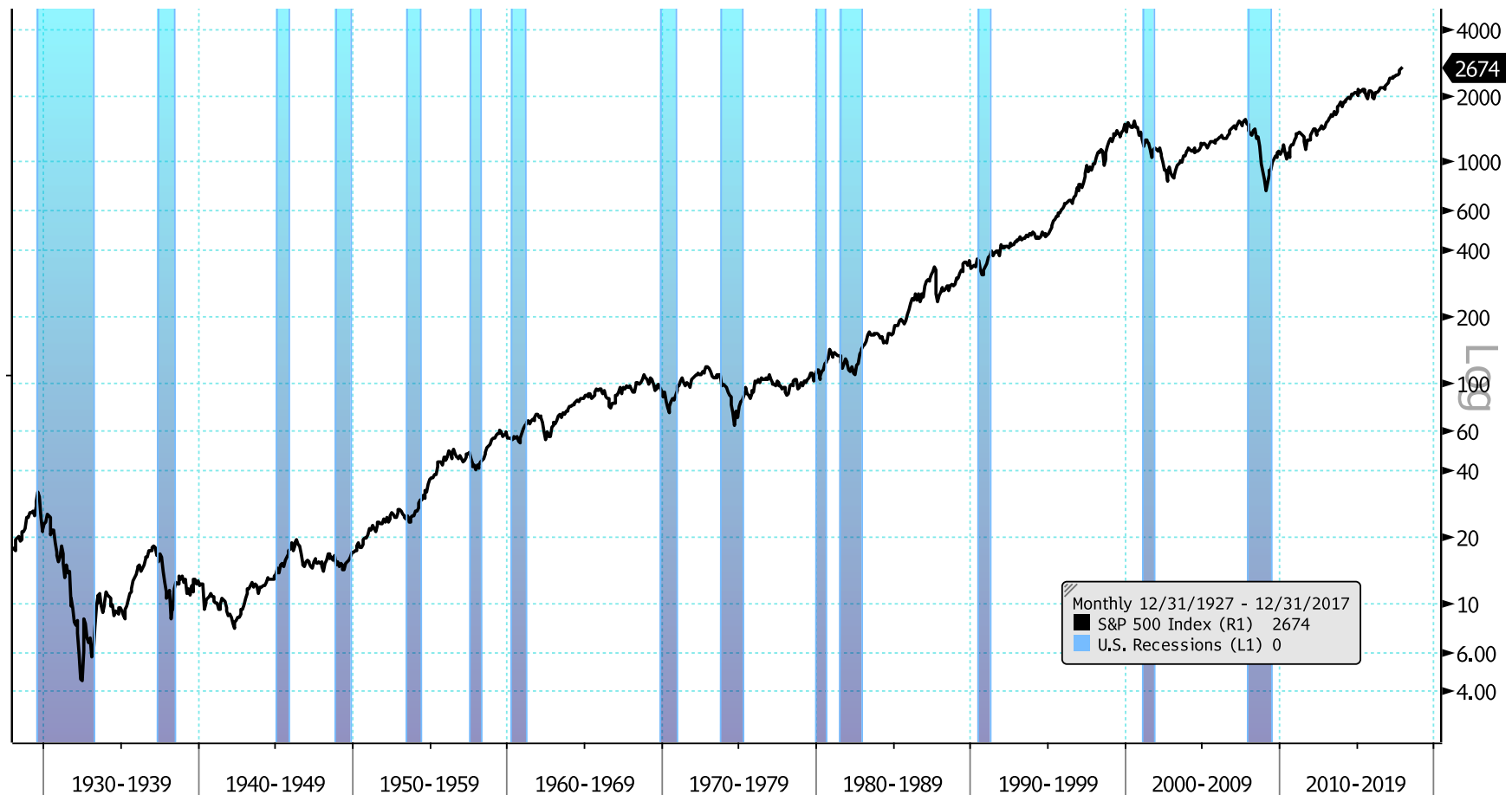
U.S. Business Cycle Chart Book

November 2018

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Why is the Business Cycle Important?

S&P 500 (log scale) and official National Bureau of Economic Research (NBER) U.S. Recessions

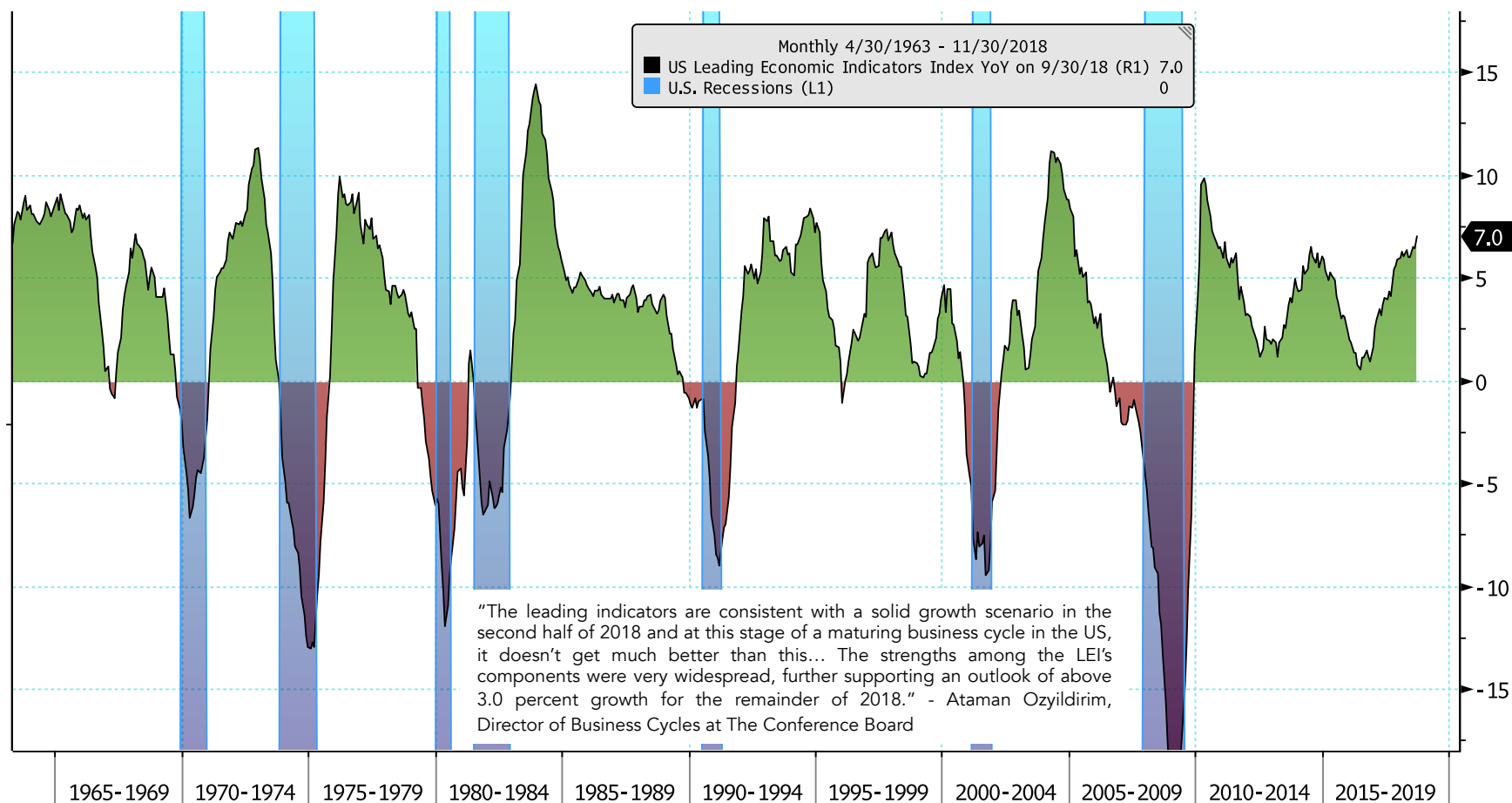


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*Analysis: Over the 90 years between 1927 and 2017, the average S&P 500 monthly return during expansions was +0.89% (889 months), compared to an average S&P 500 monthly return during recessions of -0.71% (191 months). In terms of proportions of time: expansion months account for about 80% and recession months about 20%. The business cycle also has important implications for Fed policy. *Note that recessions are not announced by the NBER until well after their start dates**

Leading Economic Indicators (LEIs) Index

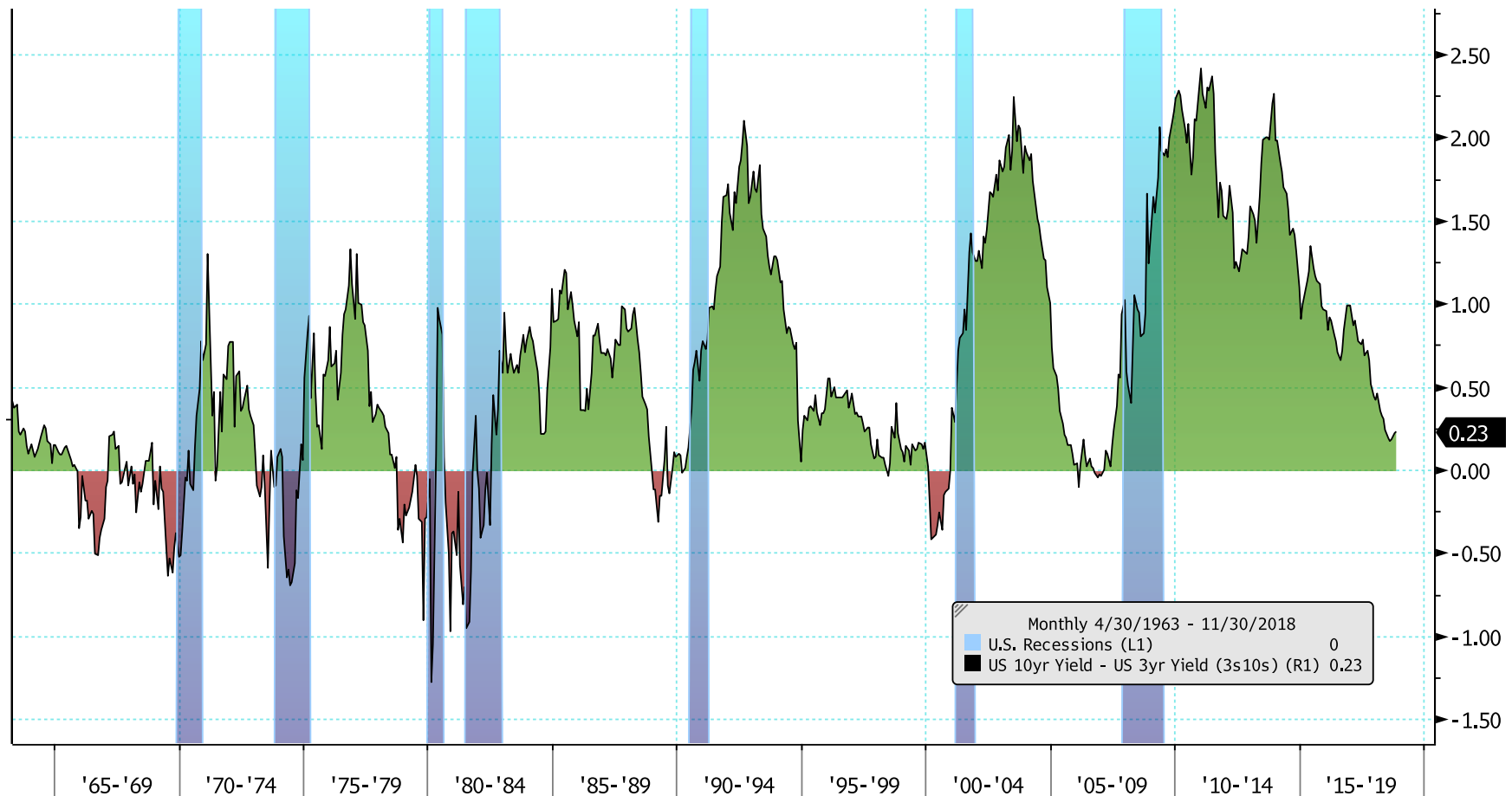
YoY rate of change of the Conference Board's LEI Index



Source: Bloomberg, © Merk Investments LLC www.merkinvestments.com/research

Analysis: Since last month's report the LEI YoY rate of change increased: from +6.3 to +7.0. The LEI Index is advancing at the fastest pace of this expansion with the exception of the initial recovery in early 2010, which had extreme base-effects at work. Given that the YoY rate of change is positive, history suggests a recession is unlikely to start within the next six months. Chart Framework: I'd get incrementally negative on the business cycle outlook if the LEI YoY went negative.

U.S. Yield Curve Steepness (10yr yield – 3yr yield)

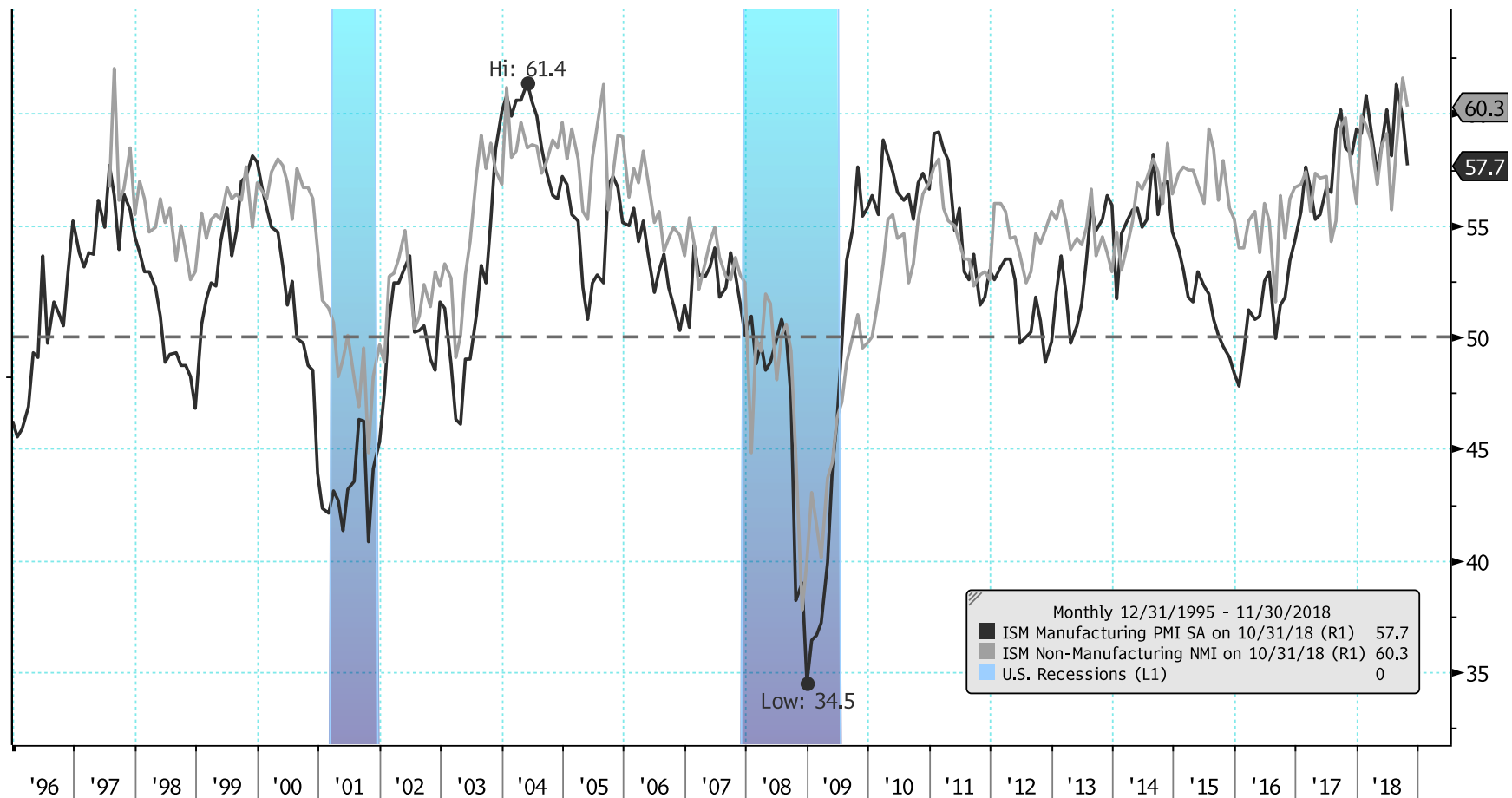


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Analysis: The yield curve is still positively sloped, meaning the 10yr yield is higher than the 3yr yield. The yield curve has flattened slightly since last month's report- in general the flattening trend continues and the curve may invert later this year or early next year. Chart Framework: I'd get incrementally negative on the medium term business cycle outlook if the yield curve inverted (i.e., 3yr yield > 10yr yield).

U.S. PMIs

Manufacturing and Non-manufacturing (aka Services) PMIs (Purchasing Managers Index)

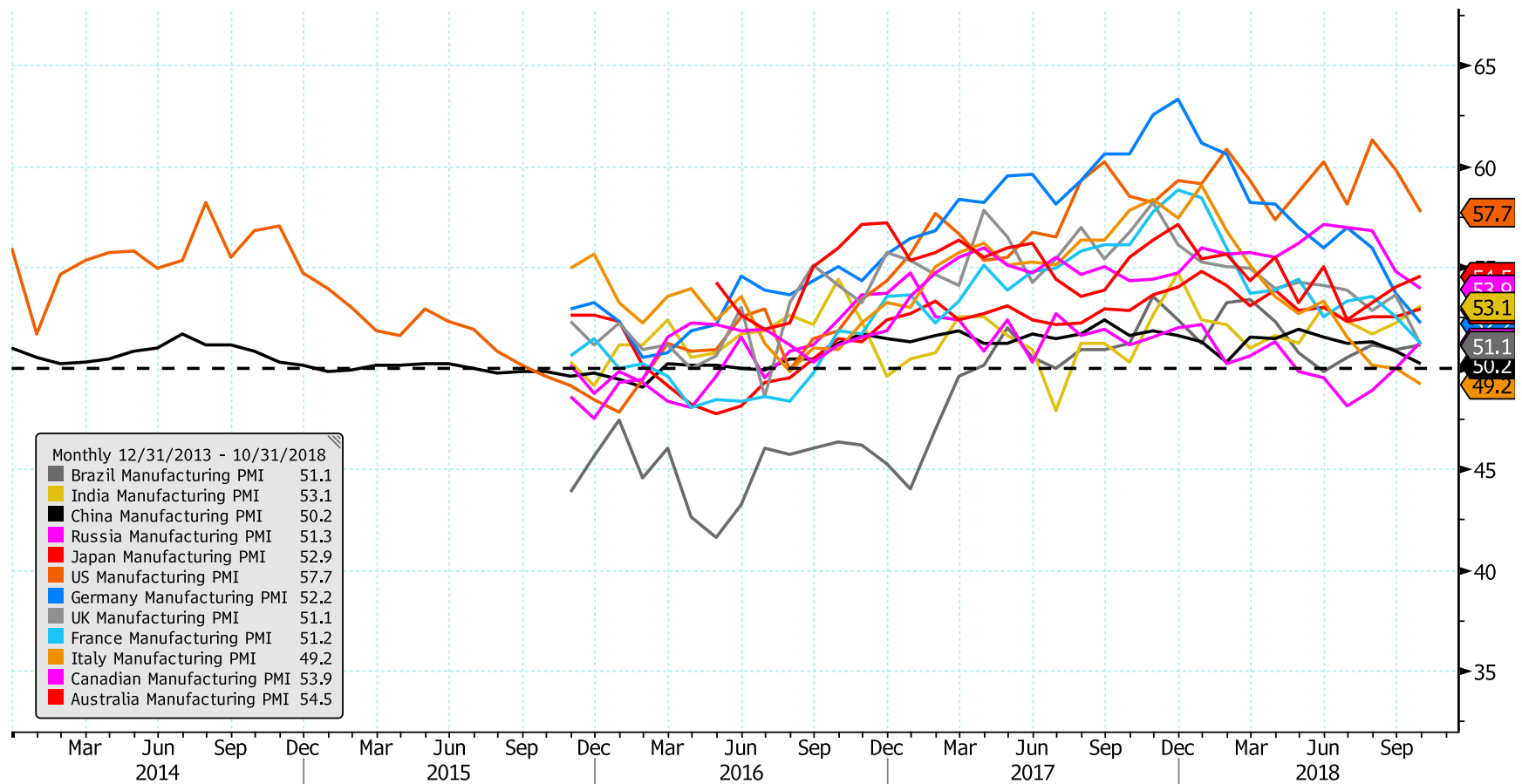


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*Analysis: Since last month's report manufacturing PMI ticked down from 59.8 to 57.7, still at a relatively high level.
Chart Framework: I'd get incrementally negative on the business cycle outlook if manufacturing PMIs fell below 50.*

Global PMIs

Largest global economies' Manufacturing PMIs (Purchasing Managers Index)

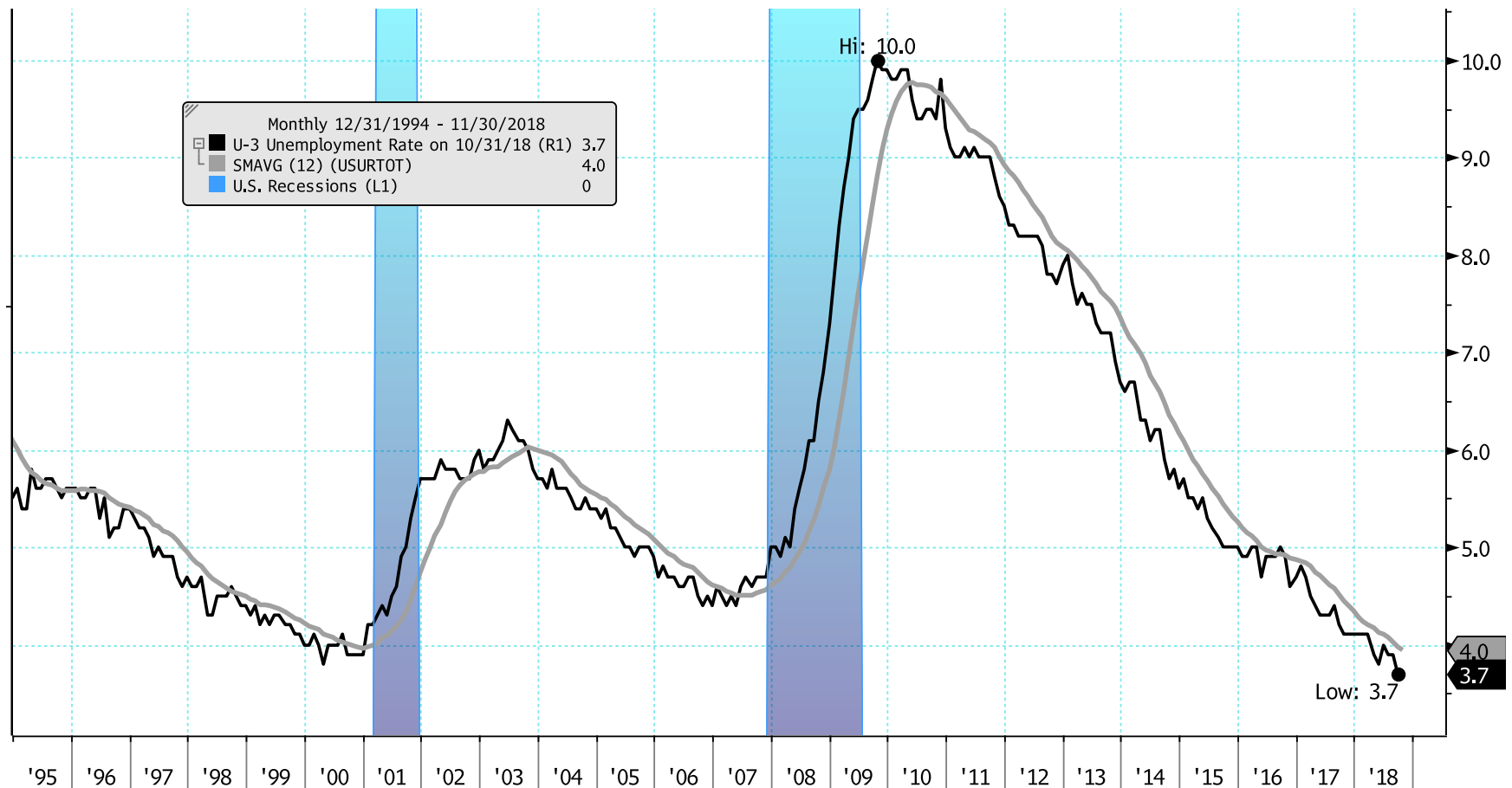
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Analysis: Global economic momentum was mixed over the past month. Italy's Manufacturing PMI fell below 50 and China's PMI has been trending lower and is close to the 50 level, which divides expansion from contraction.

Chart Framework: I'd get incrementally negative on the business cycle outlook if China, India, Germany or Japan manufacturing PMIs fell below 50.

U.S. Unemployment Momentum

U-3 Rate and U-3 12 month Moving Average



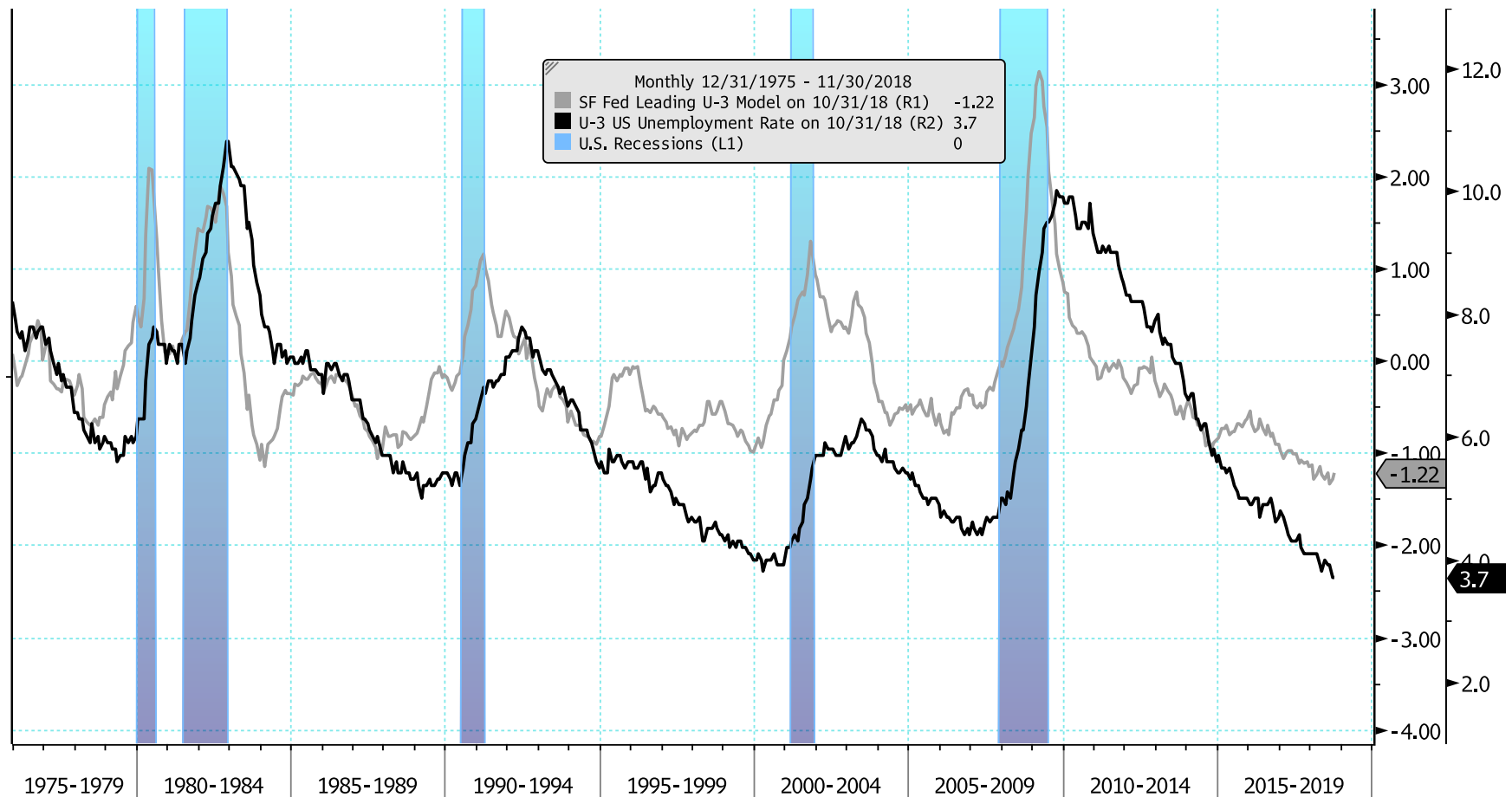
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Analysis: The unemployment rate remained stable at 3.7%, still well below the 12-month moving average (with the labor force participation rate ticking higher – not shown).

Chart Framework: I'd get incrementally negative on the business cycle outlook if the unemployment rate moved above its 12m MA while the labor force participation rate trended lower.

SF Fed Leading Unemployment Rate (U-3) Model

Replica of San Francisco Fed Model (grey) and U-3 Unemployment Rate (black)



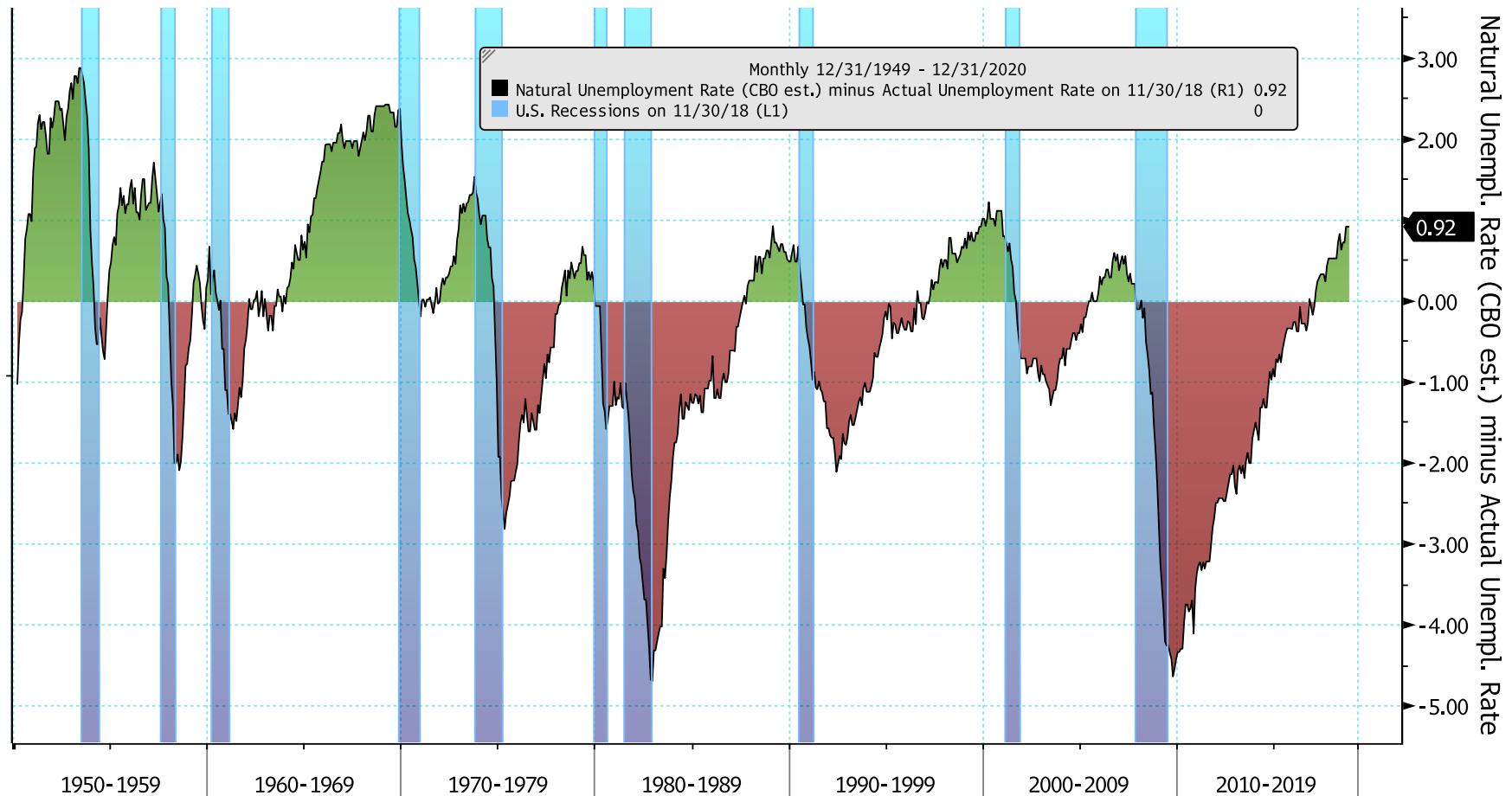
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Analysis: The SF Fed unemployment rate model (grey line) continues to trend lower, which suggests the U-3 rate (black line) should continue to trend lower as well.

Chart Framework: I'd get incrementally negative on the business cycle outlook if the SF Fed model line trends higher on a YoY basis.

U.S. Labor Market Capacity Utilization

Natural Rate of Unemployment (CBO est.) – Actual Rate of Unemployment



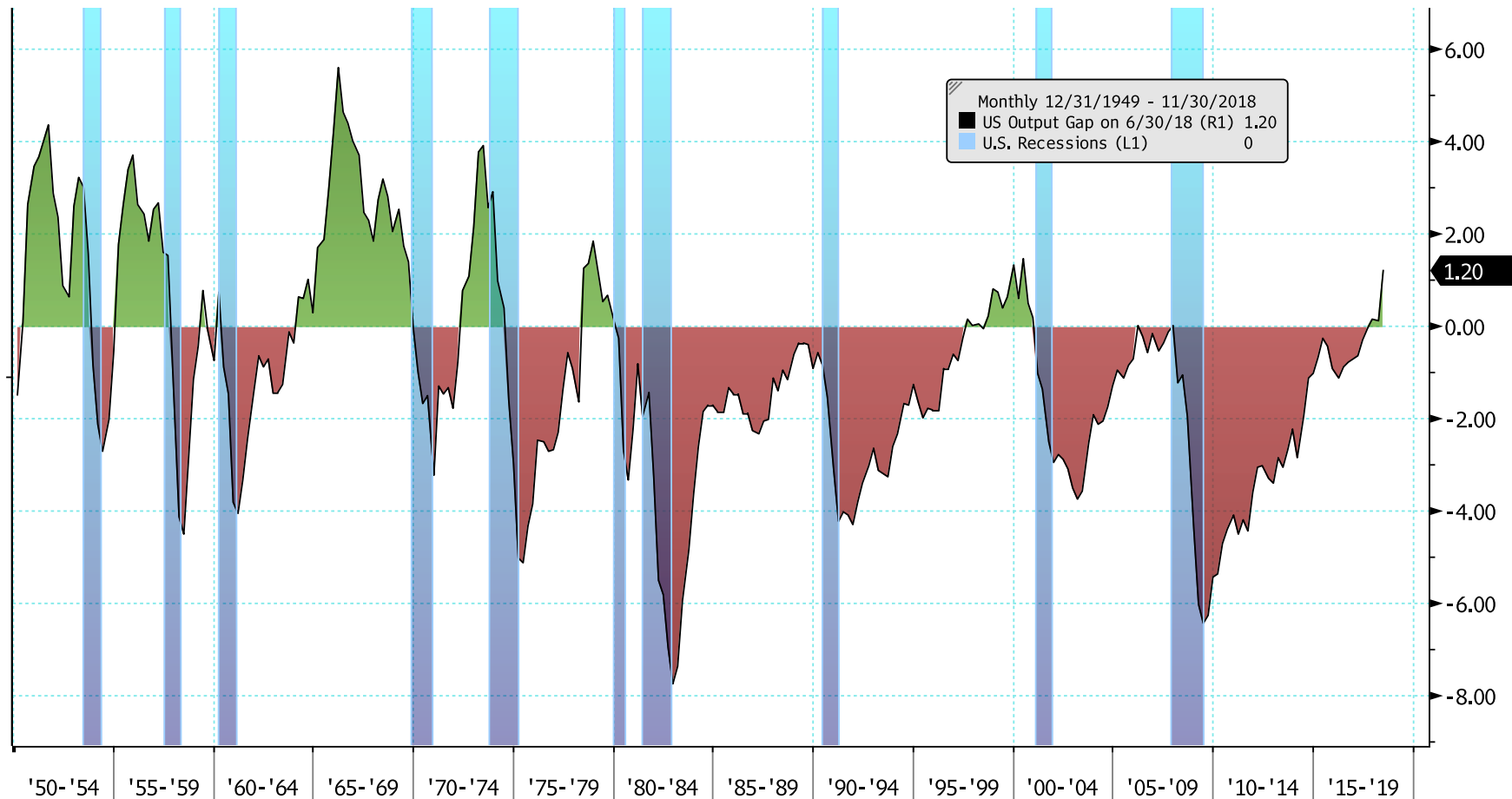
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Analysis: The estimated natural unemployment rate is higher than the current unemployment rate (4.62% – 3.7%), meaning the U.S. economy is potentially running above capacity, which likely increases the risk of a recession roughly 1-5 years out.

Chart Framework: I'm currently incrementally negative on the business cycle outlook medium/longer term based on this picture, I'd get incrementally positive medium/longer term around -1.00 on the chart, which would likely only be during or after a recession.

U.S. GDP Output Gap

Actual GDP minus Potential GDP (CBO est.)

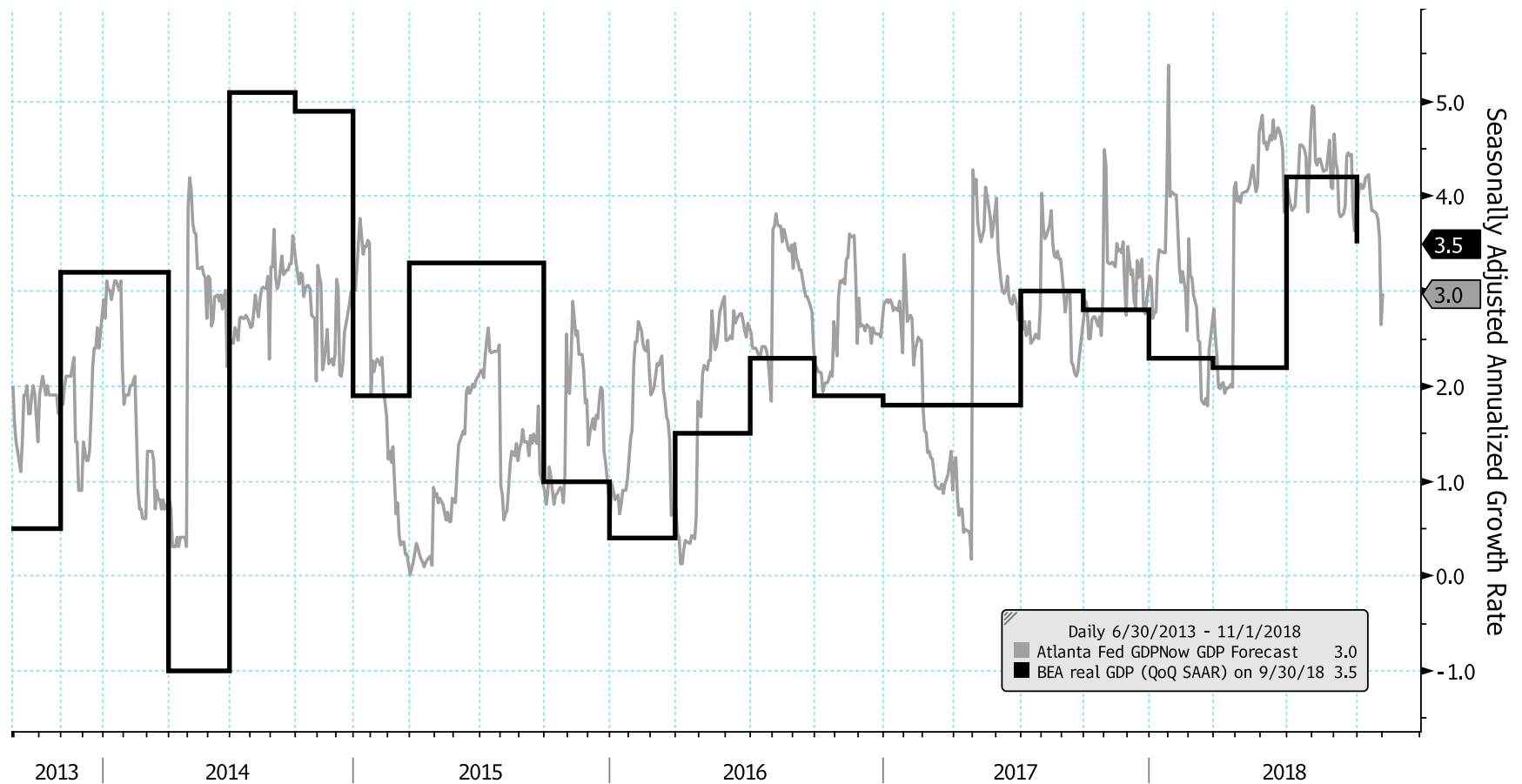


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*Analysis: Actual GDP is now more than potential GDP (as estimated by the CBO), which suggests the expansion may be entering its final stages.
 Chart Framework: I'm currently incrementally negative on the business cycle outlook medium/longer term based on this picture, I'd get incrementally positive medium/longer term around -2.00 on the chart, which would likely only be during or after a recession.*

Atlanta Fed GDPNow GDP Forecast

GDPNow Forecast and the official QoQ SAAR from BEA

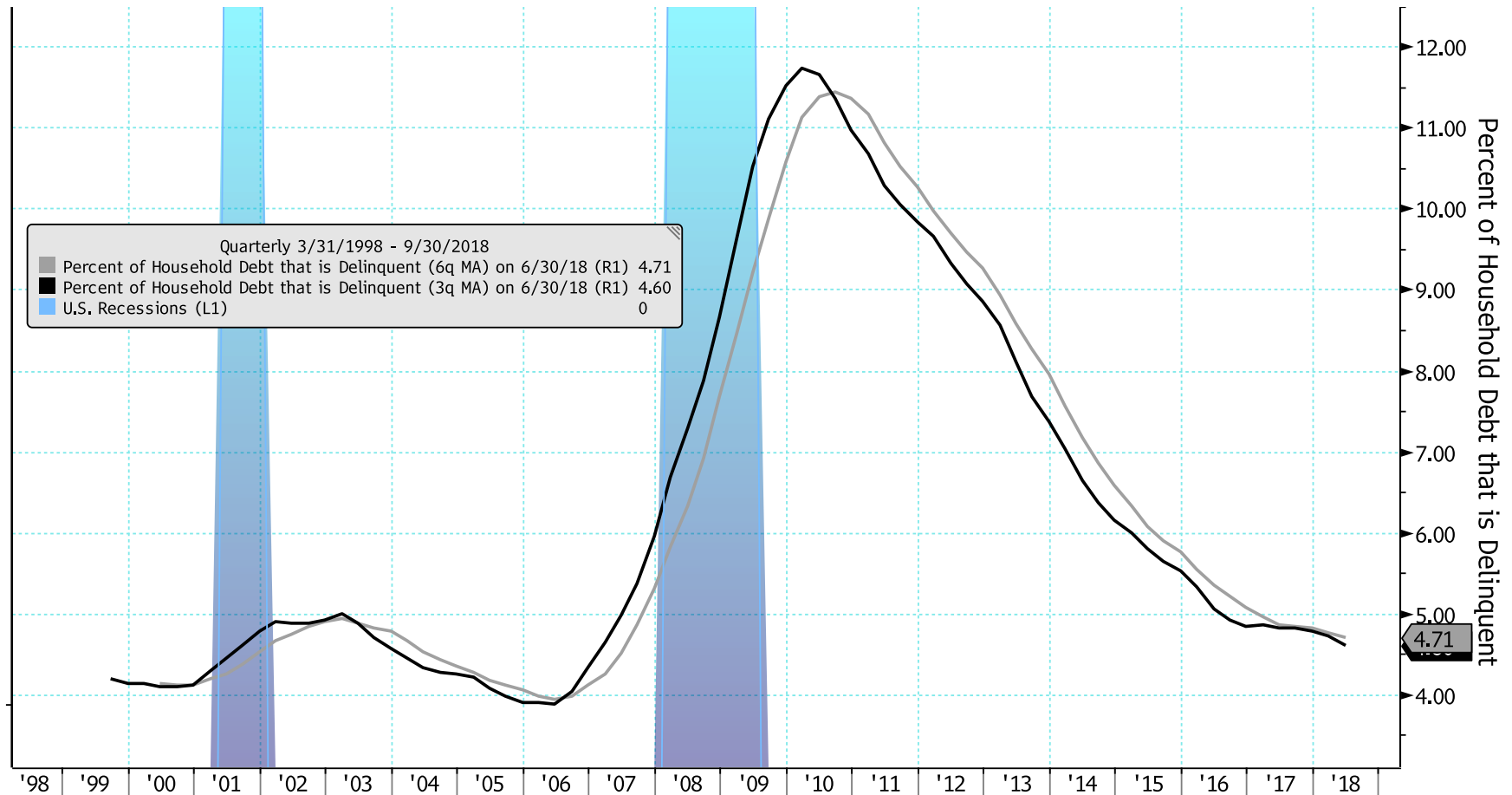


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Analysis: The initial Q3 GDP reading (black line) came in at 3.5%, the current forecast for Q4 GDP is 3.0%.
Chart Framework: I'd get incrementally negative on the business cycle outlook if the Atlanta Fed GDP indicator fell below zero.

U.S. Household Credit Cycle

Percent of Household Debt that is Delinquent (3 quarter and 6 quarter moving averages)



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Analysis: The Q2 2018 data showed a further decline in the household delinquency rate, which is a positive sign for the economy.

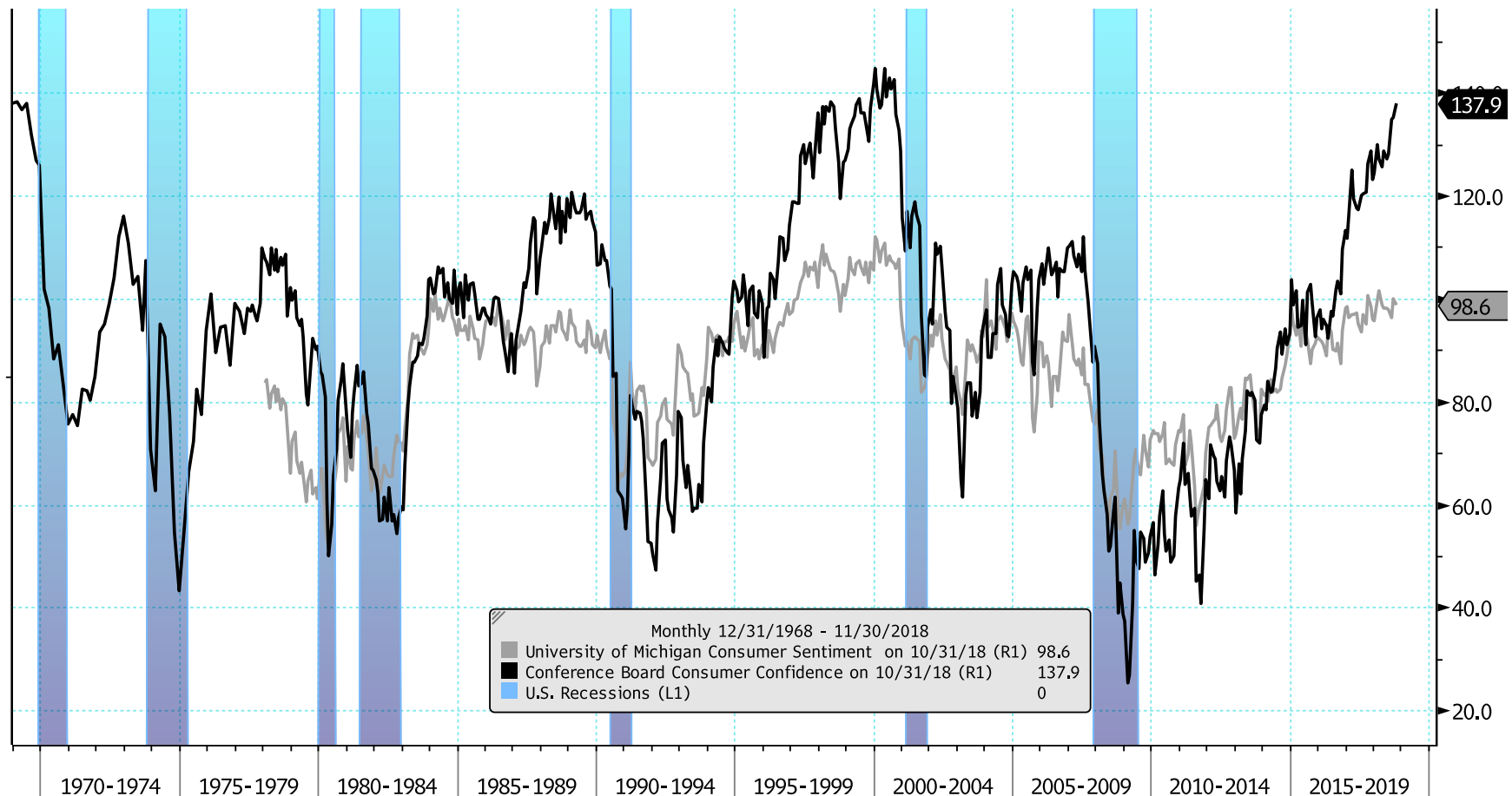
The household credit cycle is still going: 3-quarter moving average (black) < 6-quarter moving average (grey).

Chart Framework: I'd get incrementally negative on the business cycle outlook if the 3q MA rose above the 6q MA.

The Q3 2018 data comes out in late November.

U.S. Consumer Confidence

Michigan Consumer Sentiment and Conference Board Consumer Confidence

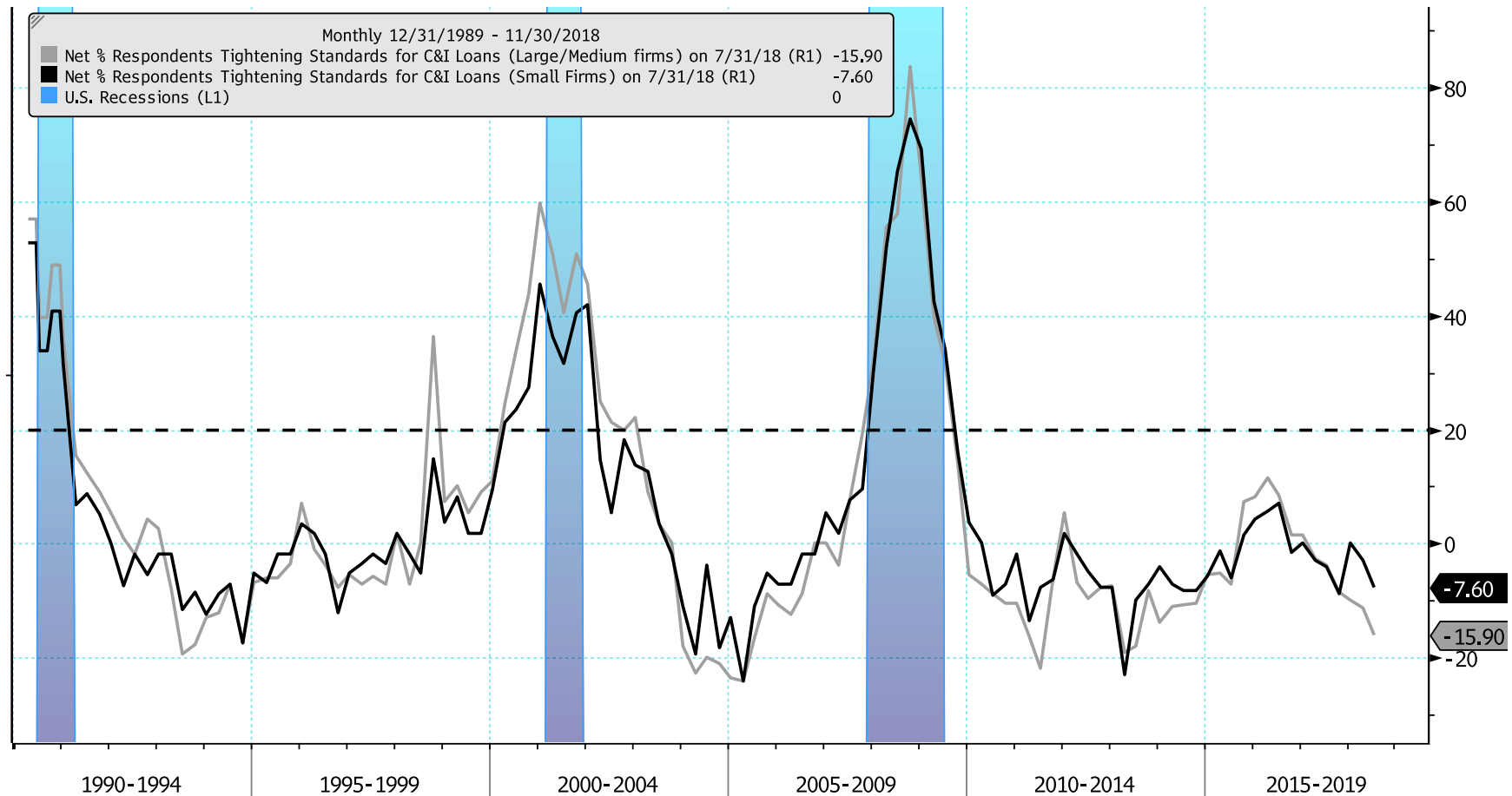


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Analysis: The Conference Board measure of consumer confidence is still trending higher, a near term positive; however, the University of Michigan consumer reading is trending sideways. At elevated levels consumer confidence measures can act as a contrarian indicator over the medium term. Chart Framework: I'd get incrementally negative on the business cycle outlook if both measures started trending lower on a YoY basis.

Bank Lending Standards

Senior Loan Officer Opinion Survey (SLOOS): Net % of Respondents that are Tightening Lending Standards for Commercial and Industrial (C&I) Loans

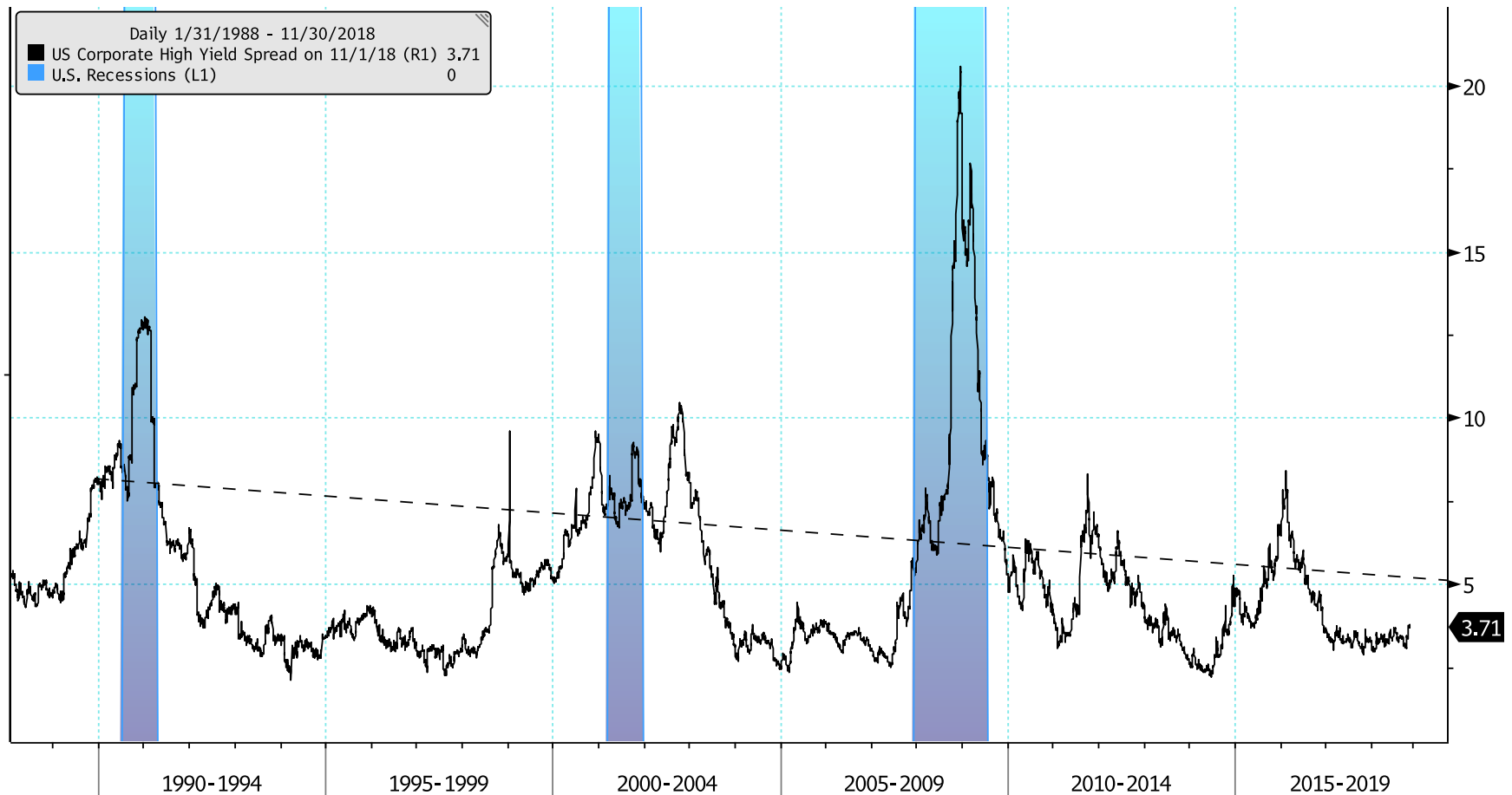


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*Analysis: Data from the Fed's Senior Loan Officer Opinion Survey suggest bank lending standards continue to be supportive of economic activity.
Chart Framework: I'd get incrementally negative on the business cycle outlook if 20% of respondents report tightening lending standards.*

High Yield Spread

US High Yield Spread with Trend Line

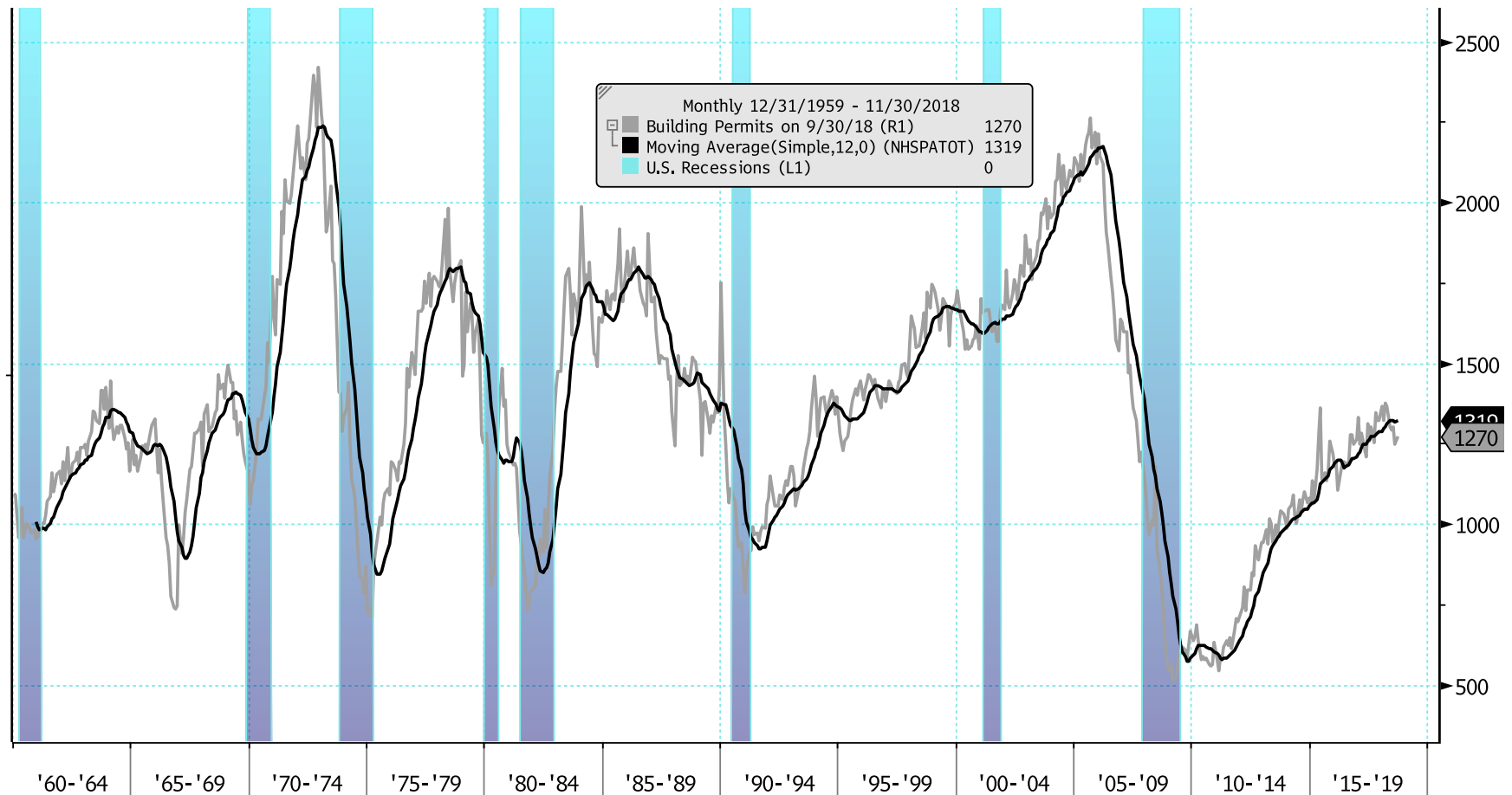


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Analysis: The high yield credit spread has risen since last month's report, and briefly rose above its multi-year 2.90 to 3.75 range, but has since fallen back into that range. Worth noting is that historically the high yield spread has had a tendency to rise substantially shortly after yield curve inversion. Chart Framework: I'd get incrementally negative on the business cycle outlook if the spread moves above 5.

U.S. Building Permits

U.S. Building Permits and 12-month Moving Average



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Analysis: Building permits, historically a long leading indicator, are starting to look like they might be topping for the cycle- another potential late cycle indicator if they begin to trend lower in earnest. Higher mortgage rates are likely contributing to the slowing demand for housing. Framework: I would get negative if the 12-month moving average is trending down for several consecutive months.

Checklist (November 2018)

Page	Chart	Time Horizon	Per Framework Outlook on Business Cycle
3	LEIs	Short/Medium Term	Positive
4	Yield Curve	Medium Term	Positive
5	U.S. PMIs	Short/Medium Term	Positive
6	Global PMIs	Short/Medium Term	Neutral/Positive
7	U-3 v 12m MA	Medium Term	Positive
8	SF Fed U-3	Medium Term	Neutral/Positive
9	Labor Force Capacity Util.	Medium/Longer Term	Negative
10	Output Gap	Medium/Longer Term	Negative
11	GDP Forecast	Short Term	Positive
12	Household Credit	Medium Term	Positive
13	U.S. Consumer	Short/Medium Term	Neutral
14	Lending Standards	Medium Term	Positive
15	High Yield Spread	Short/Medium Term	Positive
16	U.S. Building Permits	Medium/Longer Term	Neutral
		Time Horizon	Overall Outlook on Business Cycle
		Short Term (<6 months)	Positive with low/medium uncertainty
		Medium/Longer Term (6m - 5 years)	Neutral/Negative with high uncertainty

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Conclusion/Thoughts

Data developments since last month's report have been mixed, but overall the economic expansion looks set to continue over the next few months, and in general until further notice. All of these charts or concepts are somewhat inter-related, as is the economy in general, so the idea is to have some different data points to cross-reference- in my view no one indicator can be looked at in isolation. That being said, almost all indicators are still positive, with the exception of some longer term indicators that look negative.

The LEI Index looks very strong and the yield curve is still a ways away from potentially inverting- it's worth keeping in mind that yield curve inversion is historically a medium term indicator (6-24 months) with respect to the beginning of a subsequent recession.

Recession risk over roughly the 1-5 year period has likely increased with measures suggesting the economy is potentially operating above capacity, namely the output gap and labor force capacity utilization. Operating above capacity can persist for some time but is by definition unsustainable over the longer term, however there are uncertainties with regards to the estimates for potential GDP and the natural rate of unemployment. Also, some longer leading indicators such as auto sales and building permits appear to be rolling over, which adds to the evidence that the economy is in a late cycle phase. However, for the time being, there seems to be some slack remaining in the labor market, which suggests that the economic cycle can continue for a little while longer.

In general the data suggests classic late-upswing business cycle behavior. According to the CFA text, a late upswing means "at this stage of the business cycle, the output gap has closed and the economy is in danger of overheating. Confidence is high; unemployment is low. The economy may grow rapidly. Inflation starts to pick up, with wages accelerating as shortages of labor develop." (See the Inflation and Fed chart books for analysis on inflation and wages.)

To reiterate, taken together I think the U.S. business cycle picture is still positive. On balance, based on the charts and framework presented (which inevitably may not capture all possible risk factors in real-time), it seems likely the U.S. economic expansion continues until further notice.

-Nick Reece, CFA

Disclosure

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