

Outlook for oil prices in 2019

Mid-year update

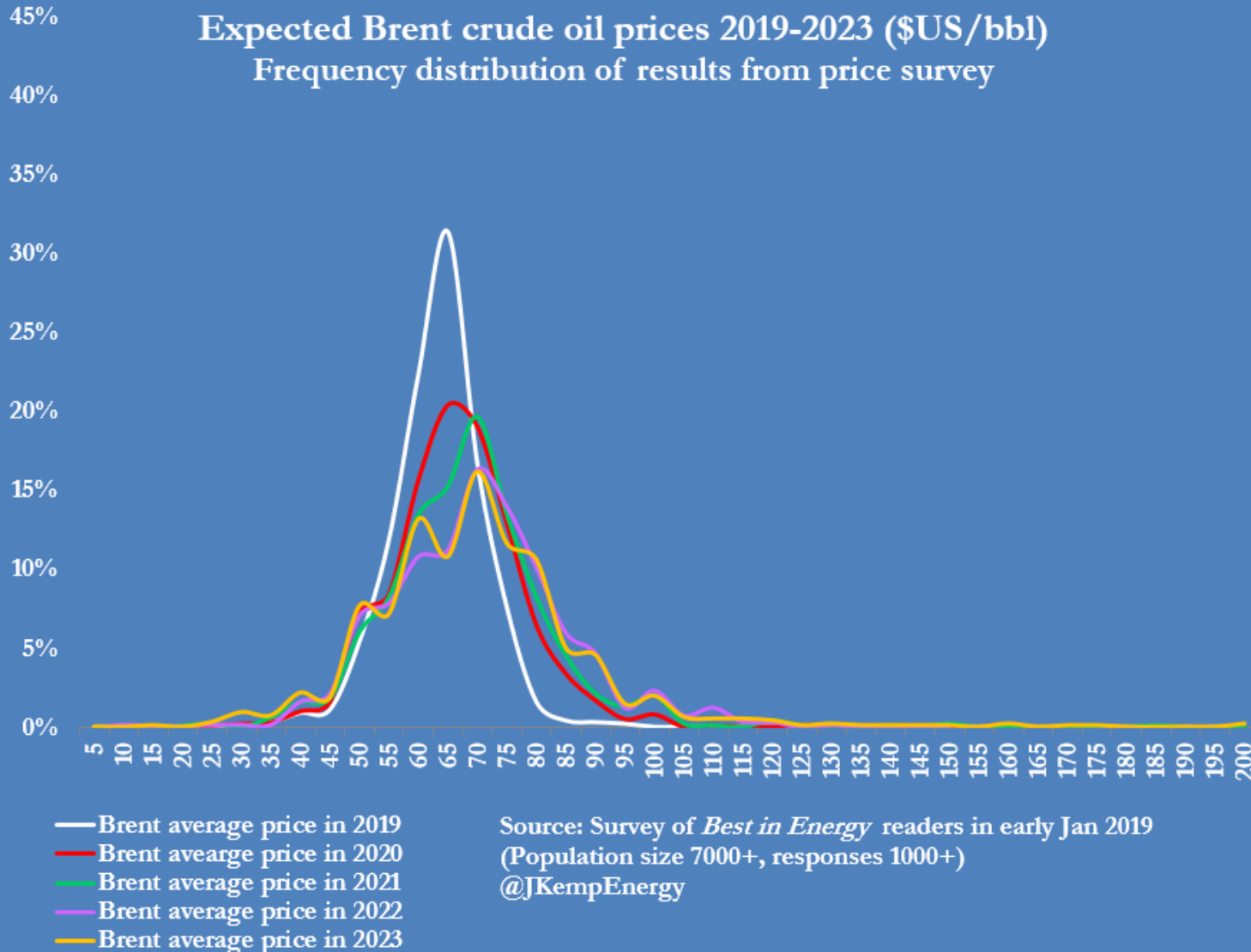
JOHN KEMP

REUTERS

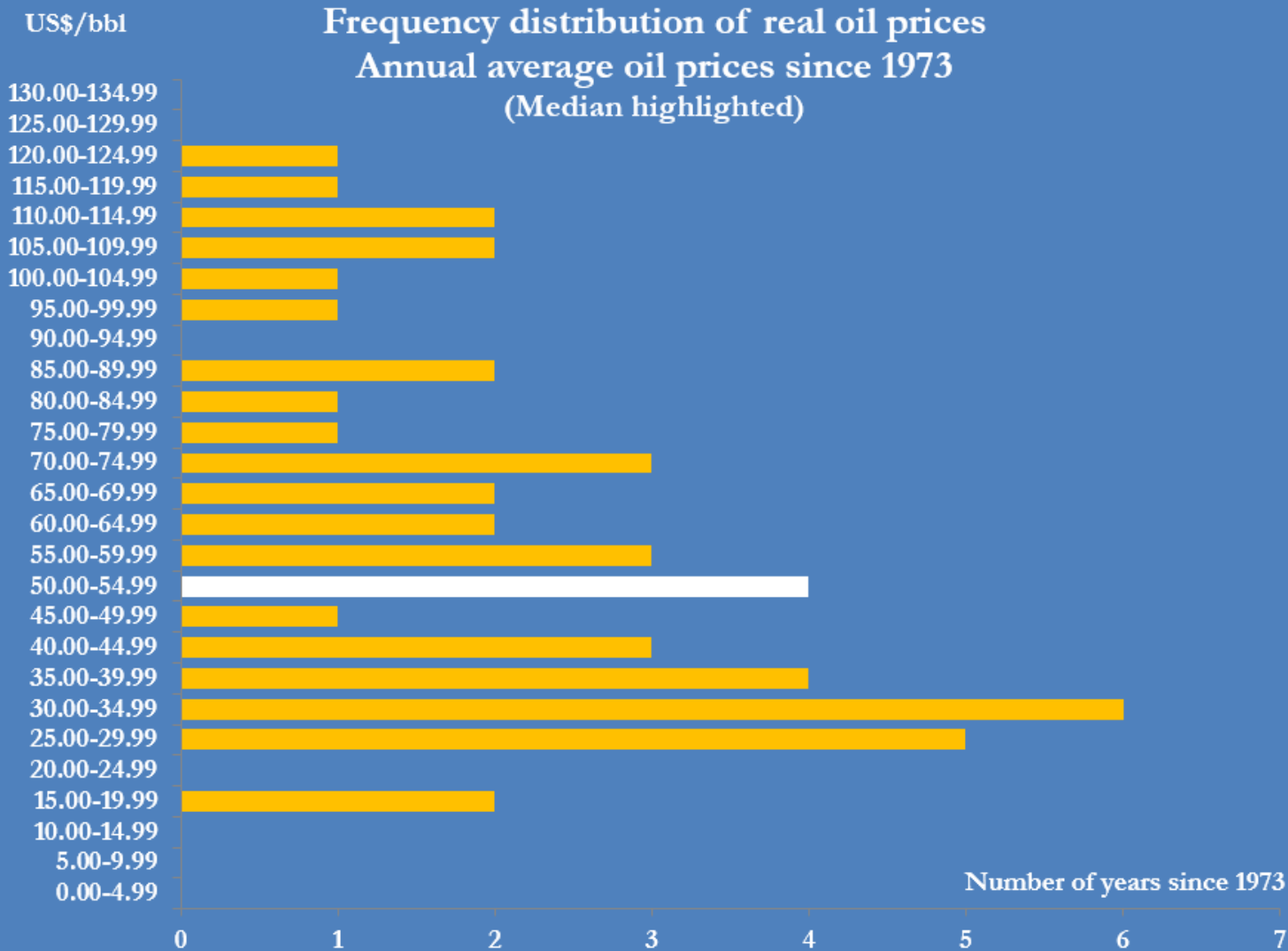
5 June 2019

Brent crude price expected to average around \$65 per barrel in 2019

Forecasts tightly clustered, price not expected to rise much through 2023



Brent has averaged \$67 so far this year, down from \$72 in 2018
Real prices are (just) in the top half of the distribution since 1973

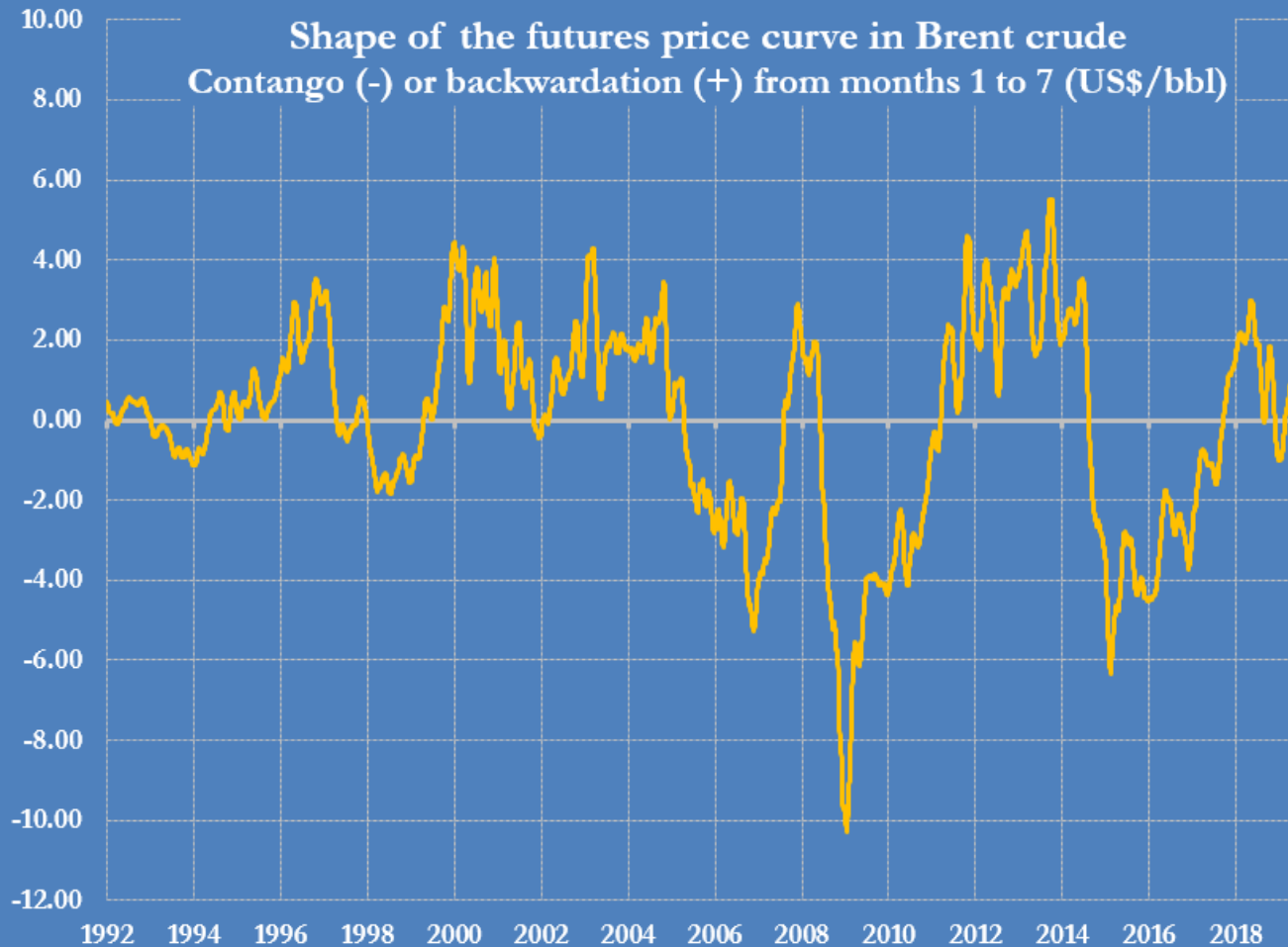


Source: *BP Statistical Review of World Energy, 2018* and author calculations

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Brent six-month calendar spread in significant backwardation

Traders expect market to be mildly under-supplied in H2 2019 and into 2020



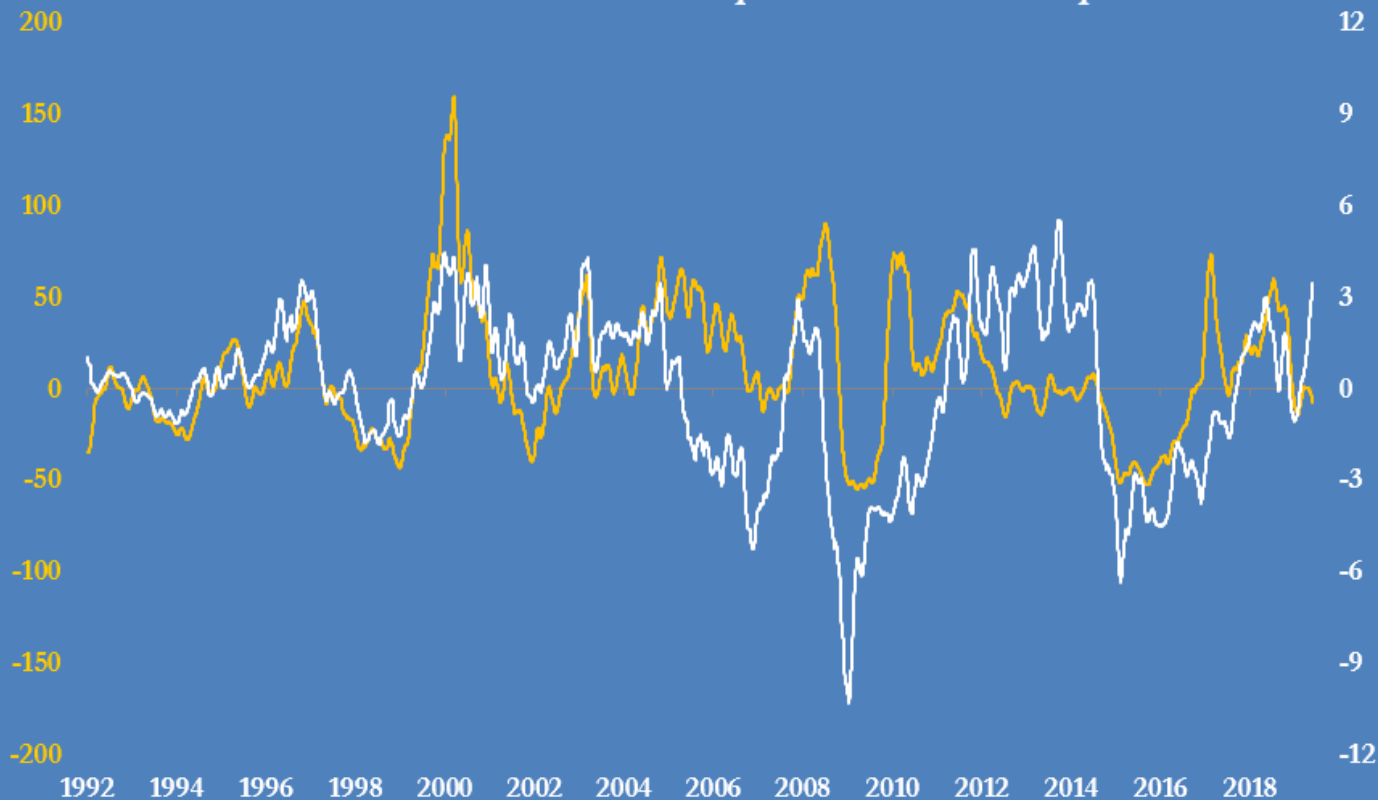
Price difference between 1st listed contract month and 7th listed contract month for Brent futures (U.S.\$/bbl)
Contango (-) or backwardation (+) averaged over 30 days

Source: Thomson Reuters Eikon, ICE Futures
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Brent spot price and spreads recently pointed in opposite directions

Slumping spot prices point to over-supply, tight spreads point to under-supply

Cyclical indicators in the oil market, 1992-2019
Brent crude: front-month futures prices and calendar spreads



— L-axis: Brent front-month futures prices (percent change year-on-year)

— R-axis: Brent calendar spread (1st month - 7th month future price, U.S.\$ per bbl)

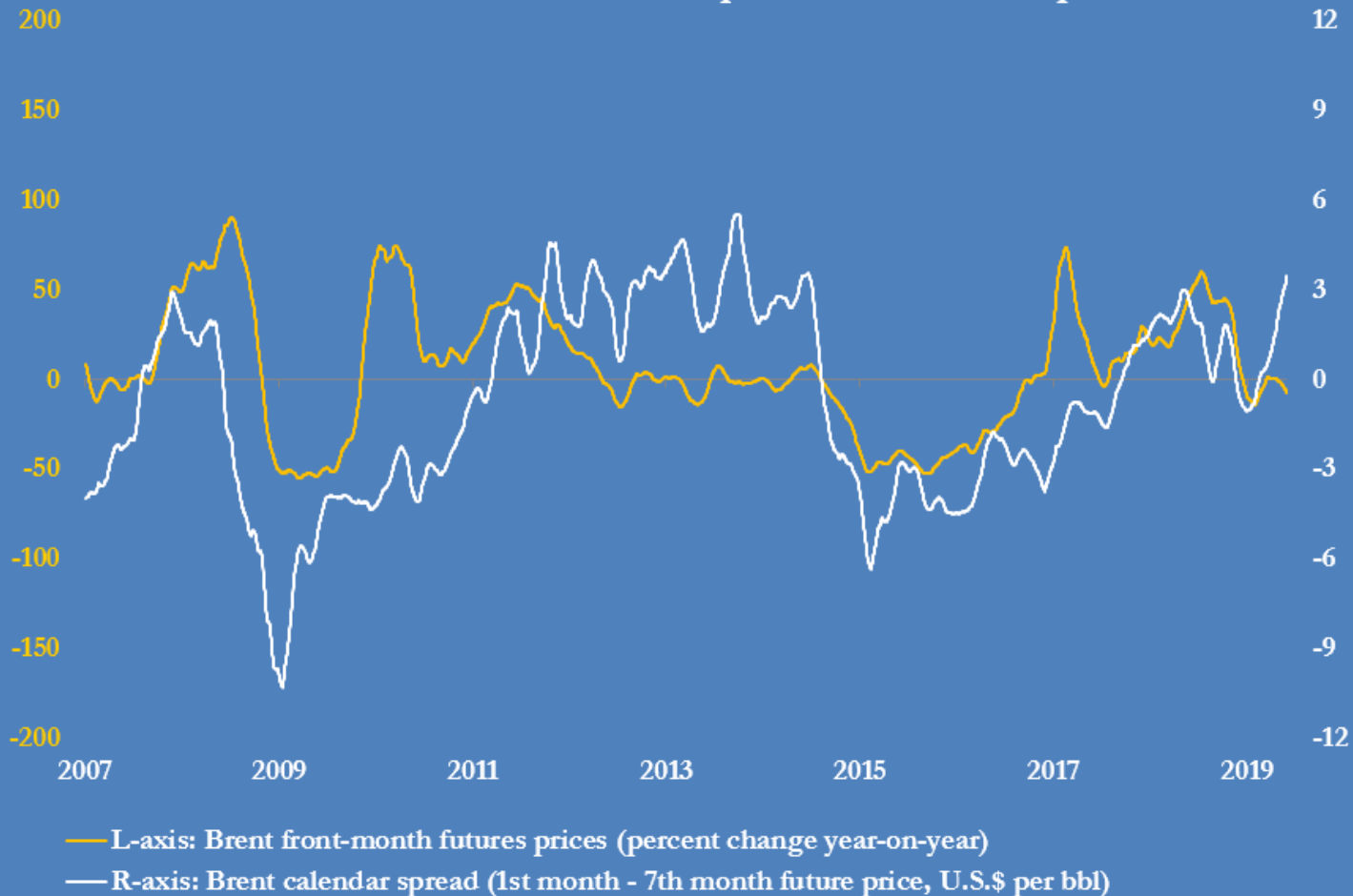
Both series are averaged over 30 trading days to smooth short-term volatility

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Spot prices and spreads will have to converge

Spreads currently softening

Cyclical indicators in the oil market, 2007-2019
Brent crude: front-month futures prices and calendar spreads



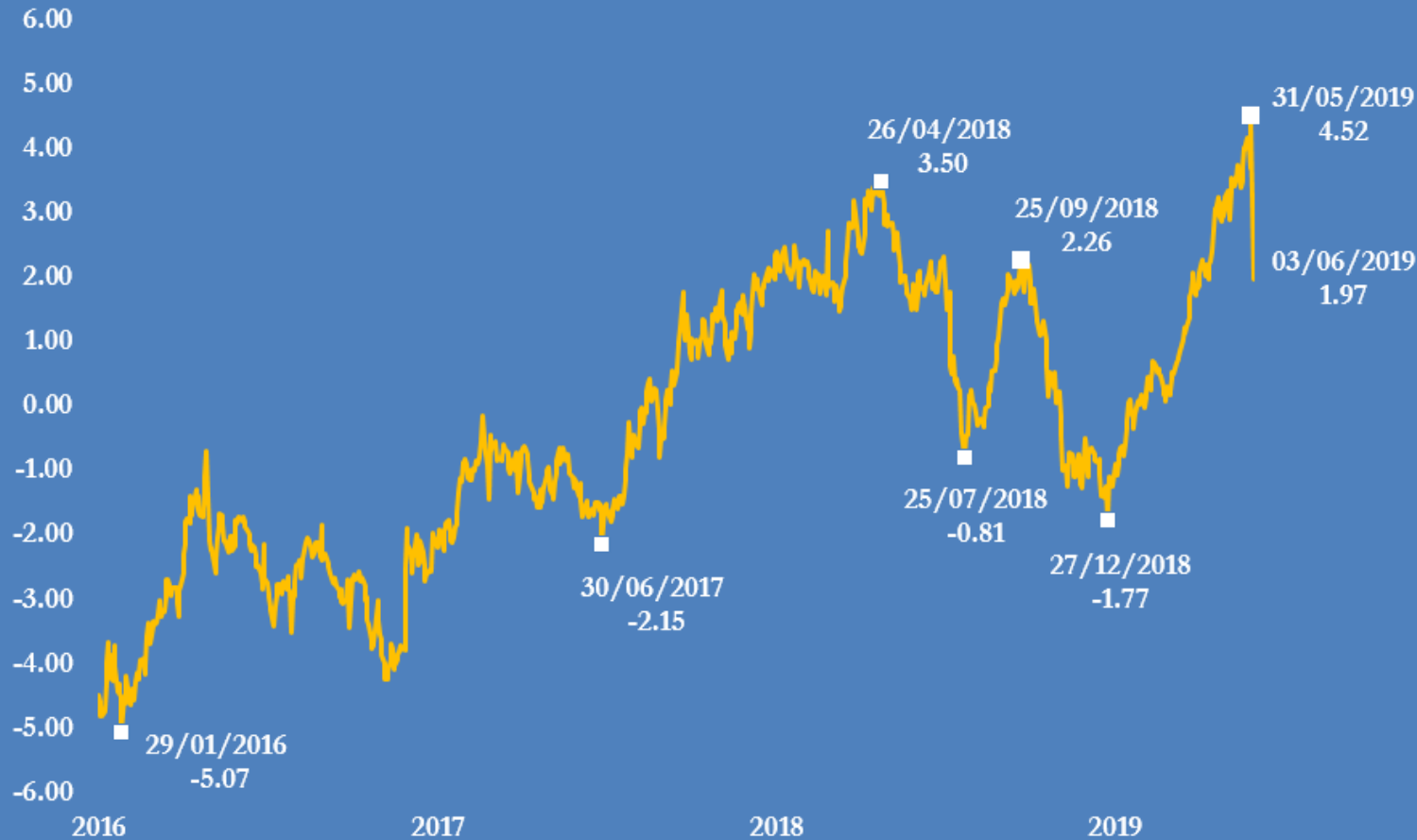
Both series are averaged over 30 trading days to smooth short-term volatility

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Brent calendar spread has eased substantially in recent sessions

Extreme tightness concentrated in Jun-Jul-Aug, result of pipeline problem etc

Shape of the futures price curve in Brent crude
Contango (-) or backwardation (+) from months 1 to 7 (US\$/bbl)



Price difference Brent month 1 and month 7 (U.S.\$/bbl)
Contango (-) or backwardation (+)

Source: ICE Futures, @JKempEnergy

Principal influences on oil prices in 2019

External variables

(mostly independent of oil prices)

(1) Global economy

- ❖ U.S./China trade war
- ❖ Financial conditions
- ❖ Global business cycle

- ❖ Oil-exporting countries
- ❖ Commodity-dependent economies

Internal variables

(mostly dependent on oil prices)

(2) U.S. shale production growth

- ❖ Reaction to lower prices

(3) OPEC+ output reductions

- ❖ Reaction to lower prices
- ❖ Group discipline
- ❖ Trump pressure

(4) U.S. sanctions on Iran

- ❖ Renewal of waivers
- ❖ Availability of replacement bbl
- ❖ Price impact

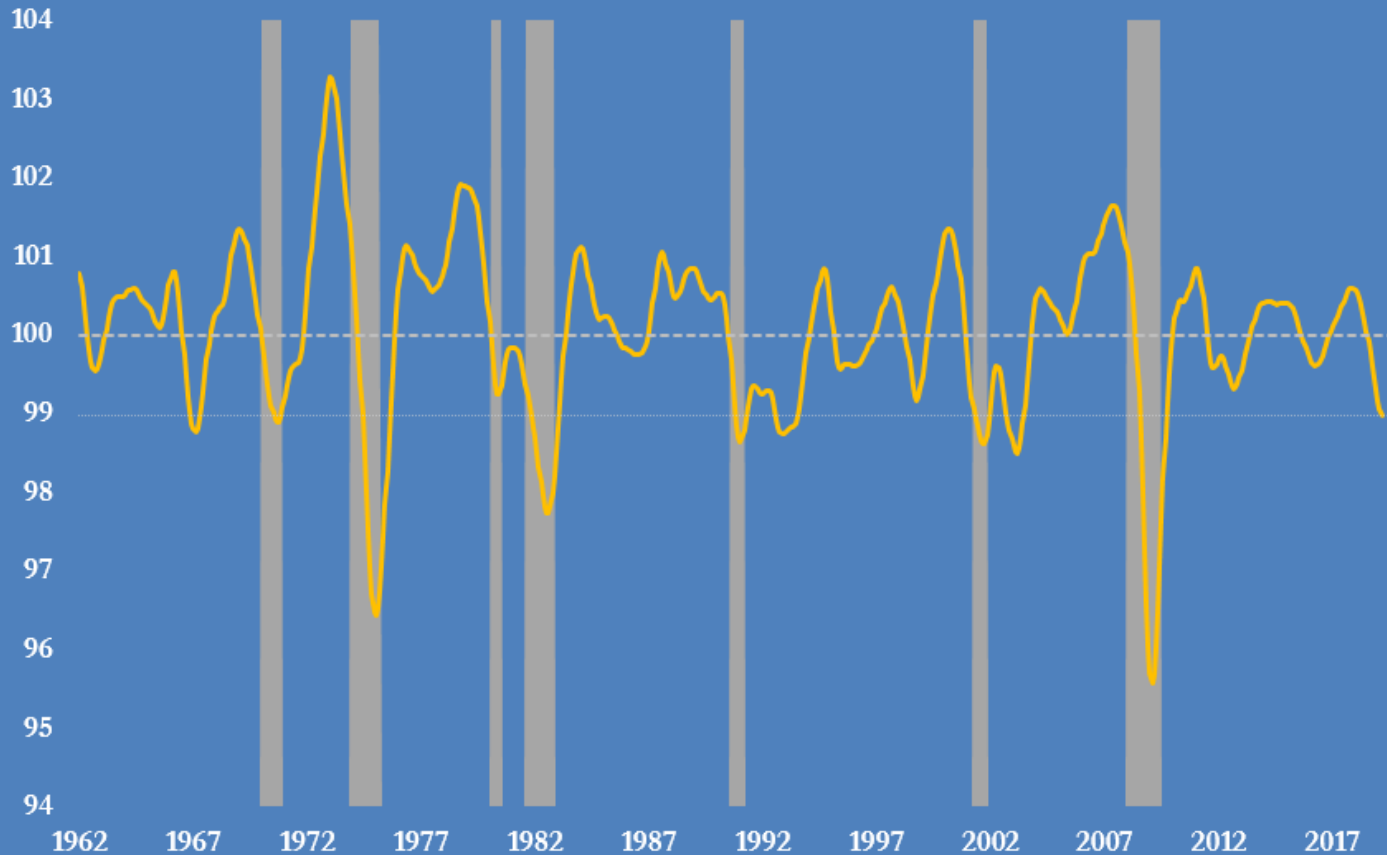
(5) U.S. sanctions on Venezuela

- ❖ Availability of replacement bbl

Global economic growth has slowed sharply over the last year

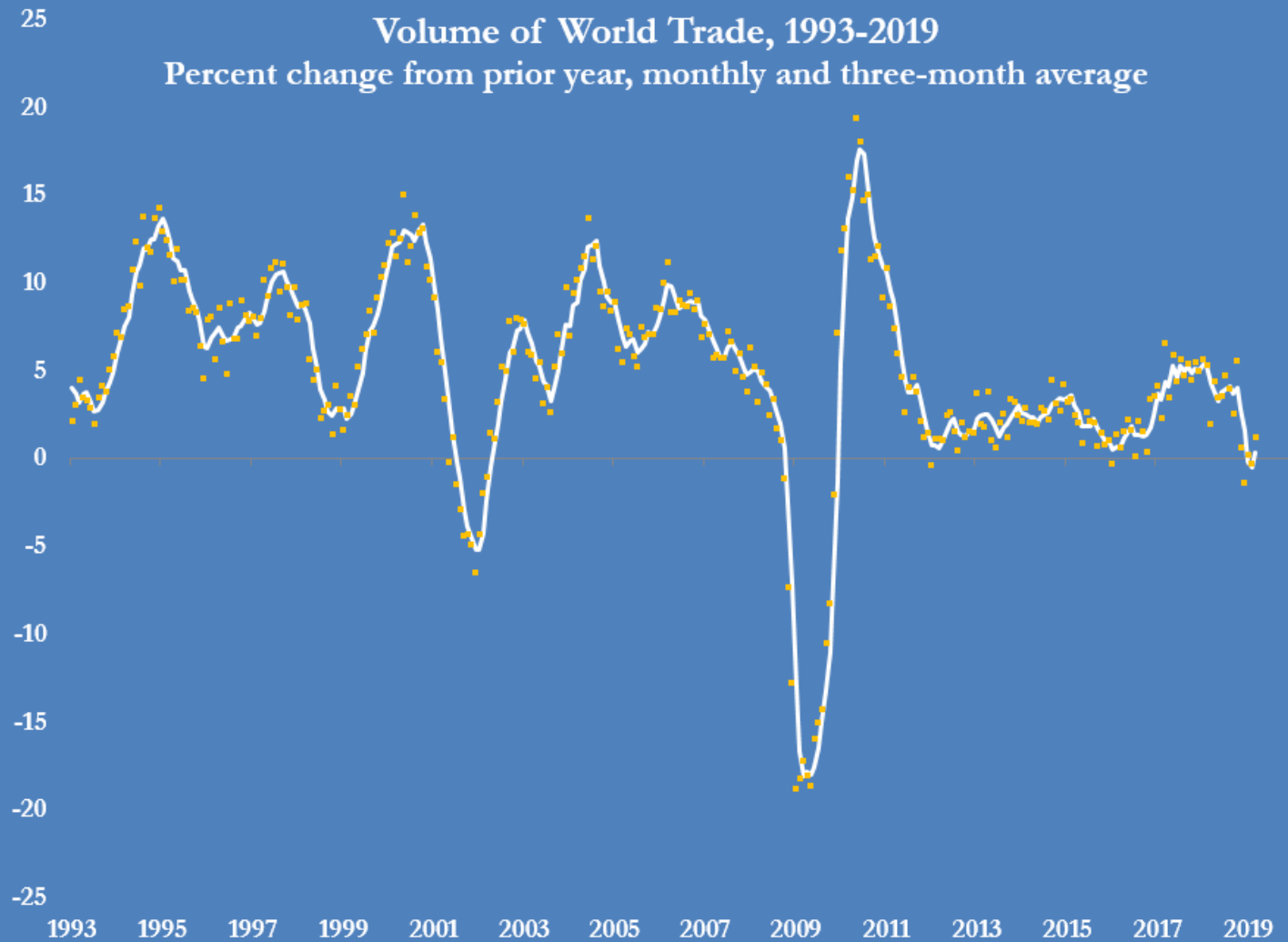
OECD leading indicator has fallen to level normally associated with recession

OECD Composite Leading Indicator, 1962-2018
Long-term trend = 100, NBER U.S. recessions shown



World trade growth has decelerated

Worst performance since the end of the Great Recession in 2008/09



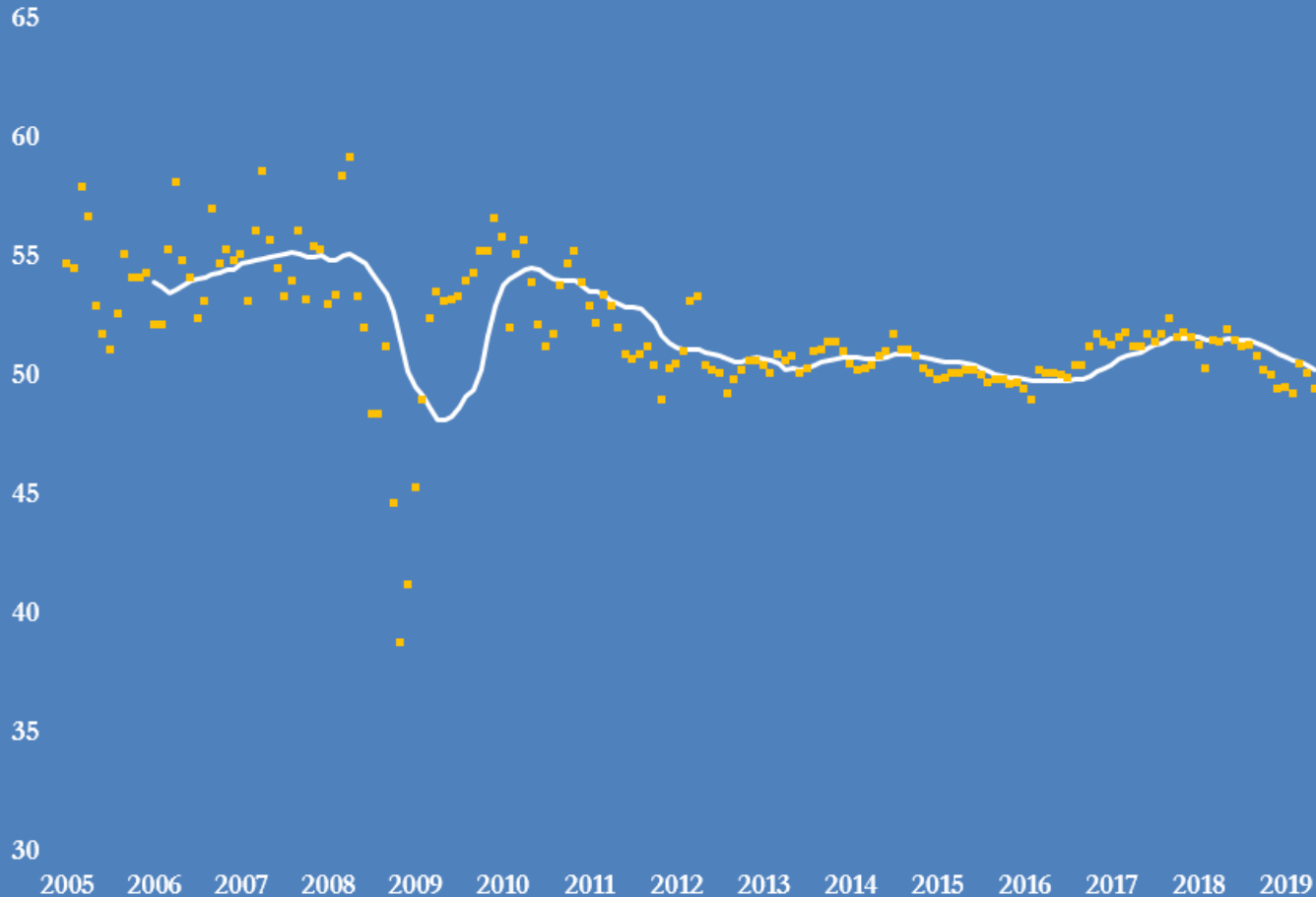
Source: Netherlands Bureau for Economic Policy Analysis, *World Trade Monitor*

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China's manufacturers report falling activity

Sharp slowdown since May 2018

China purchasing managers' index, 2005-2019
Manufacturing sector, monthly and 12-month average



U.S. manufacturing growth has slowed since Aug 2018

ISM manufacturing index shows sharp deceleration to slowest growth since 2016

U.S. Purchasing Managers' Index, 2008-2018

Manufacturing, diffusion index, base = 50

Monthly and 12-month moving average



Source: Institute for Supply Management, *Manufacturing Report on Business*

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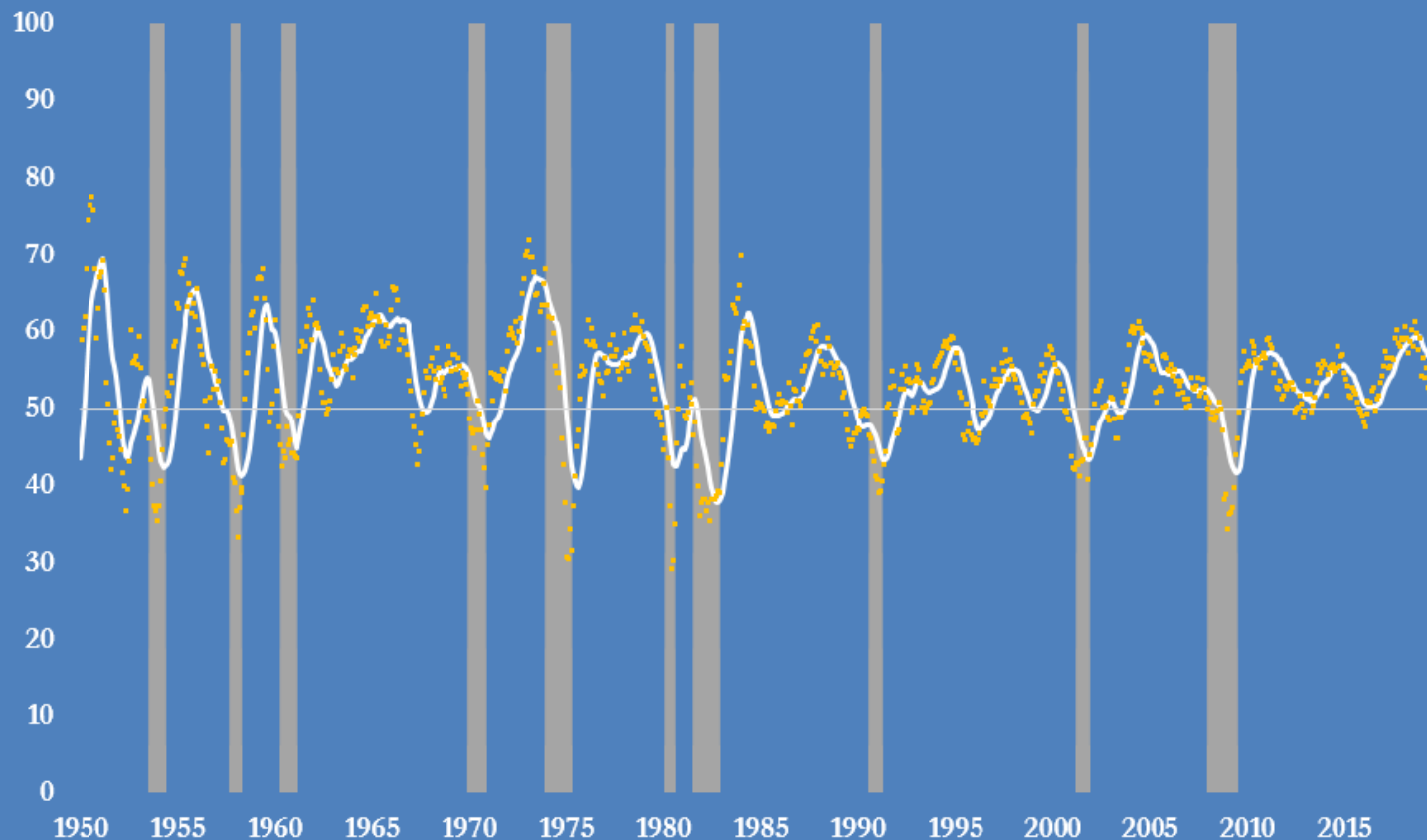
U.S. manufacturing loses momentum

Mid-cycle slowdown or end-of-cycle recession? Signs are still ambiguous

U.S. Purchasing Managers' Index, 1950-2019

Manufacturing, diffusion index, base = 50

Monthly and 12-month moving average

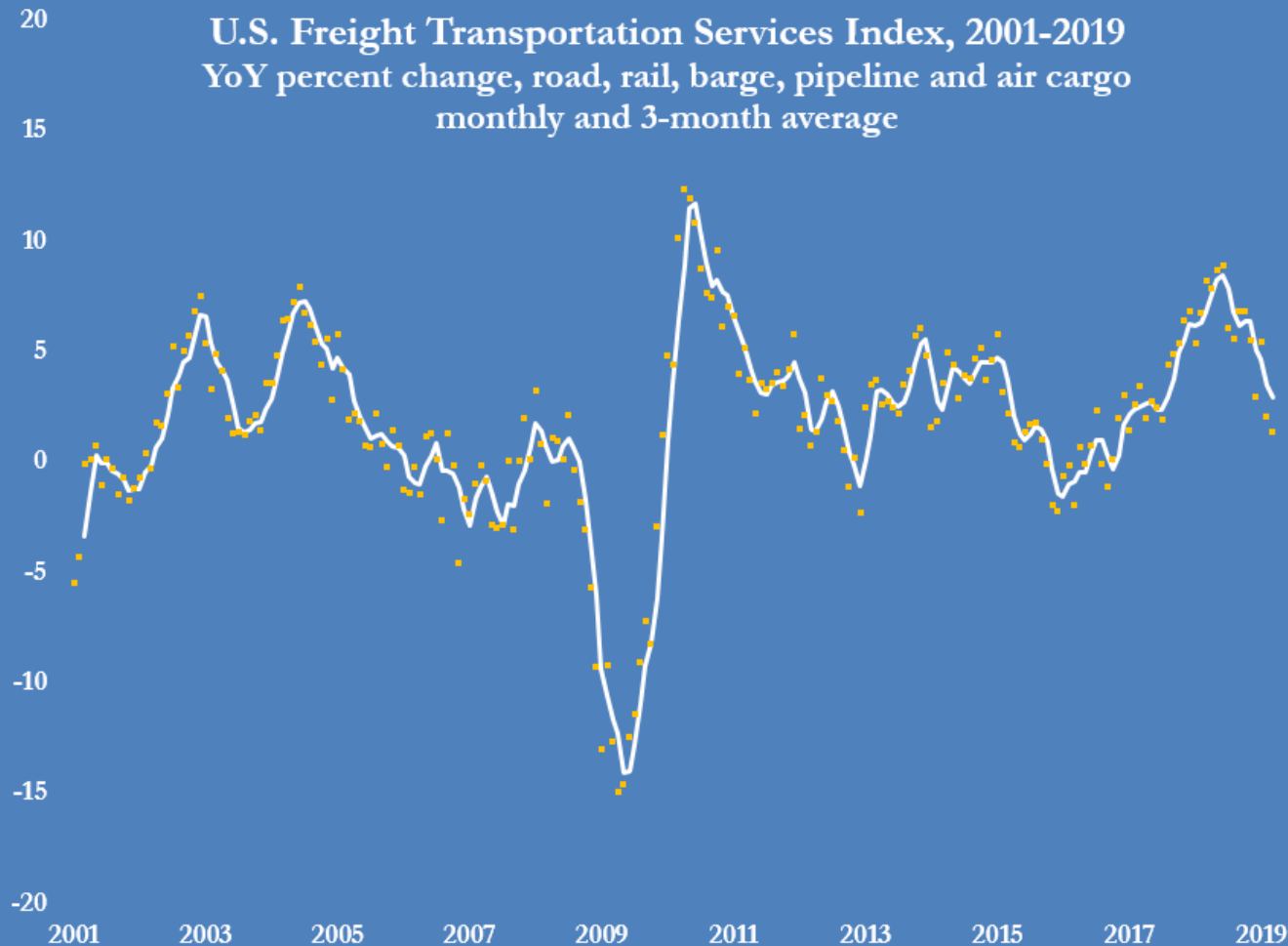


Source: Institute for Supply Management, *Manufacturing Report on Business*

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U.S. freight volume growth has decelerated since summer of 2018

Freight volumes growing around +3% down from +8% in middle of last year



Source: U.S. Bureau of Transportation Statistics

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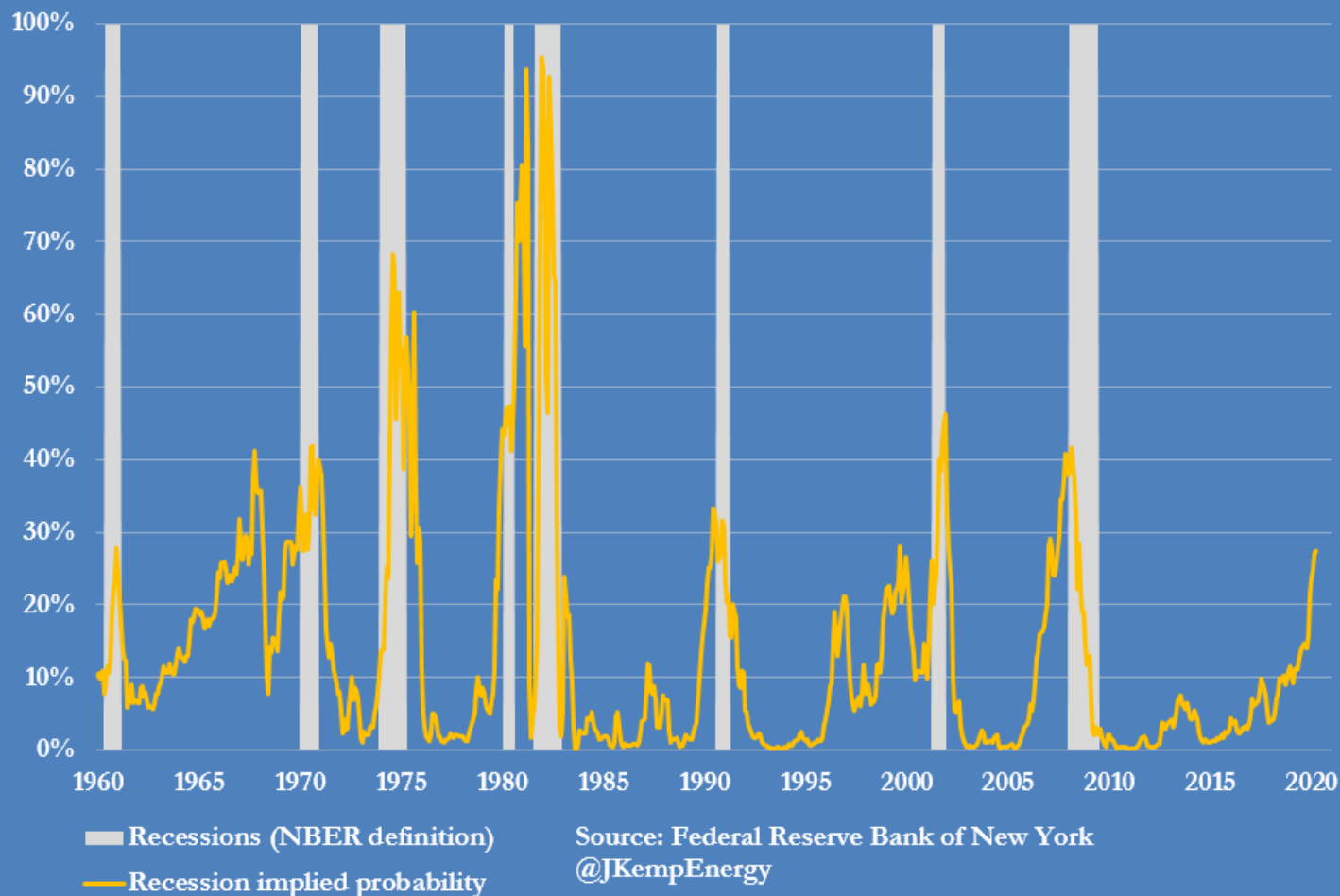
U.S. Treasury yield curve inversion signals heightened recession risk

FRBNY yield curve model shows 30%+ probability of recession in May 2020

Probability of U.S. recession 12-months ahead, 1960-2020

Based on Federal Reserve Bank of New York's yield-curve model

Using spread between 3-month Treasury bills and 10-year Treasury Notes



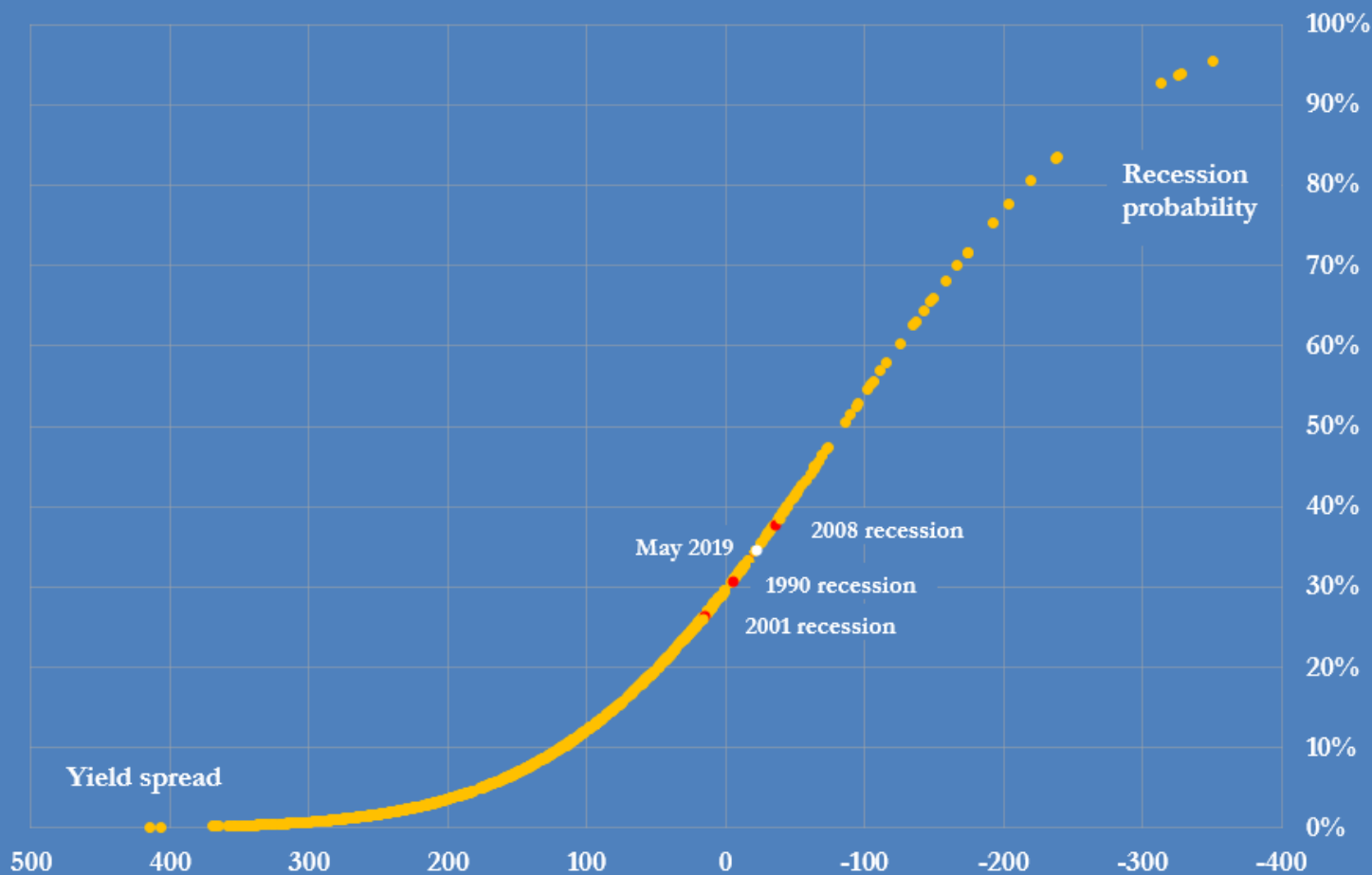
FRBNY yield curve model currently puts recession risk around 35%

Recession risk now higher than before 1990 and 2001 downturns

New York Fed yield-curve recession probability model

Implied probability of recession 12 months ahead

Using spread between 3-month Treasury bills and 10-year Treasury notes



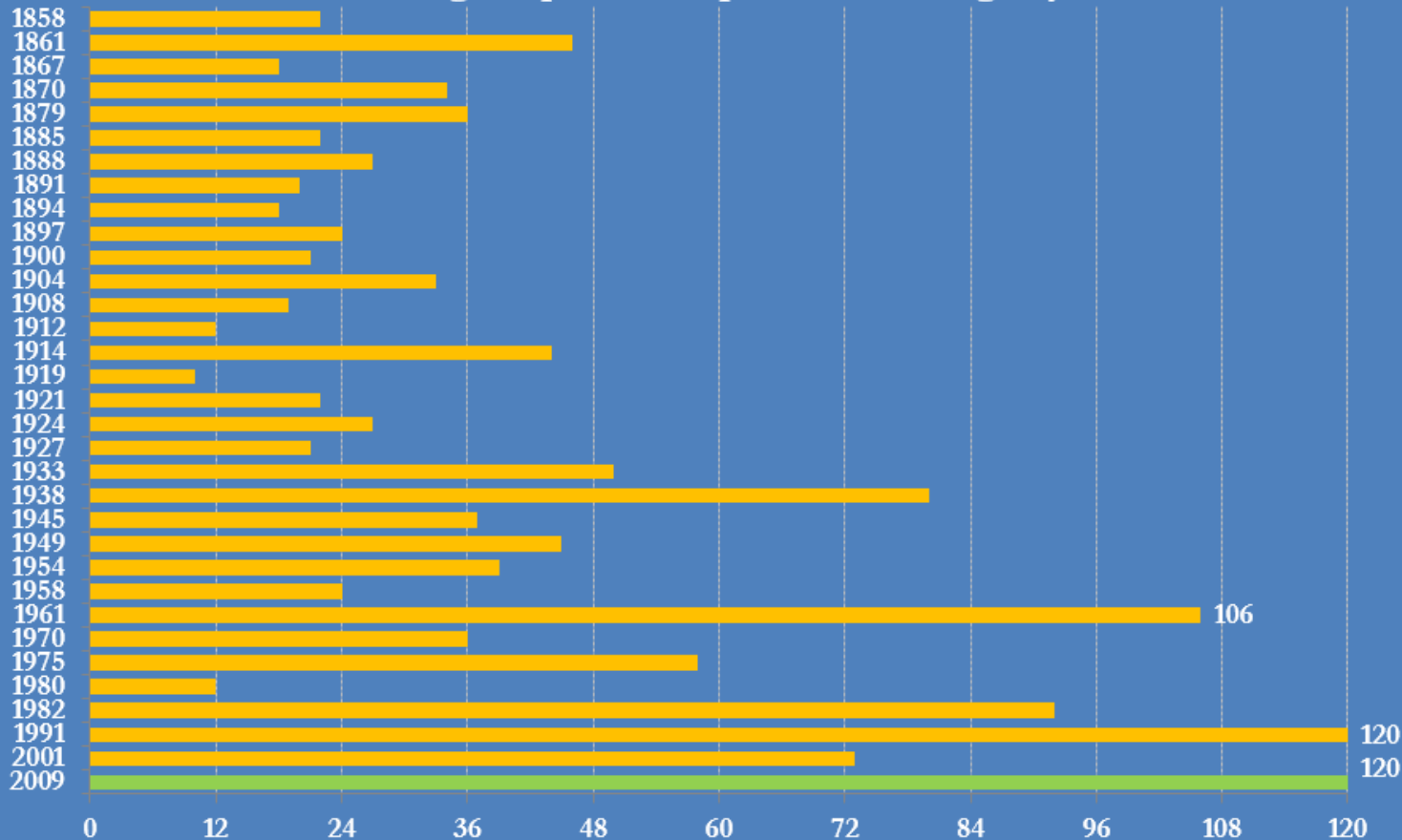
Source: Federal Reserve Bank of New York

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U.S. business cycle very mature

Do expansions die of old age or are they murdered? Risks of policy error?

Duration of U.S. business cycles (expansion phase) since 1858
months from trough to peak for expansions starting in years shown



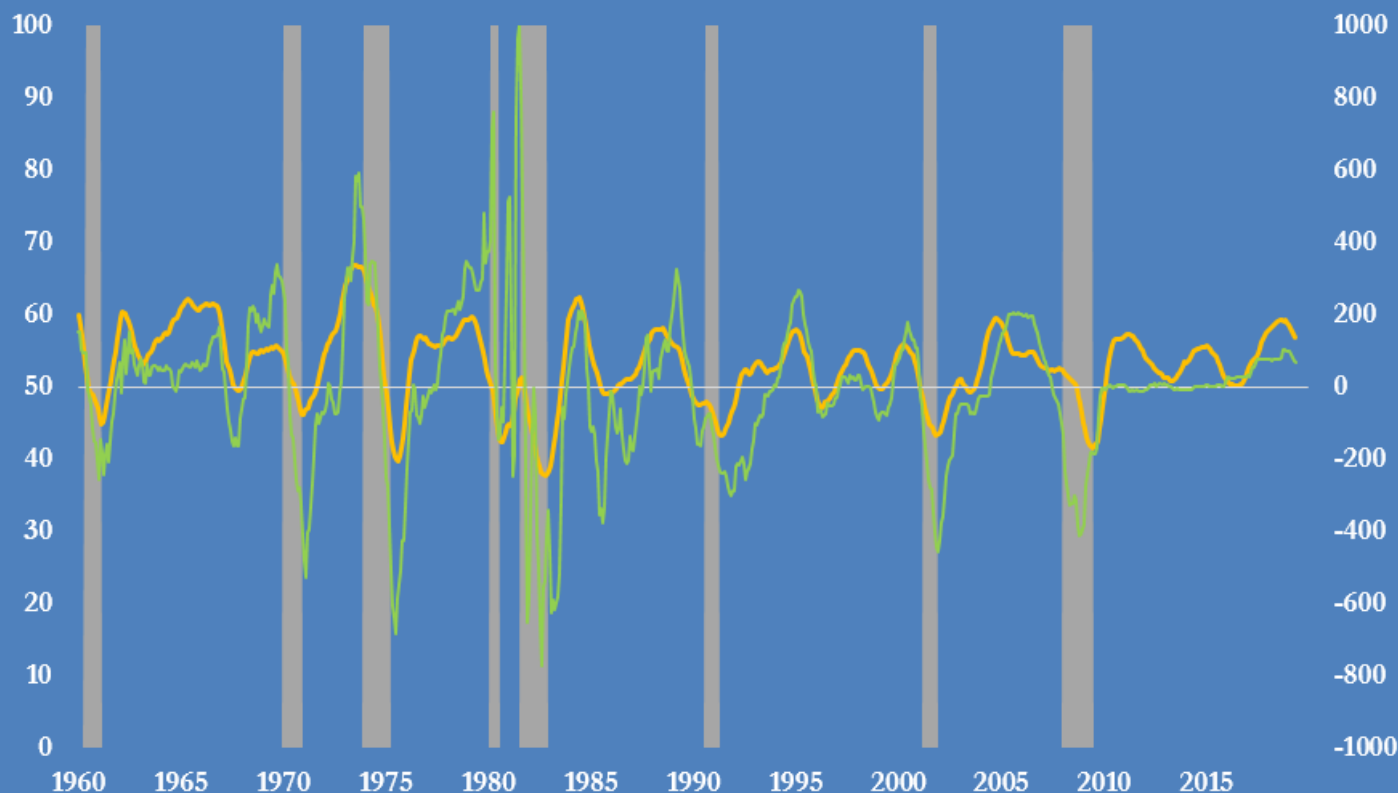
U.S. Federal Reserve typically responds to signs of slowing economy

If manufacturing growth decelerates further, Fed likely to ease monetary policy

U.S manufacturing activity and short-term interest rates

ISM composite index (12-month average)

Effective fed funds rate (basis points, change from year earlier)



■ NBER recessions

— ISM manufacturing index (left axis)

— Effective federal funds rate (right-axis)

Sources: Institute for Supply Management, Federal Reserve, NBER, Refinitiv, @JKempEnergy

U.S. interest rate traders expect almost three quarter point cuts by end 2019

Insurance policy against deeper and more prolonged slowdown

Expected federal funds rate in Jan 2020
Percent, implied by futures prices



Source: CME Group

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Scenarios for the global economy in 2019

U.S./China relations, business reaction, Fed response dominate outlook

U.S./China relations

- (1) Comprehensive settlement
- (2) Limited trade deal
- (3) No deal

Fed policy response

- (1) Extended pause
- (2) Easing
- (3) Renewed tightening



Global economic outlook

- (A) Re-acceleration
- (B) Extended slowdown
- (C) Recession

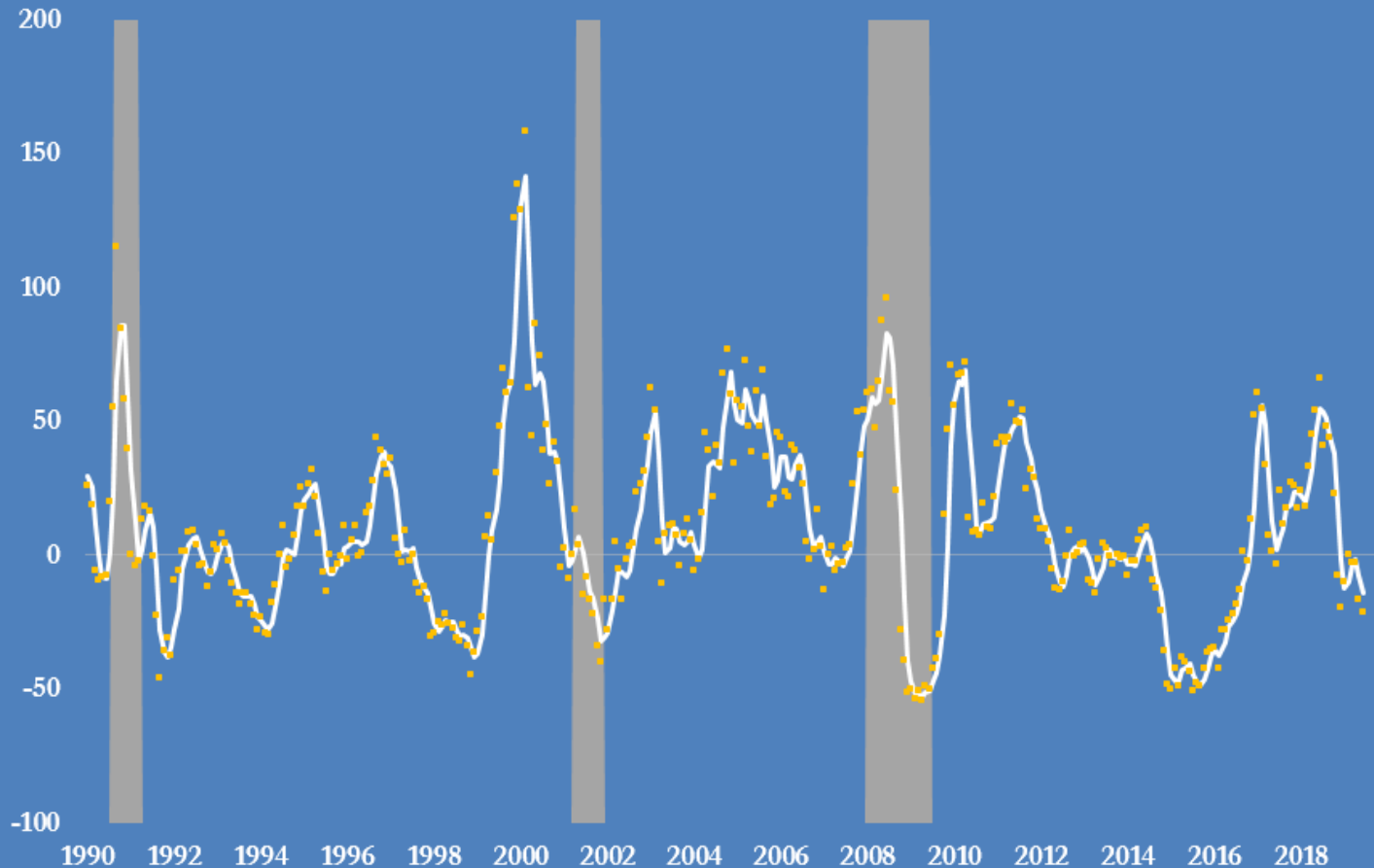
Mid-cycle slowdown or end of cycle?

Is the global economic cycle in 1998 or 2001?

Brent prices and the economic cycle – 1998 or 2001?

Intra-cycle and end-cycle slowdowns have different consequences for oil market

Brent spot price, 1990-2019
Percent change from year earlier, monthly and 3-month average
NBER U.S. recession dates shown



Source: ICE Futures Europe, National Bureau of Economic Research

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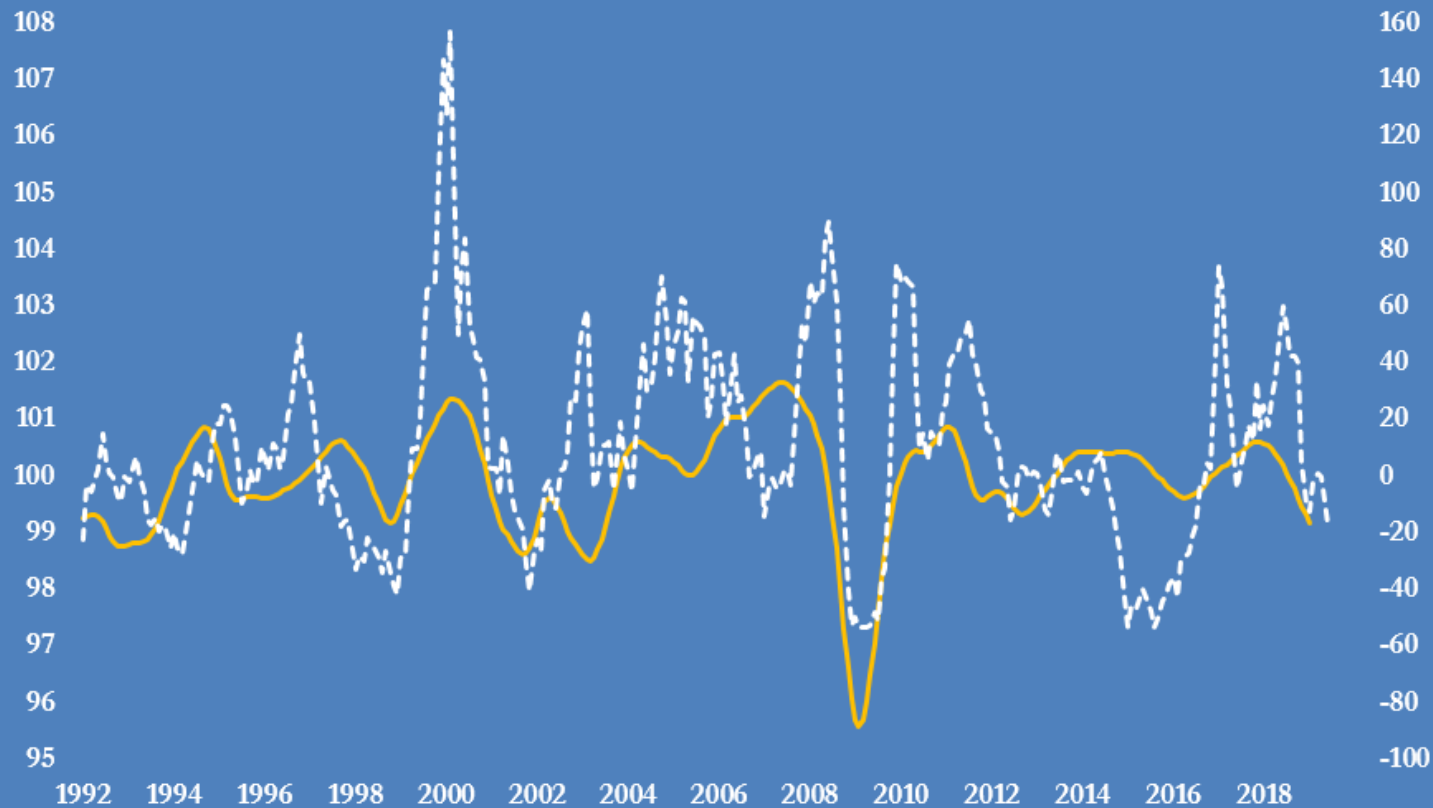
Brent spot price and the global economic cycle

Spot price have slumped as economic and consumption outlook worsens

OECD composite leading indicator versus Brent price

Leading indicator long-term trend = 100

Brent front-month futures price, 12-month percent change, U.S\$/bbl



— OECD Composite Leading Indicator (left-axis)

- - - Brent price (front-month futures) (right-axis)

Sources: OECD, ICE Futures Europe
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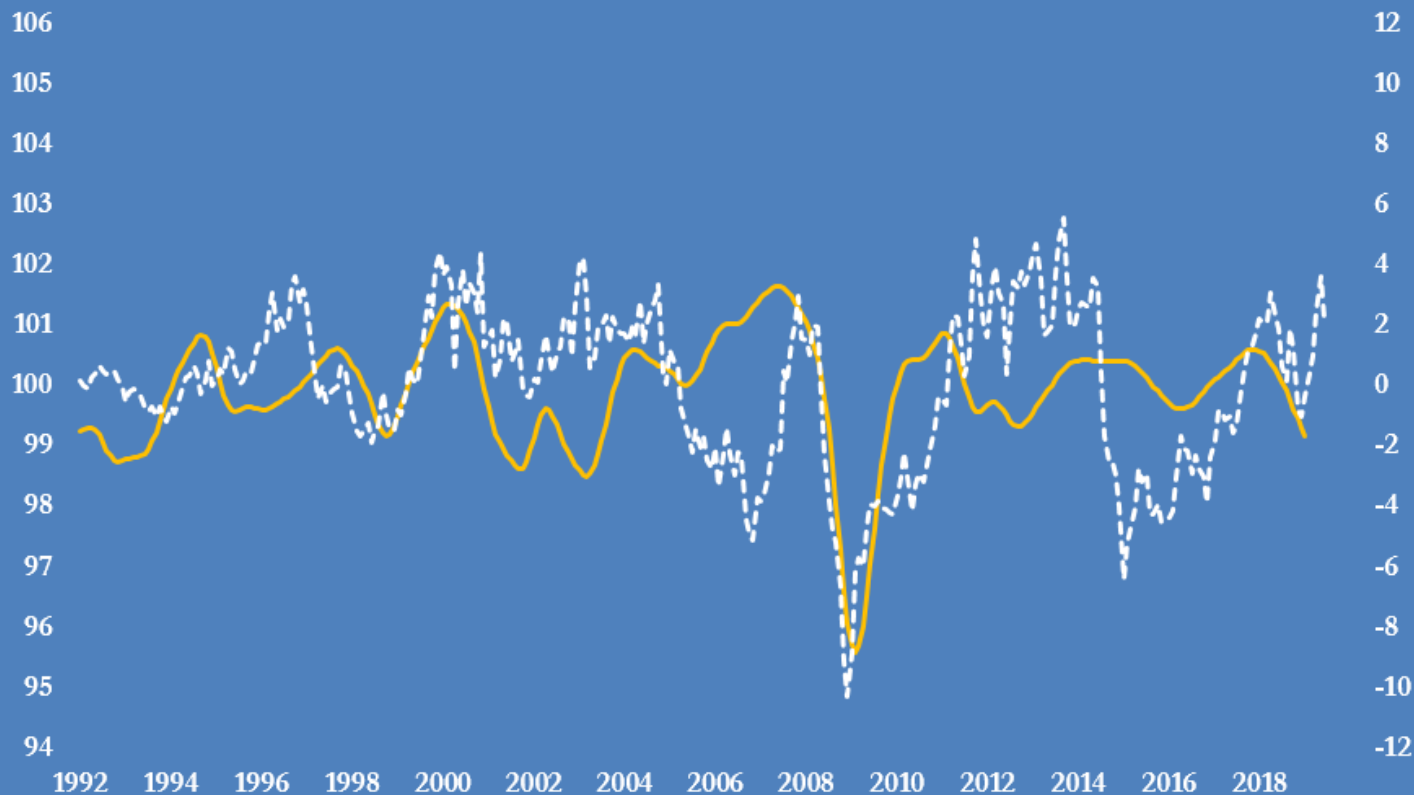
Brent calendar spread and the global economic cycle

Spreads have remained strong as a result of (temporary?) supply disruptions

OECD composite leading indicator versus Brent calendar spread

Leading indicator long-term trend = 100

Brent spread U.S.\$ per barrel, contango (-) or backwardation (+)



— OECD Composite Leading Indicator (left-axis)
--- Brent calendar spread (M1-M7) (right-axis)

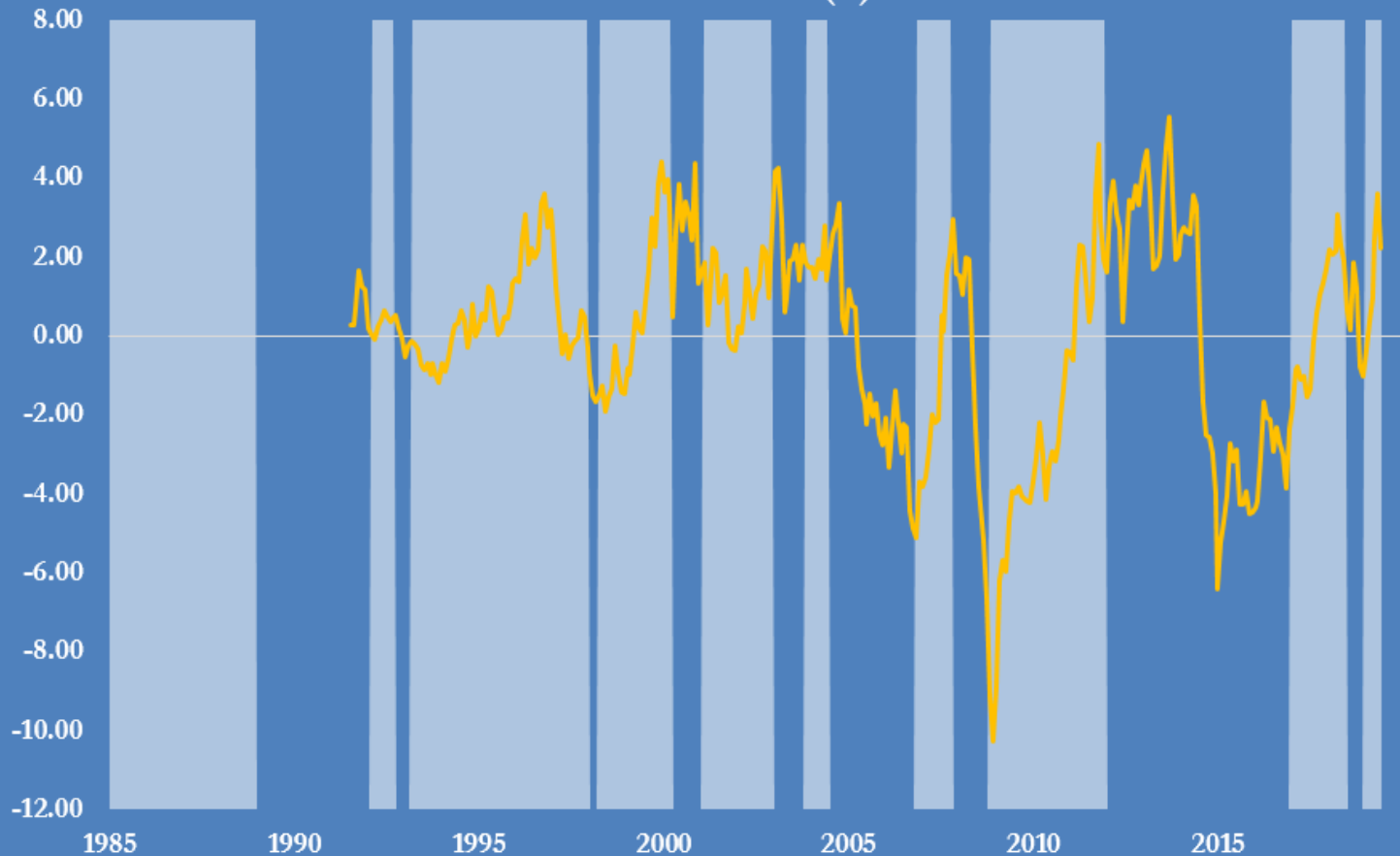
Sources: OECD, ICE Futures Europe
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Saudi Arabia has resumed traditional role as swing producer

Kingdom can always force oil market into backwardation if it cuts deeply enough

Saudi Arabia output restraint and Brent spread, 1985-2019

Calendar spread from month 1 to month 7, U.S.\$ per barrel, contango (-)
or backwardation (+)



■ Saudi Arabia output restraint (from OPEC Statistical Bulletin)

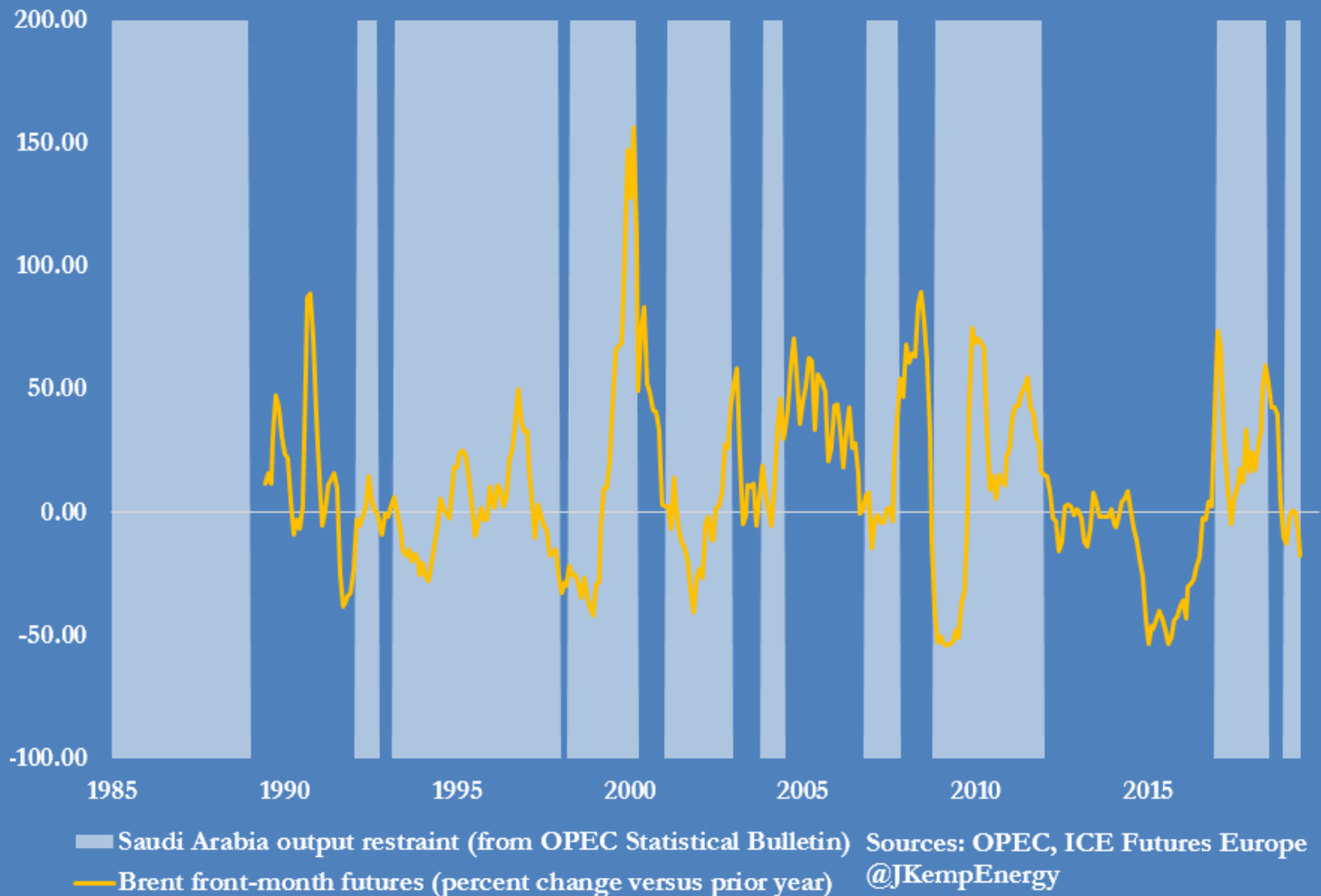
— Brent calendar spread (U.S.\$ per bbl M1-M7)

Sources: OPEC, ICE Futures Europe
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Saudi Arabia is sacrificing market share to protect prices and revenues

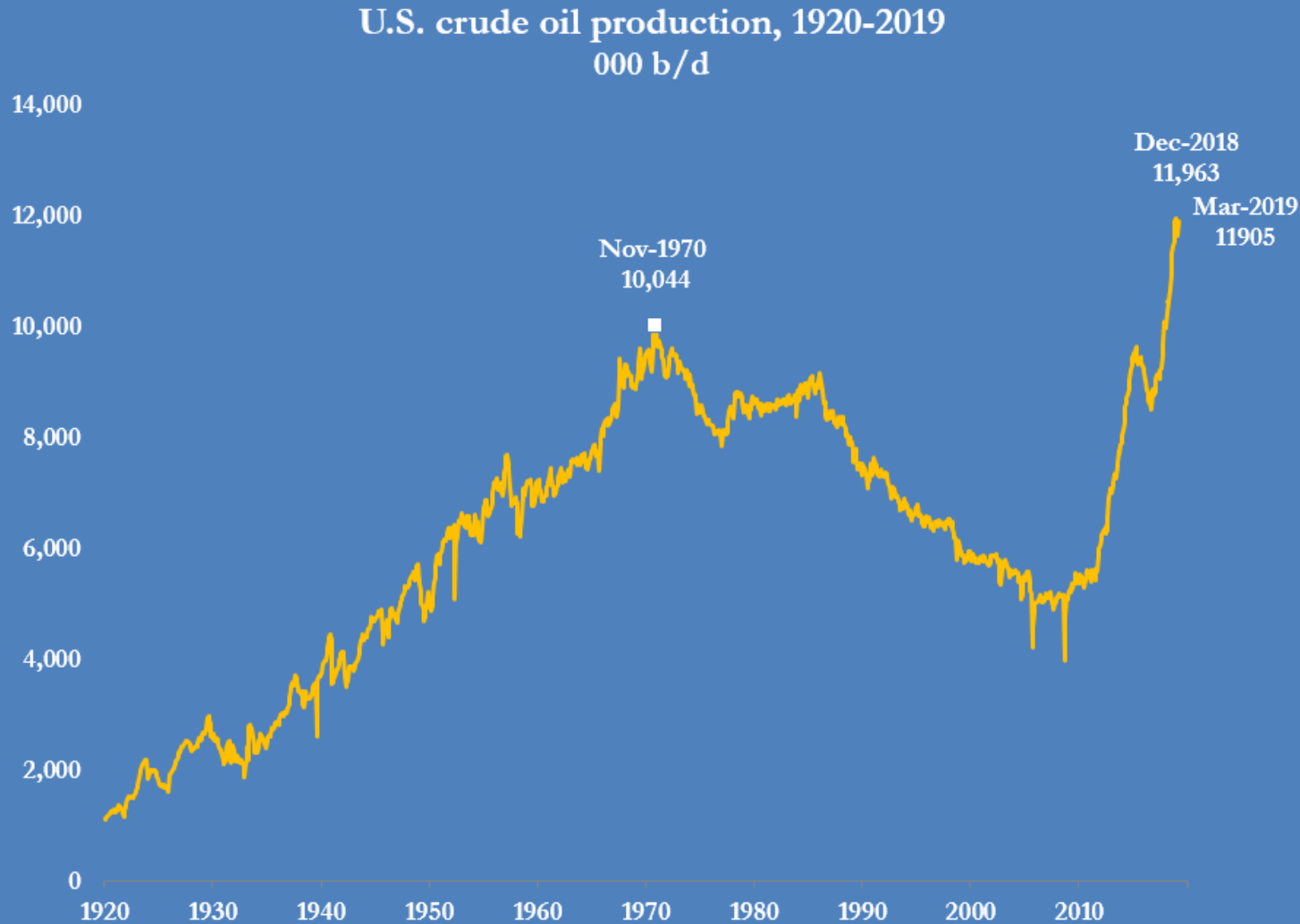
Policy alternates between price-defence and volume-defence

Saudi Arabia output restraint and Brent prices, 1985-2019
Front-month futures price, percent change compared with prior year



U.S. crude production has surged in response to price rise since 2016

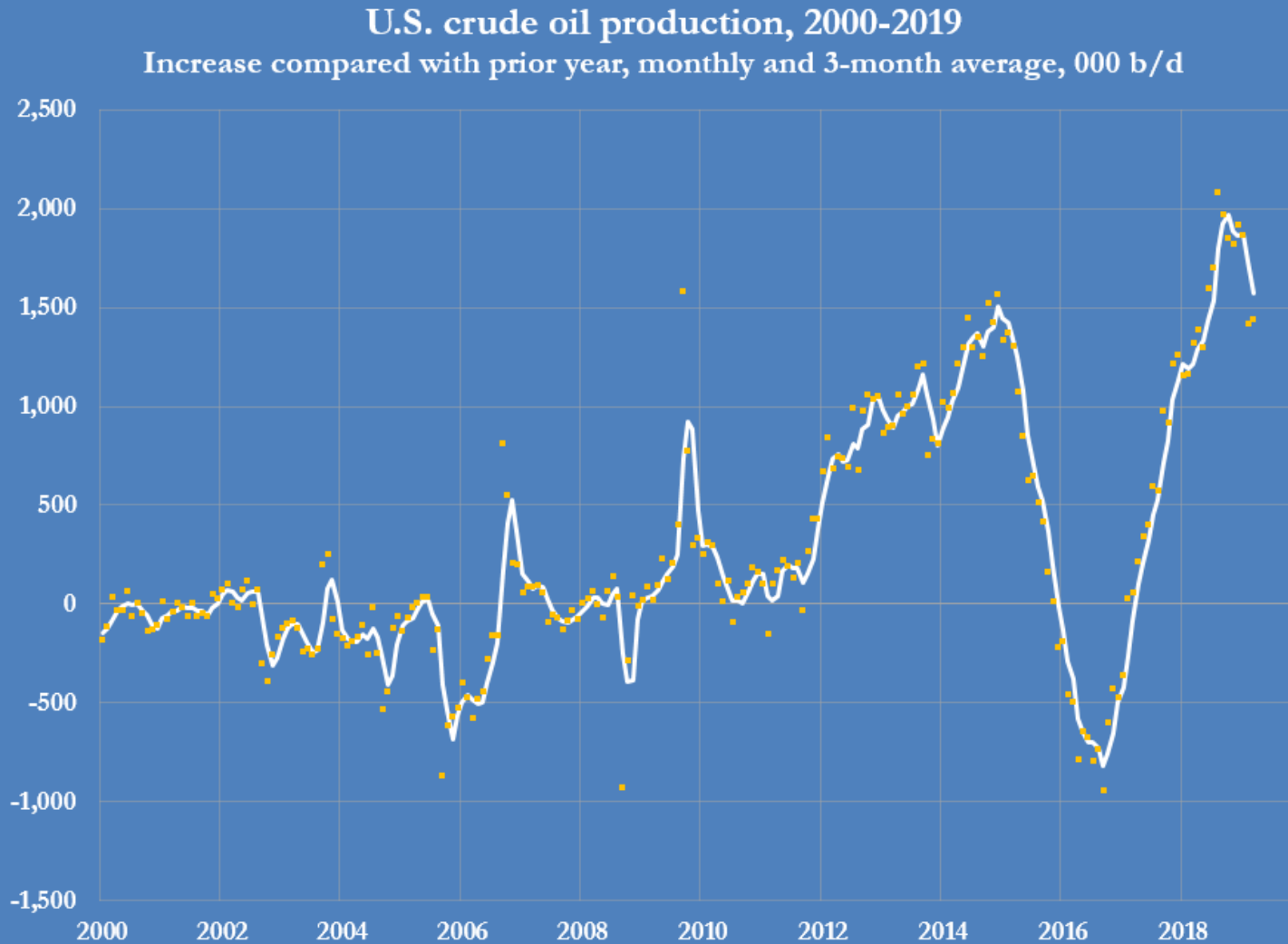
Shale producers have increased output at fastest rate anywhere in history



Source: U.S. Energy Information Administration

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U.S. crude output increased by +1.4 million b/d in year to Mar 2019
Shale boom now decelerating with growth down from +2.0 million b/d in Aug



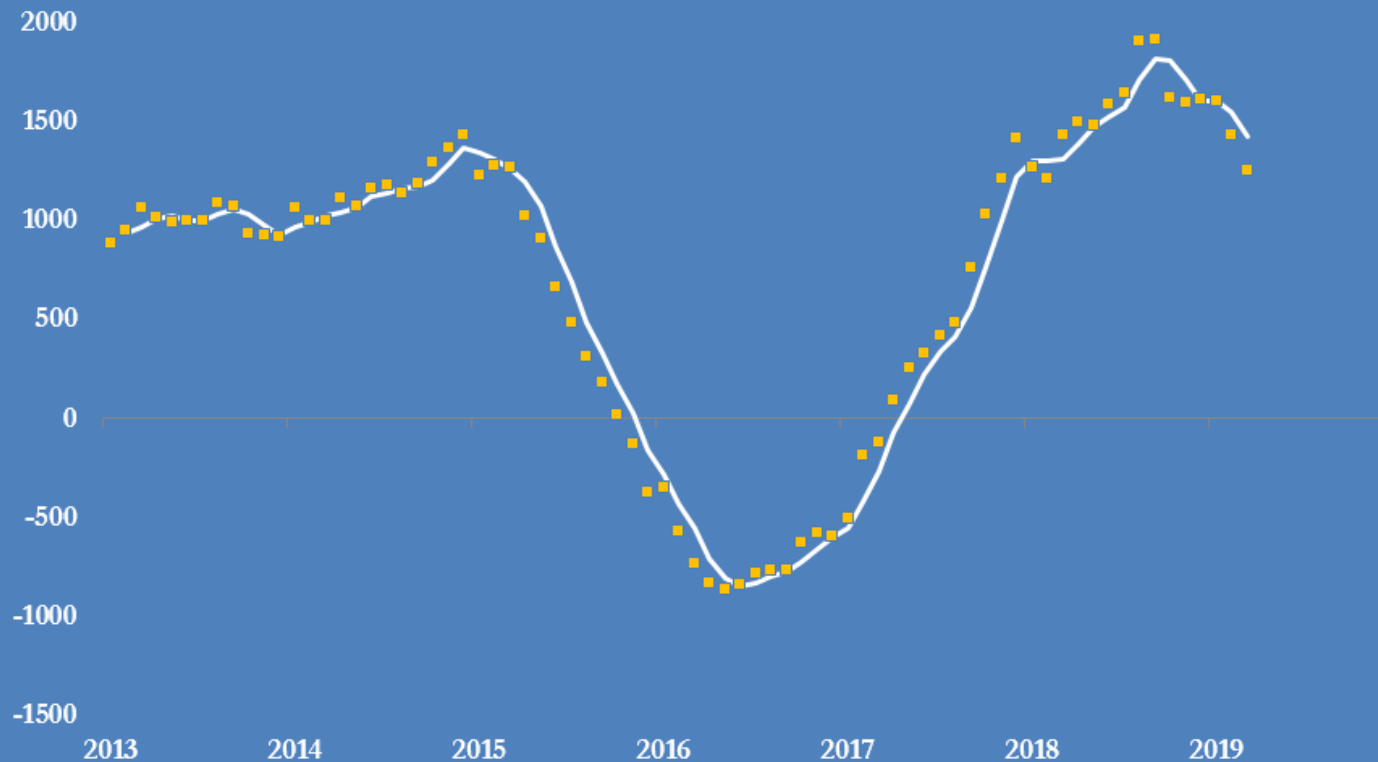
Source: U.S. Energy Information Administration

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U.S. L48 onshore output increased by +1.25 million b/d in Mar

Growth slowing from peak of +1.9 million b/d in Aug-Sep 2018

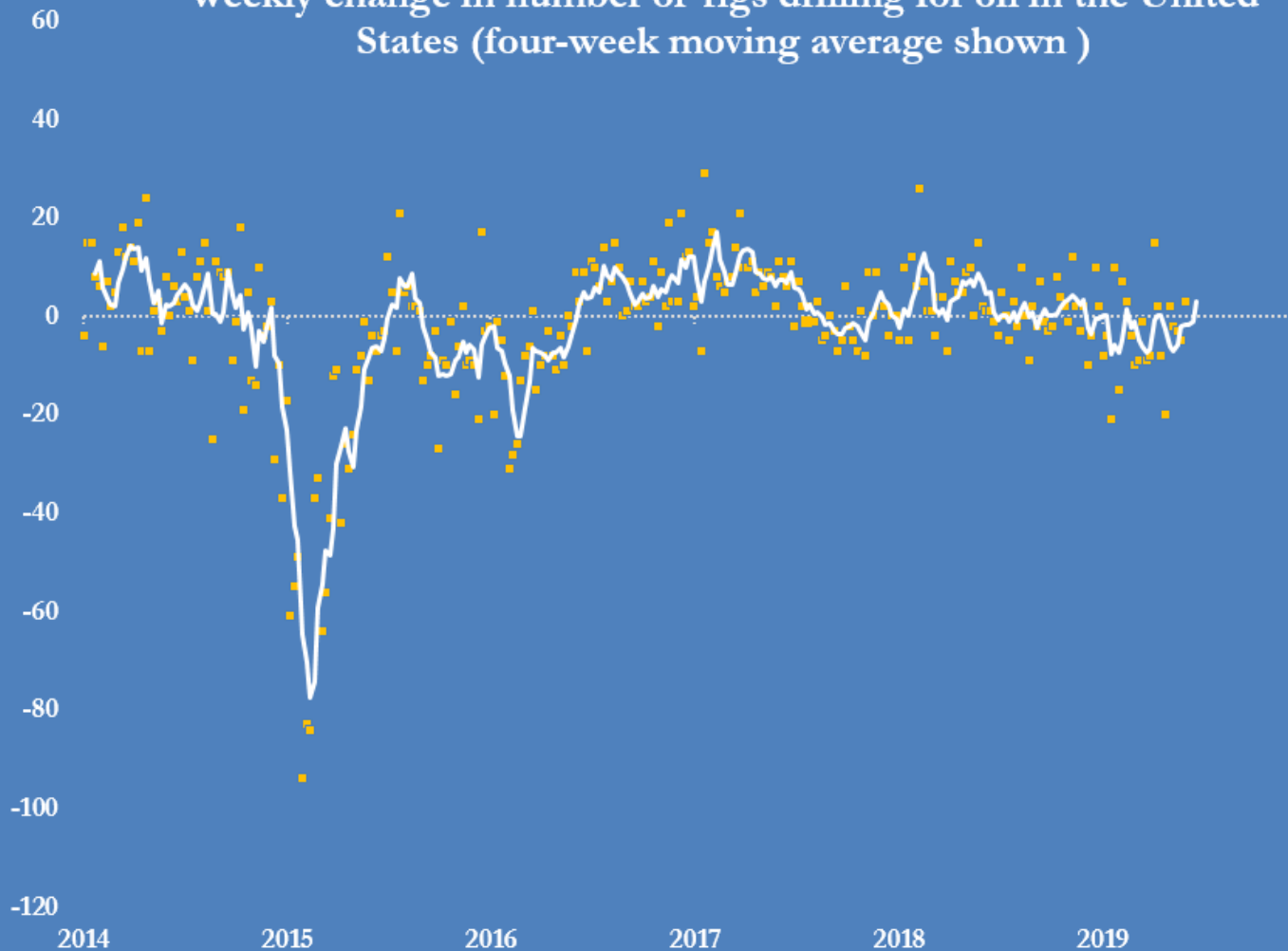
U.S. crude oil production, 2013-2019
Lower 48 states excluding federal Gulf of Mexico, 000 b/d
Increase compared with prior year, monthly and 3-month average



U.S. shale producers have been cutting rig count since end of 2018

Rig count typically follows changes in WTI with lag of 16-20 weeks

Weekly change in number of rigs drilling for oil in the United States (four-week moving average shown)



White House has revealed preference for prices below \$75 or even \$70

Presidential interventions via twitter as focus turns to re-election campaign

Brent crude front month futures price, U.S.\$ per barrel
Presidential tweets and television interviews about OPEC shown



Conclusions

Key sources of uncertainty

Oil outlook will be dominated by developments in the global economy

- ❖ U.S./China relations, business confidence, trade growth
- ❖ Fed reaction function
- ❖ Intra-cycle slowdown or end of cycle?
- ❖ Final boom?

White House must choose between aggressive sanctions policy and low oil prices

- ❖ Squeezing Iran and Venezuela
- ❖ Political impact of rising prices
- ❖ Gearing up for 2020 campaign
- ❖ NOPEC legislation and tweets
- ❖ Leverage over Saudi Arabia?

Saudi Arabia must choose between raising prices and protecting market share

- ❖ Kingdom's price target: \$75? \$80? \$85? \$90?
- ❖ Replacing sanctioned barrels from Iran and Venezuela
- ❖ Spare capacity and production ceiling
- ❖ Future investment
- ❖ Revenue needs and social transformation
- ❖ Aramco privatisation?