# Forecasting US recessions - what works and what doesn't

Chris Watling | Longview Economics | 05 October 2016

## EXECUTIVE SUMMARY

Broad analysis of generally effective indicators of recessions leads to the conclusion that recession risks in the US are clearly continuing to rise. A wide range of indicators confirm that message. The state of health of the corporate sector, for example, continues to deteriorate, corporate credit conditions are tightening and key leading indicators are in recession territory, while there has been a monetary tightening potentially sufficient to cause a recession.

Some doubts, however, remain. Certain indicators are behaving in an unusual and inconsistent manner compared to their behaviour in prior recession build–ups. US high yield corporate bond spreads have eased dramatically in recent months, the US yield curve hasn't inverted (although maybe it can't in a ZIRP environment) while the fall in the oil price has somewhat supported the US economy (albeit not to the extent expected prior to the fall.

Three charts square the circle.

## KEY MACRO INDICATORS & FORECASTING RECESSION RISKS

US cyclical equity bear markets are driven by a combination of three factors: anticipating US recessions – and with that a downturn in earnings; tight/tightening monetary policy; and/or, shocks (somewhat, but not entirely, unforecastable).

In our February 2006 report examining these issues (:Why Stock Markets Go Down"), we drew the following conclusions:

- "93% of the 28 corrections in the S&P500 over the last 77 years (i.e. up to 2006) were caused by some combination of the following three factors:  an economic recession; rising cost of capital; and/or, a shock.

- 50% of the corrections were triggered by an economic recession.

- A further 25% are primarily due to shocks (e.g. onset of WWII, Korean War, and removal of price controls in 1946).

- There has only been one US recession in the last 77 years which has not caused a correction in the equity market (i.e. in 1945).

- A rising cost of capital has been a key contributory factor to almost two thirds of the 28 corrections since 1928.

- A significant rise in the cost of capital has a 93% chance of triggering a correction.

- Valuation alone is rarely, if ever, the cause of a correction in equity markets.

\* A correction was defined as a 10% or greater move in the S&P500 from its local closing high to local closing low.

**Figure 1:  US GDP growth (ex-consumption, Y-o-Y %)**
Excluding consumption (albeit a large part of GDP demand), US GDP growth is now negative. In every other instance post WWII, when it's been this negative, the US economy has been in recession.
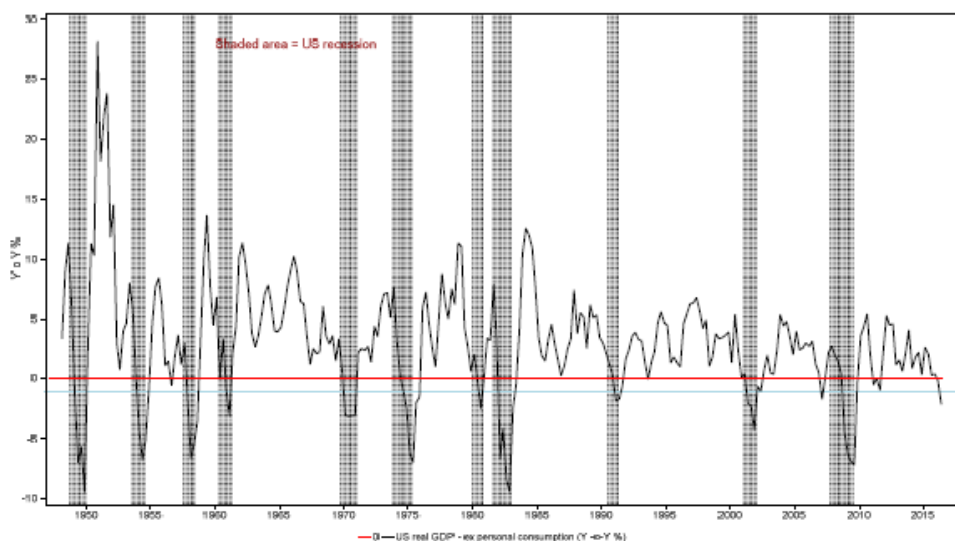


Sources:  Longview Economics, Macrobond.

Earlier this year, during the stock market sell-off, there was much discussion of growing US recession risks. Indeed, in our November 2015 report (Global Macro Report, 6 November 2015: "Rising US Recession Risks"), we highlighted our concerns in that respect.

The Fed, however, is working its way towards one or more further rate rises. Only this past month, various Fed Governors have discussed the strength of the economy and the need for further hikes (see for example, comments by Rosengren that "a reasonable case can be made

for continuing to pursue a gradual normalisation of monetary policy" on 9 September 2016), albeit there have been some dissenters (e.g. Lael Brainard). All of the comments pushing for hikes seem somewhat at odds with a rising recession risk.

In this Longview Letter, we re-analyse and quantify the efficacy of the key macro indicators which we use to forecast recession risks. In particular, we break the key recession indicators into six key categories:

   i.     the state of health of the corporate sector;

   ii.    the tightness of credit conditions (corporate & household);

   iii.   the tightness of monetary policy

   iv.    the state of financial conditions;

   v.     the message of leading economic indicators; and,

   vi.    wealth effect and other indicators (including consumption indicators).

While there are other recession indicators, these are the ones that we find to be, on the whole, the most effective.

**In summary, the case for a US recession continues to build, albeit some ambiguity remains over certain parts of the recession set-up.**

## 1. The health of the corporate sector has deteriorated over recent quarters

In particular, after deducting share buybacks, the corporate sector is running a high cash flow deficit (i.e. over 4% GDP). That has historically been an effective recession warning (Figure 2).

**Figure 2:  US Cashflow earnings less uses (% of GDP) with share buybacks included**

Including share buybacks in the corporate financing gap calculation enhances the contrast between the pre- and post-Bretton Woods eras. Pre 1971, the gap didn't move above 2% of GDP. In the 1970s, it typically reached around 3% of GDP. Since the early 1980s, the gap has often been 4% or higher. That has tended to occur close to the start of recessions (1984 is the exception).
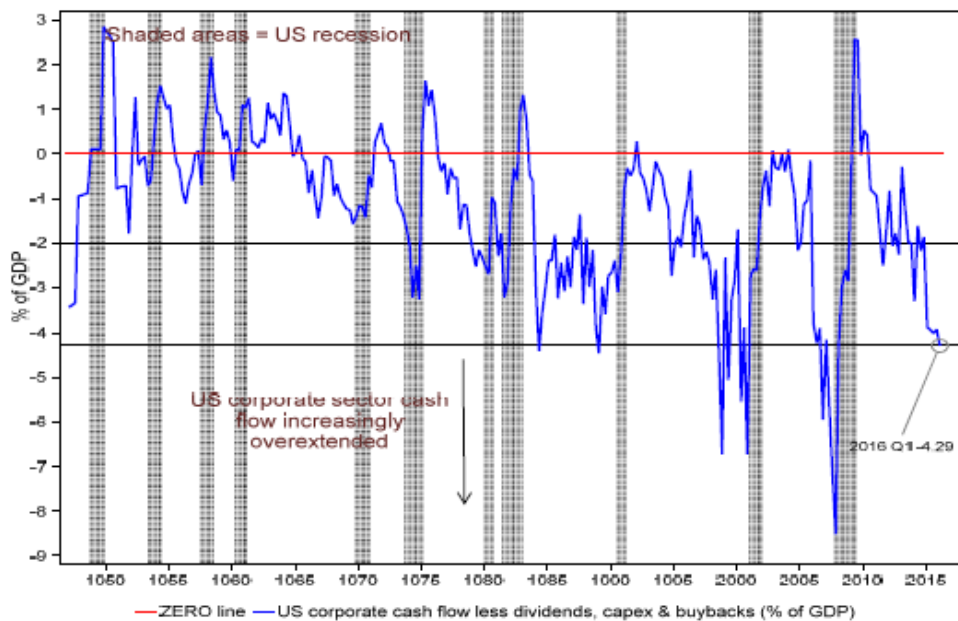


Sources:  Longview Economics, Macrobond.

Added to that, profitability is contracting, margins are being squeezed (both reasonably efficacious recession signals) while productivity is also running at a pace consistent with recessionary conditions (Figure 3). On these indicators alone, the case for a recession is strong – either immediately or within a small handful of quarters.

**Figure 3:  US labour productivity (Y-o-Y %, six quarters smoothed)**
Historically US productivity growth slowing (on a smoothed basis) to
below 1% growth is typically a signal that the US is in recession or about
to enter recession. Prior to 1980, that was always correct. Since 1980,
there have been some false signals. Since 2012, productivity has
remained almost consistently below those levels.
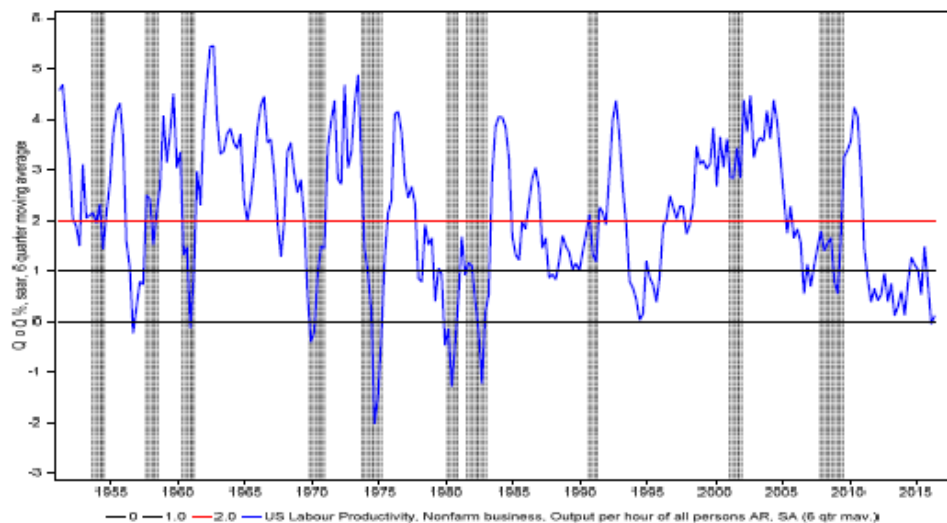


Sources:  Longview Economics, Macrobond.

The only real question mark with respect to these indicators is the **pure** corporate financing
gap – that is, does that need to be at a deficit of 1% or more (or even 2% or higher – see
Figure 4) in order to complete the full house of corporate sector recession signals? In a world
of limited productivity growth and limited/no business investment growth, we suspect it
doesn't (there are, of course, no prior comparable examples to use as a precedent in order
to confirm that suspicion).

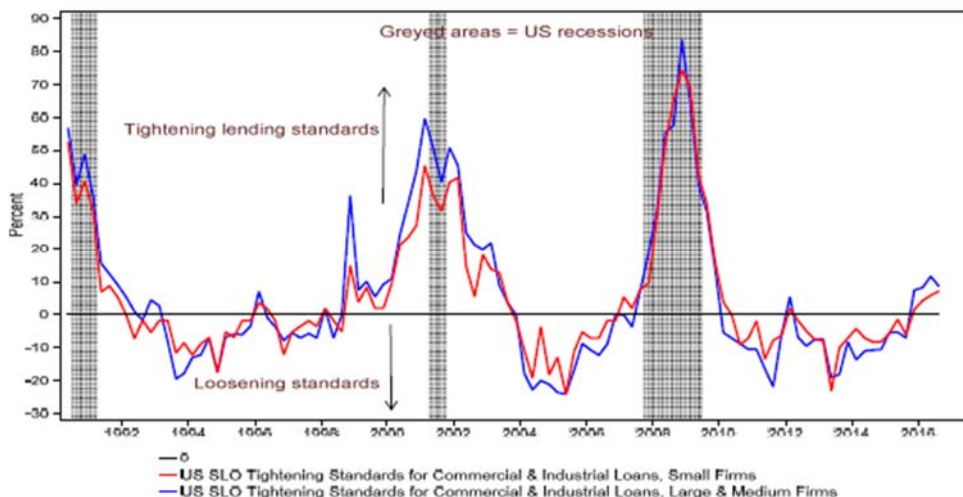Figure 4: US recession indicators – corporate sector indicators

| # | Indicator | Signal rule | Current recession warning signal (Y/N) | Historical time from signal to recession (range) | Efficacy | Comment |
|---|-----------|-------------|------------------------------------------|-----------------------------------------------------|----------|---------|
| 1 | Corporate financing gap – CFG (as % of GDP) | **Move below 1% deficit** = soft warning; | **No** (although indicator moved briefly below 1% in q2 2015) | For soft warning it's between 2 and 16 quarters until recession (most examples are 2 to 7 qtrs) | Average w.r.t. timing | All recessions have started when the corporate sector has been overstretched |
| 1a | CFG – version 2 | **Move below 2%deficit** = hard warning | **No** – currently at 0.5% deficit | Signals occur between 0 and 11 quarters ahead of recession – most examples between 0 and 2 quarters. | Not all recessions are preceded by move over 2% deficit – all moves over 2% = recession | CFG only reaches 2% of GDP in 7 of the 10 recessions since 1950. |
| 1b | CFG with Buybacks | **Move below 4% deficit** = recession warning | **Yes** – @ 4.3% deficit | Between 5 and 8 quarters ahead | High (although 1 false signal in 1984) | Has signalled. Needs to be watched closely |
| 2 | NIPA corporate profits | **Move below zero line** | **Yes** – since q4 2015 | Between zero and 12 quarters | **8 out of 11 signals correct** | Good indicator. Sometimes too early though |
| 2a | Margins Model: Nominal GDP less Unit Labour Costs (both Y-o-Y %) | **Sharp deceleration** of growth (i.e. margin squeeze/rise in ULC) | **Yes** – in recent quarters | A handful of quarters | Does have false signals | Interesting. Surprising given current weakness US is not already in recession |

## 2. Corporate credit conditions have clearly started to tighten

This is evident from responses to the senior loan officers' survey "tightening lending standards" question. For both "large & medium" and "small" firms, this indicator has moved above zero (Figure 5). Recessions typically follow within a few quarters. The second key corporate credit conditions question (regarding loan spreads over the cost of funding) is yet to signal recession although it is close. Household credit conditions often don't generate signals ahead of recessions and are therefore not a good indicator. In the round, therefore, these indicators are consistent with a rising recession risk. However, the history for these indicators is limited (Figure 6).

**Figure 5:  US SLO Corporate Credit Conditions – tightening lending standards**



Sources:  Longview Economics, Macrobond.

#### Figure 6: US recession indicators – Credit condition indicators

| No. | Indicator | Signal rule | Current recession warning signal (Y/N) | Historical time from signal to recession (range) | Efficacy | Comment |
|---|---|---|---|---|---|---|
| 3 | Corporate credit conditions (tightening lending standards) | **Move above ZERO** | Yes – in q4 2015 | Between 2 and 10 quarters (only 2 historical examples) | Effective – and in one example, timely (early in the other) | Credit conditions are tightening which is key |
| 3a | Corporate credit conditions (loan spreads) | **Move above ZERO** | No – although close | Between 0 and 9 quarters | Yes – although limited examples | Close to signalling |
| 3b | Household credit conditions | **No clear signal rule** | Not relevant | | Weak indicator | Not all recessions have a tightening of household credit conditions. Limited data |

Source: Longview Economics.

### 3. Monetary policy

The shadow Fed Funds Rate has undergone a full/typical tightening cycle. The real, inflation-adjusted, shadow Fed Funds has tightened by 326bps and the nominal shadow Fed Funds Rate has tightened by 348bps. Relative to recent tightening phases, that is sufficient (at the short end). With that, the yield curve has flattened indicating slowing growth (and potentially recessionary conditions).

**Whether or not, though, the curve should invert is a key debate.** Ahead of all prior recessions (post 1970), the US yield curve has inverted (i.e. 10 year less than 2 year yield). With ZIRP (or close to ZIRP), it;s not clear whether the yield curve can invert. If the Japanese example post–1990 (and its move to ZIRP) is a precedent, then a yield curve inversion is not a necessary condition for a recession. Added to that, there are some other signs that money is becoming

tight. US auto sales, for example, have peaked and plateaued (end 2015/start of 2016). That is typical, although not conclusive, behaviour ahead of recessions. It also often indicates tighter monetary conditions. Currently, those tighter conditions are evidenced by tighter credit conditions for auto loans in the SLO survey. Housing data also often slows its acceleration (or reverses) ahead of recessions. Both housing and car sales are interest rate sensitive sectors.

In aggregate, therefore, **the monetary policy indicators are unclear**. Short rates may need to tighten further in order to invert the yield curve. Equally, given near ZIRP conditions in the US, the curve may no longer be able to invert.

**Figure 7:  US Yield curve steepness, Fed Funds rate and Shadow Fed Funds rate**
This chart makes a strong case that the shadow Fed Funds Rate has been a more important measure of monetary tightening than the Fed Funds Rate in recent years, with the yield curve flattening as the shadow rate rose since 2014. Normally, the recession signal is generated by an inversion of the curve during Fed tightening. Whether or not the curve can invert in a near ZIRP environment is a key question.
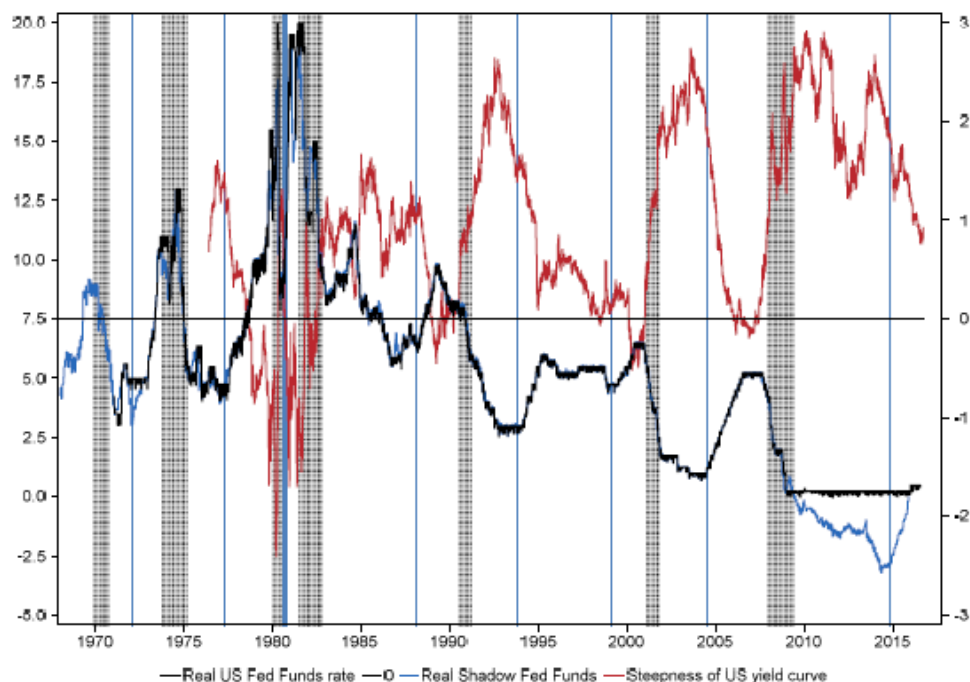


Sources:   Longview Economics, Macrobond.

Figure 8: US recession indicators – Monetary policy indicators

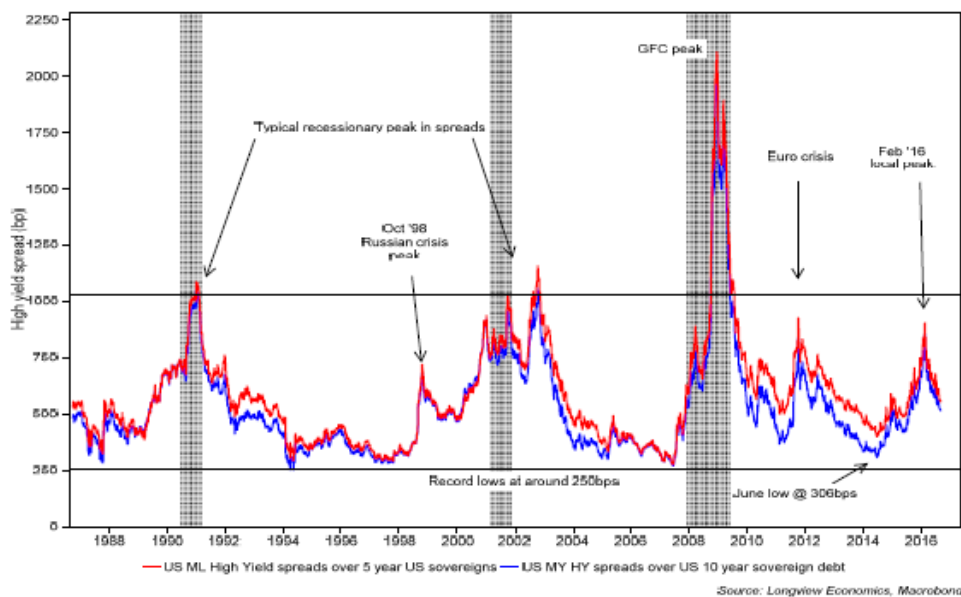| No. | Indicator | Signal rule | Current recession warning signal (Y/N) | Historical time from signal to recession (range) | Efficacy | Comment |
|-----|-----------|-------------|------------------------------------------|---------------------------------------------------|----------|---------|
| 4 | Yield Curve inversion | **10 less 2 year** below zero (stronger efficacy than 10 less 5 year or 30 less 10 year) | **No** – not currently | Between 10 months and 2 yrs ahead of recession | **Strong** | Not clear with ZIRP if curve can invert |
| 5 | Real Fed Funds rate | **Tightening of over 300bps is significant** – although deeply ambiguous | **No** – only 25bps tightening on this metric | Typically a few months from end of tightening. Key though is magnitude of tightening. | Previously strong – now not clear | Probable problem with this indicator is that it doesn't account for QE hence shadow Fed Funds version below |
| 5a | Real Shadow Fed Funds Rate | n/a | Yes (possibly – although not clear rule as no prior examples) – **tightening of 326bps already** | One only example | Not known | If we assume shadow Fed Funds is a valid alternative for Fed Funds, then tightening is significant |

Source: Longview Economics.

## 4. Financial conditions indicators have backed away from recession risk level

This may be temporary and may indeed reflect the move by the ECB into further unconventional territory – i.e. buying European corporate bonds (and creating knock-on effects on US corporate spreads). Taken at face value, US high yield corporate bond spreads have eased dramatically in recent months which is not consistent with rising recession risks (fig 1e). We examined other financial stress/financial conditions indicators. Most offer no further information. The newer NACM indicator is interesting and shows evidence of some tightening in both the manufacturing and services sector (although due to its newness, there are no historical precedents).

**Figure 9:  US High Yield corporate bond spreads shown with US recessions**
On this measure, financial conditions have eased dramatically since February this year.



Sources:   Longview Economics, Macrobond.

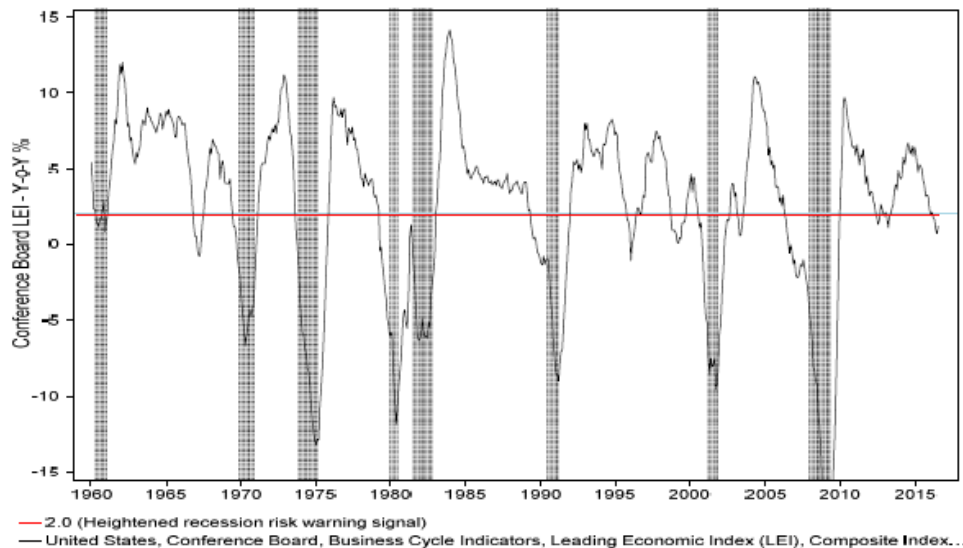**Figure 10: US recession indicators – Financial Conditions Indicators**

| No. | Indicator | Signal rule | Current recession warning signal (Y/N) | Historical time from signal to recession (range) | Efficacy | Comment |
|-----|-----------|-------------|------------------------------------------|---------------------------------------------------|----------|---------|
| 6 | US HY corporate bond spreads | Sustained trend higher = heightened recession risk | **Yes & No** (signal notably dissipated in recent months) | Typically multi month (longer from 1998) | Indicative although not conclusive | Spreads have narrowed recently following a widening phase from mid–2014 through to Feb 2016 |
| 6a | US financial conditions indicators (other) | No clear strong indicators | Not relevant | | Nothing consistent / usable | |
| 6b | NACM index | Limited data | Yes (growing) | Not known | Limited data | Interesting and clear tightening of credit conditions on this measure |

Source: Longview Economics.

## 5. Leading Economic Indicators

Leading Economic Indicators (LEIs) are mixed in their ability to generate timely and robust recession warnings. We examined the conference board and the OECD US LEIs. The Conference Board indicators generate better, more efficient recession warnings. Currently there is a recession signal (Figure 11), albeit since the mid–1990s, there have been a number of false signals.

Figure 11: US Conference Board Leading Economic Indicators Y-o-Y %
Sub 2% annual growth is a recession warning. Since mid-1990s, there have been a number of false warnings (e.g. 2012 & 2003).



- 2.0 (Heightened recession risk warning signal)
— United States, Conference Board, Business Cycle Indicators, Leading Economic Index (LEI), Composite Index...

Sources: Longview Economics, Macrobond.

Figure 12: Leading Economic Indicators

| No. | Indicator | Signal rule | Current recession warning signal (Y/N) | Historical time from signal to recession (range) | Efficacy | Comment |
|---|---|---|---|---|---|---|
| 7 | Conference Board US LEI Y-o-Y | Move below 2% Y-o-Y growth | **Yes** – since Mar '16 | Between 0 to 19 months (most 2 to 9 months) | 8 out of 12 signals correct since 1960 | Generally a good indicator – doesn't always signal much ahead of recession though |
| 7a | OECD US LEI Y-o-Y | Limited use | Not relevant | | Weak indicator | No clear early warning system – generally signals late |

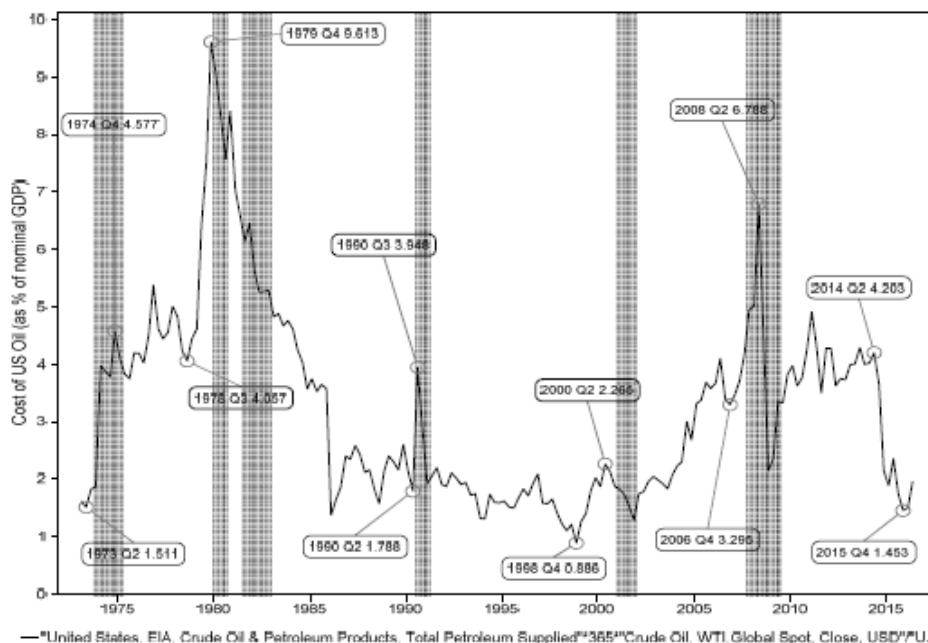Source: Longview Economics.

## 6. Other indicators

Over and above the factors in 1.1 to 1.5 above, the oil price, at least historically, has played an important role in generating recessions. Oil price spikes have drained corporate cashflows (especially during the earlier years analysed) and impacted householders' ability to consume (i.e. indirectly drained corporate cashflows).

Figure 13 shows the rise in the cost of US oil in all recessions back to the mid-1970s. In the mid-1970s, the cost of US oil spiked by 3pp of GDP in 6 quarters; it rose by over 5pp of GDP in 5 quarters in the late 1970s; in 1990, it rose by 2pp in 1 quarter; into 2000, it rose by 1.4pp of GDP; and, in the GFC by 3.5pp of GDP. Given a significant portion of US oil is imported, this acts as a drain on US cashflows. Unusually, though, in this economic expansion, the cost of oil has fallen as the corporate financing gap has deteriorated. As Figure 14 shows, this is the first time that has occurred since the start of the data.

**Figure 13: US cost of OIL (as % of GDP) – shown with US recessions**
The majority of US recessions in recent decades have been preceded by an oil price spike. In the run-up to the 2000-01 recession, the spike was reasonably muted. In all other recessions shown, it's been reasonably significant.



Sources:   Longview Economics, Macrobond

**Figure 14:  Cost of US oil vs US corporate financing gap (both as % of GDP)**

In prior cycles, a sharp rise in the cost of oil has contributed to a deterioration in the corporate financing gap, both directly (as companies oil bills rise) and, perhaps more importantly, indirectly, as households cash-flows deteriorate with an impact on their spending. In this cycle, that relationship has changed, perhaps in part reflecting the increase in US oil production in recent years.
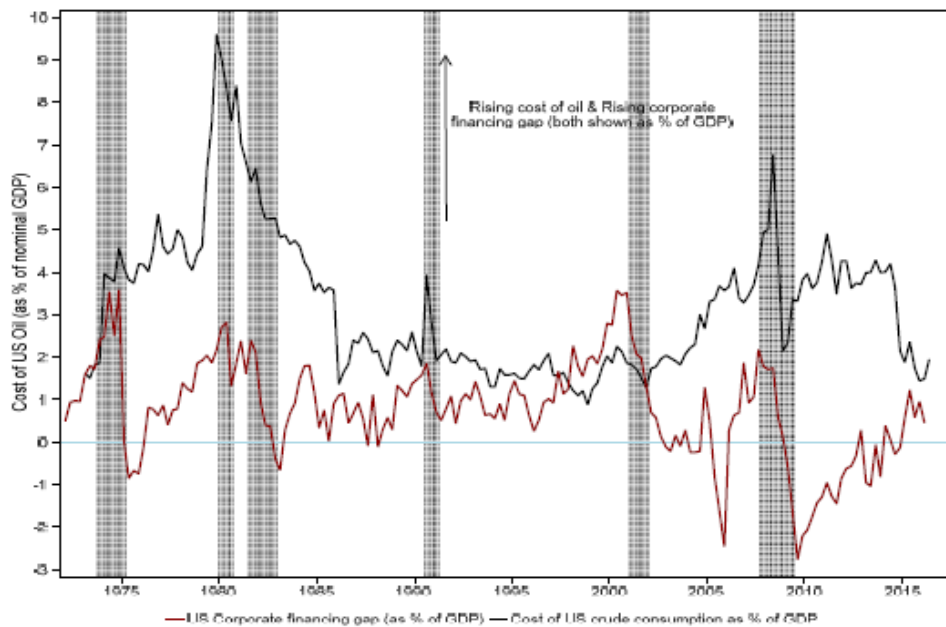


Sources:   Longview Economics, Macrobond

Figure 15: Other Indicators

| No. | Indicator | Signal rule | Current recession warning signal (Y/N) | Historical time from signal to recession (range) | Efficacy | Comment |
|-----|-----------|-------------|----------------------------------------|--------------------------------------------------|----------|---------|
| 8 | US jobless claims | **Turn upwards** in 26 week moving average | **No** | Either just before or during a recession) | Weak indicator | Noisy indicator(despite 26 week smoothed) – also typically late to signal a recession |
| 9 | US Household wealth effect | **A sustained slowdown to 5% Y-o-Y growth orlower** | **Yes** | Typically within 3 quarters (or coincident) | Mixed | Not a clear signal |

Source: Longview Economics.

CONCLUSION

A broad analysis of generally effective indicators of recessions leads to the conclusion that US recession risks are clearly continuing to rise. A wide range of indicators confirm that message:

- The state of health of the corporate sector, for example, continues to deteriorate.

- Corporate credit conditions are tightening.

- Key leading indicators are in recession territory, while there has been a monetary tightening potentially sufficient to cause a recession.

Some doubts, however, remain. Certain indicators are behaving in an unusual and inconsistent manner compared to their behaviour in prior recession build-ups:

- US high yield corporate bond spreads have eased dramatically in recent months

- The US yield curve hasn't inverted (although maybe can't in a ZIRP environment) while the fall in the oil price has somewhat supported the US economy (albeit not to the

extent expected prior to the fall – see Global Macro Report, 1 June 2016 "US Consumer Spending Puzzle").

Three graphs, laid out below, square the circle.

They point to asset markets which have been artificially manipulated by excessive liquidity from global central banks (i.e. unconventional monetary policy), thereby arguably allowing confidence to be maintained amongst companies and households to continue to benefit from a wealth effect. Both the Japanese and the Swiss national central banks, for example, are now buying equities with newly created money (the SNB, for example, owns approximately US$1.5bn of Facebook shares). The ECB (& BoE) are buying corporate bonds with newly created money. Several central banks have, of course, been buying government bonds with new money. Clearly, a level of artificiality has been introduced into global financial markets and asset prices.

That's confirmed by the breakdown in the relationship between US equity volatility and the corporate sector debt levels. Higher corporate borrowing leads to rising indebtedness and should translate to higher risk levels (i.e. higher VIX). Volatility, though, appears to have been dampened – quite probably by central bank largesse. Companies aggressively buying their own shares have also contributed (funded in aggregate by cheap debt issuance – Figure 18). As the UK's FTSE All share index further illustrates, it's the excess liquidity and a PE ratio re-rating that has been pushing the market higher, not fundamentals (i.e. earnings growth). Indeed, this is the first UK equity bull market where equities have gone up while earnings have gone down (Figure 16).

**Figure 16:  UK FTSE all share price index vs all share consensus forward EPS**
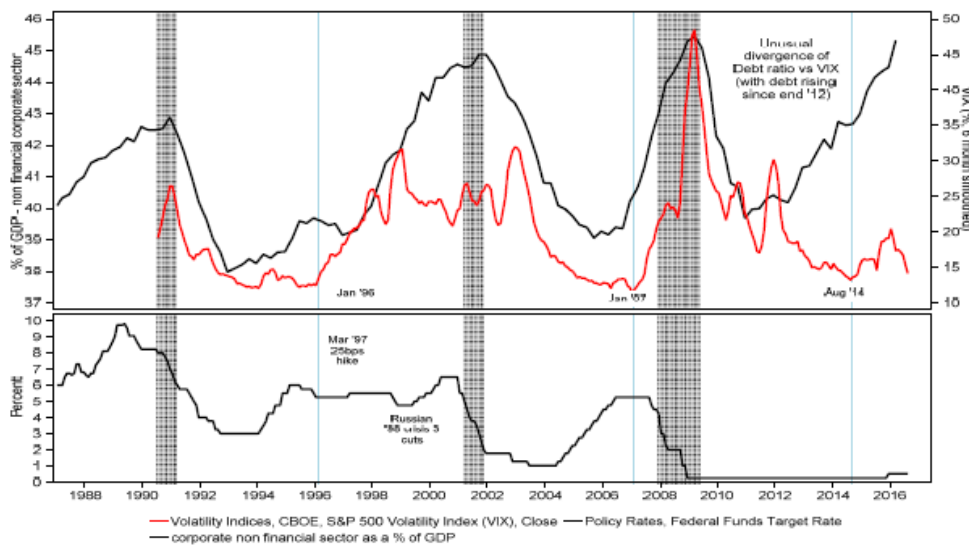


Sources:   Longview Economics, Macrobond

Going forward, the immediate risk for the Bears is the introduction of more fiscal stimulus – whether paid for with newly created or borrowed money. This is something that both current US presidential candidates have outlined. It's also occurring in China with a widening of the fiscal deficit target. This could add to the tepid current global growth rates, as well as push bond yields higher, thereby encouraging a rotation into equities.

Equally, on the flipside, the immediate risks for the Bulls are signs of rising inflation (especially in the US). This would likely hasten US rate rises, thereby tightening liquidity and potentially bringing about the start of a reconnection of asset prices with their fundamentals. Indeed, if our recent analysis of US inflation pressures is correct (see Global Macro Report, 8 August 2016: "Building US Inflation Risks") then, arguably, this is the greater risk. Much also depends on the Fed's reaction function.
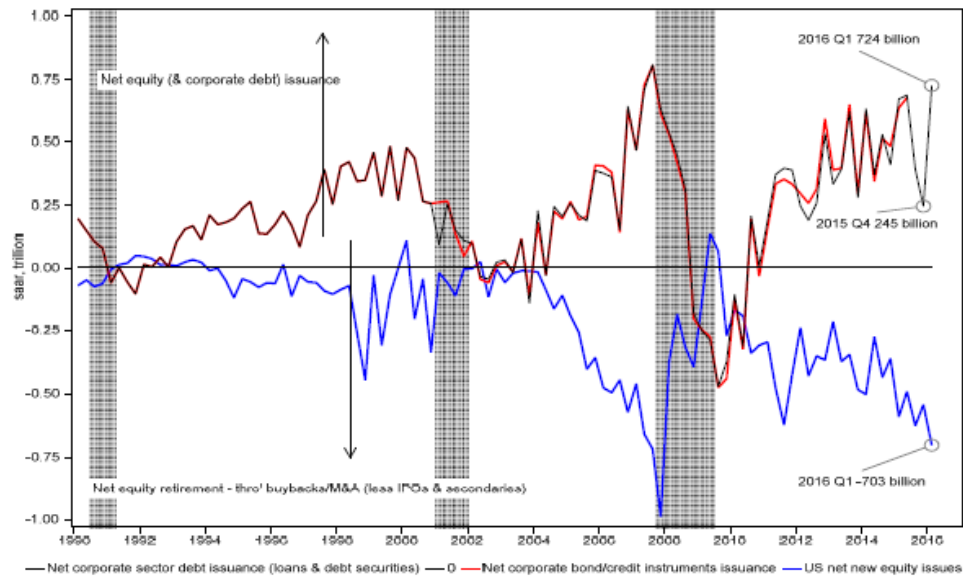
All of these factors will need to be closely watched.

**Figure 17:  US Corporate sector debt to GDP – shown against trend in the VIX (6 month smoothed)**



Sources:   Longview Economics, Macrobond.

Figure 18: US Corporate sector: Net new equity & corporate debt issuance/retirement (US$tr, saar)



Sources: Longview Economics, Macrobond

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