Research

January 22, 2009

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US: Manufacturing recovery ahead

- Since late summer last year US, and global manufacturing activity has entered a severe contraction due to a combined shock from the credit crunch and a collapse in demand growth. Most business indicators – including the US ISM index – are on levels only seen in the deepest post-WWII recessions.

- However, much of the adjustment in the US manufacturing industry has already taken place. First, prior to the recession the US manufacturing industry ran very lean inventories. Second, the liquidity squeeze from the credit crisis has led to an unusually fast alignment of production to demand fundamentals. Consequently, the pace of production is now undershooting the slowdown in demand. Hence, it will merely take stabilisation in demand growth to spark an industrial recovery.

- If credit spreads do not resume widening we believe that the US ISM index will see imminent stabilisation and a subsequent recovery over the coming three to six months. We expect the index to reach 42-44 by June, which would be consistent with zero GDP growth. If monetary and fiscal policy gets traction further recovery is on the cards for H2.

- A recovery in the ISM index will be the first sign of improvement in several other indicators. Aside from the obvious correlation with manufacturing production, the ISM usually correlates closely with leading indicators, trade, jobless claims and capital goods orders. Hence, we expect that improvement in these indicators over the coming quarters will support a general improvement in sentiment.

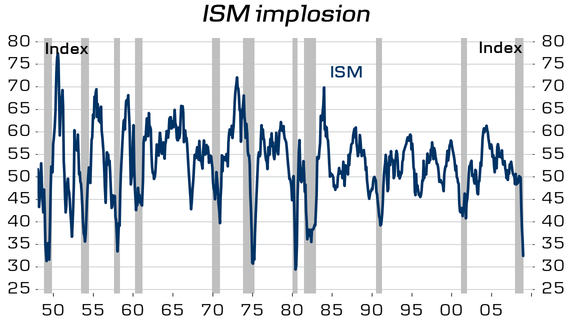
- In financial markets this will be a very important event. A recovery in the ISM index usually adds upward pressure to long US bond yields and to the steepness of the money market curve. Moreover, a pick-up in the ISM index will be a signal of a future stabilisation in corporate earnings.

Bottoming out

Manufacturing in deep recessionary territory

Since the credit crisis escalated to unimaginable levels in the wake of the failure of Lehman in September, business indicators in the US – and elsewhere in the world – have experienced virtual collapse.

ISM implosion



Source: Ecowin and Danske Bank

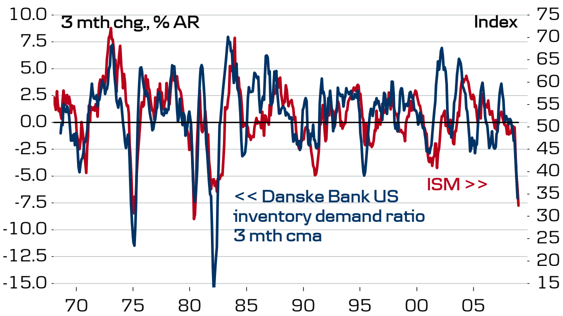
Note: Gray shaded areas represent NBER US recessions

Over a period of only four months the ISM manufacturing index, has dropped from a neutral level (49.9 in August) to signalling deep recession (32.4 in December). Such deep and rapid deterioration has only been experienced six times in the 60-year history of the index – and all these events happened prior to the 'Great Moderation'.

Manufacturing already aligned with fundamentals

Usually the ISM index – i.e. manufacturing production – reacts with a lag of three to six months to the relationship between inventories and demand. That is when shipments are rising faster than inventories businesses ramp up production in the subsequent months to keep pace with demand – i.e. the ISM index increases, and *vice versa*. This is demonstrated in the chart below showing Danske Bank US inventory demand ratio versus the ISM index.

Inventory dynamics drive the ISM

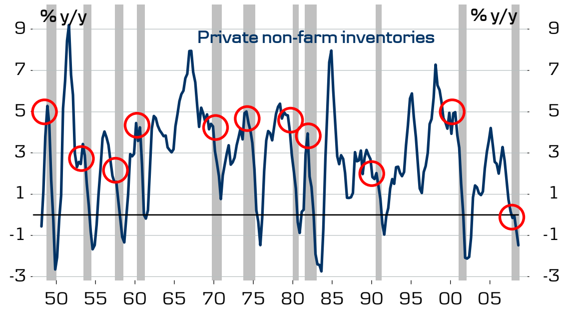


Note: Inventory demand ratio = (Consumer goods demand + export demand for consumer goods + non-defence capital goods orders) / (Manufacturing finished goods inventories).
Source: Ecowin and Danske Bank

When the credit crunch hit the economy in September demand was already on a slowing trend and the manufacturing industry was gradually reducing the pace of production growth to keep inventories aligned.

In fact the non-farm business sector seems to have been pursuing an unusually cautious inventory management leading up to the financial crisis. The growth rate in US non-farm business inventories has never before been so slow at the onset of a recession back in Q4 2007. In general, there were very limited signs of any inventory misalignments when the credit crunch hit the economy in September.

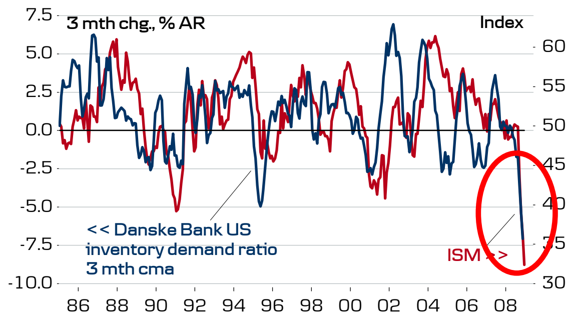
The most cautious inventory management ever



Source: Ecowin and Danske Bank

But clearly some unusual dynamics developed in the manufacturing sector late last year, when the ISM index suddenly collapsed. As is clear from the chart below (again charting the inventory/demand ratio versus the ISM), the US manufacturing industry has been reacting in an extremely timely fashion to the slowdown in demand compared with historical patterns. The pace of production appears already very well-aligned to underlying fundamentals. Put differently, there is very little negative backlog in the manufacturing industry.

ISM adjusting very fast to fundamentals



Source: Ecowin and Danske Bank

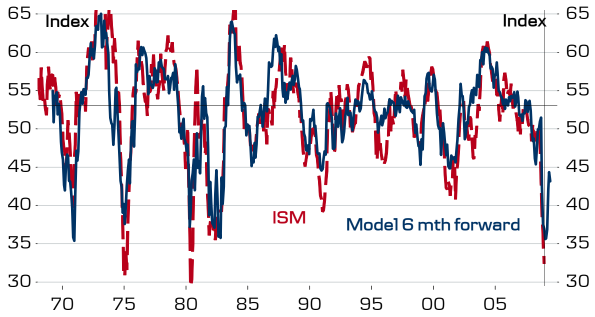
We believe that the unusual fast reaction has been forced by the credit crisis, which hit the real economy in September. As businesses had increasing problems accessing liquidity in the banking sector and the markets, cash had to be freed up from other sources. One obvious way to do so is to reduce inventories and stop ordering input supplies. In this way the crisis has created its own negative dynamics on top of the 'normal' pattern of reaction to a demand slowdown (see illustration on page 4).

Further the problems in trade financing – another spin-off from the credit crisis – has probably amplified the slowdown in global trade and manufacturing.

Box: ISM and the credit crunch

To assess the impact of the credit crisis we have refined our ISM modelling framework. *First*, we have learnt that the current change in the long-term Baa credit spread (vs 10-year Treasuries) is serving as a useful measure of the impact from the credit crisis. Adding this variable to our modelling framework explains a great deal of the current downturn (c.f. the chart below). *Second*, we have extended the estimation period back to 1969 to include the deep recessions of 1970s and 1980s. This should increase the robustness of the model.

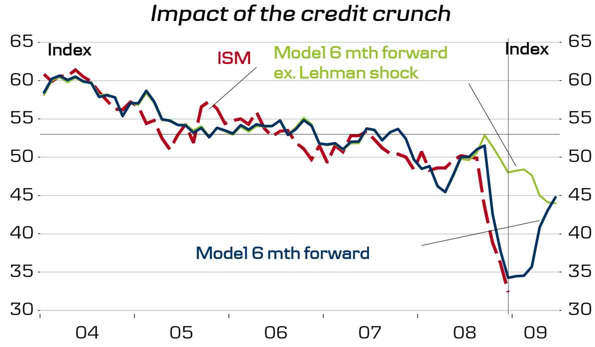
ISM model estimated from 1969 to present



Note: The model is estimated on the period 1969 to present. See appendix for details.
Source: Ecowin and Danske Bank

To illustrate the negative dynamics created by the Lehman shock, we have simulated the model with unchanged credit and equity prices from August through December. The results reveal that the shock to the financial sector during the autumn takes out between 10-15 index points over Q4 and Q1. This is equivalent to 2-3 percentage point of quarterly annualised GDP growth.

Impact of the credit crunch



Source: Ecowin and Danske Bank

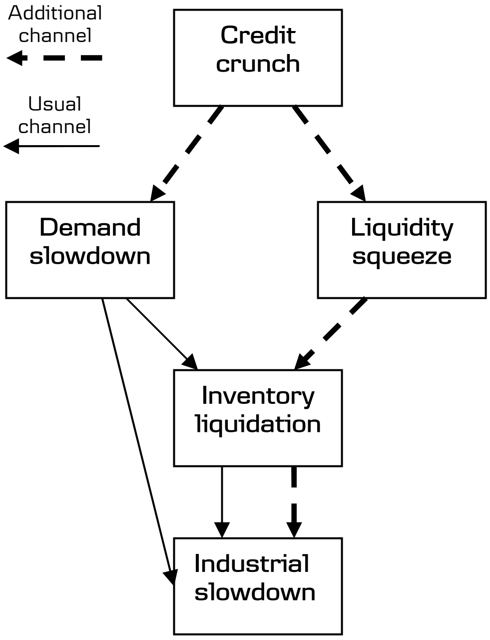
ISM six-month forward model

(estimated 1969-present)

Variable	Coefficients	Prob-value
Intercept	51.706	0.0000
Inventory demand balance, c.o.p 6 months, lag 7	0.339	0.0000
Credit Spread, c.o.p val 6 months	-0.052	0.0000
Conferenc Board Consumer confidence, c.o.p val 6 months, lag 6	0.075	0.0000
Real money supply, c.o.p 6 months, lag 6	0.794	0.0000
S&P 500 Composite, c.o.p 6 months, lag 6	0.059	0.0009
Real Broad Effective Exchange Rate, c.o.p val 6 months, lag 6	-0.309	0.0000
Real Broad Effective Exchange Rate, c.o.p val 6 months, lag 12	-0.242	0.0000
Probit model + 6 mth, c.o.p val 6 months	-3.497	0.0000
Real 3 mth libor, lag 12	-0.342	0.0001

Source: Ecowin and Danske Bank

A liquidity and credit channel



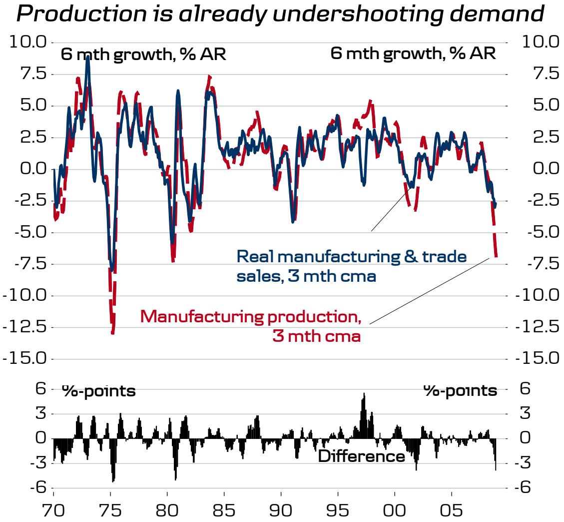
Source: Danske Bank

ISM recovery coming up!

Going forward, we believe that there are several indications of a recovery in manufacturing over the coming three to six months.

First, the extremely fast and deep slowdown in manufacturing production from a level with already relatively lean inventories is leaving the manufacturing sector well positioned for recovery when demand begins to stabilise.

Production is already undershooting demand

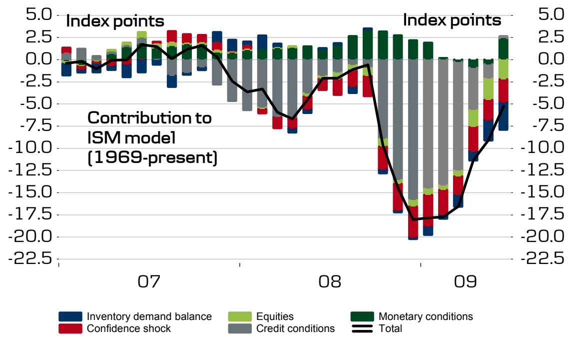


Source: Danske Bank and Ecowin

The current rate of contraction in manufacturing production is already undershooting the slowdown in demand significantly, which implies that inventories will be reduced very fast going forward. Hence, it will only take moderation in the rate of decline in demand growth to spark a stabilisation in industrial production (which would correspond to a recovery in the ISM).

Second, credit markets are showing tentative signs of improving. Our modelling suggests that manufacturing growth (i.e. the level of ISM) reacts to the changes, not the level, of the credit spread. Hence, the negative impact of the credit shock should be peaking soon. Hence, stabilisation in the credit markets will be the main driver behind a recovery in the ISM, as the decomposition of the ISM in the chart below suggests.

Impact of the credit crunch and other factors

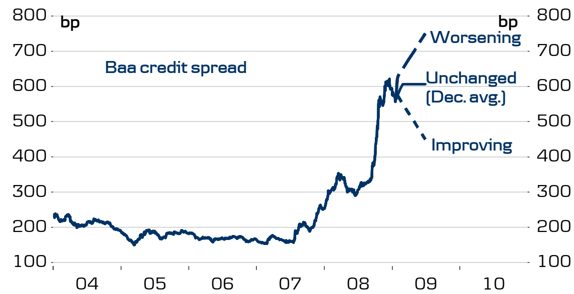


Note: Contributions from various factors in the ISM model estimated 1969-present (see above). The simulation is based on the naïve assumption of unchanged credit spreads. No other assumptions have been taken.

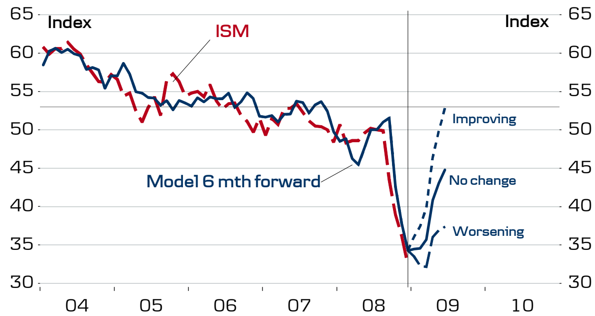
Source: Danske Bank and Ecowin

The behaviour in credit markets (i.e. the credit spread) will have crucial implications for the strength of ISM recovery, c.f. the scenarios below.

Three scenarios for the credit markets...



... and the ISM

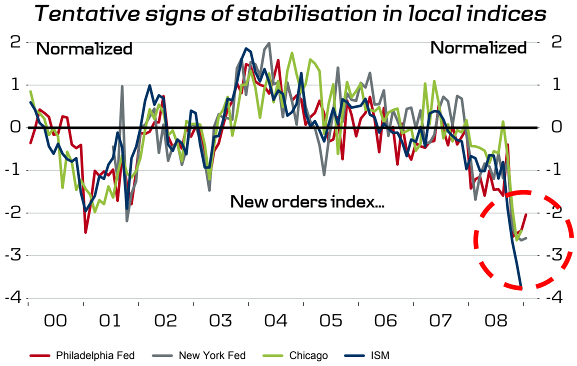


Note: The model applied is the model estimated in the box above. Source: Danske Bank and Ecowin

The conclusions from the scenarios above are straightforward. Even if the credit market starts to deteriorate again, the ISM will probably not go much lower. On the other hand, if the credit spread takes just one-third of its widening back in the coming six months, the ISM could recovery much stronger than we forecast in our baseline scenario.

Third, some tentative signs of stabilisation in some of the more prominent local manufacturing surveys are visible. This is demonstrated in the chart below, which is showing a standardised version of the new orders index in the Philadelphia Fed index, the Chicago index and the Empire manufacturing index.

Tentative signs of stabilisation in local indices

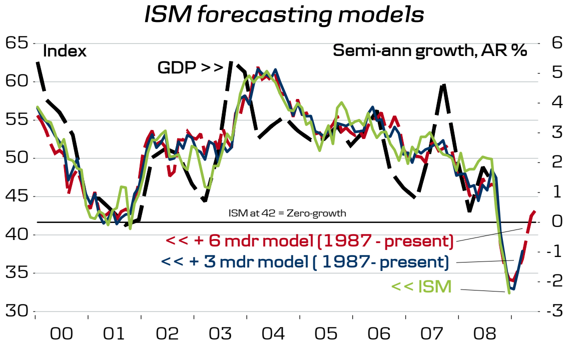


Source: Danske Banks and Ecowin

What kind of a recovery?

Summing up, we conclude that the ISM is very close to a trough and will recover to the 42-44 range in the next six months *if credit spreads do not resume widening*. This is illustrated in the three and six month forward models for ISM below.

ISM forecasting models



Note: The 3 and 6 months forward model is a refined version of our long sample 6 months forward ISM model described above. These models are estimated in the period 1987 to present on a similar set of variables. See appendix for details.

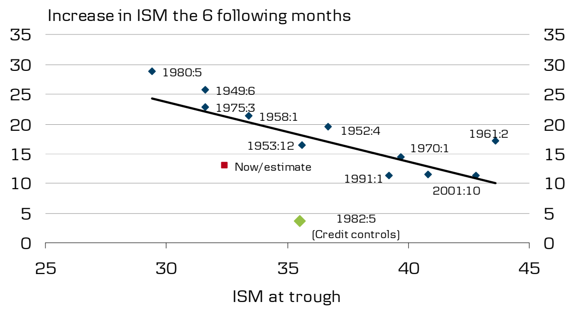
Source: Danske Bank and Ecowin

A recovery of this magnitude would be consistent with the economy returning to around zero growth at some point in Q2. Hence, the economy is likely to still be very soft in six months, but the outlook will be much better than today. In a historical context the recovery that we forecast is by no means exceptional. The plots below show some experience from earlier recessions.

Two conclusions stand out:

First, the deeper the downturn the faster the ISM index recovers, when it turns around (see the following chart).

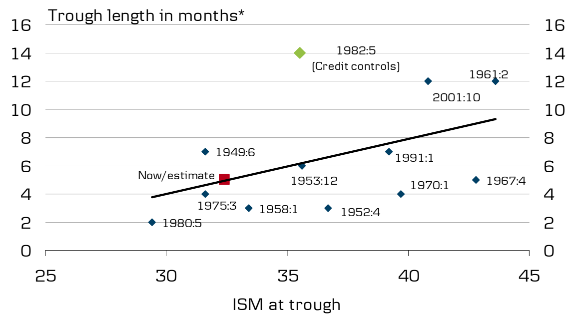
The deeper the downturn, the faster the recovery



Source: Danske Bank and Ecowin

Second, the deeper the downturn usually implies that the duration of the trough in the ISM index is shorter (see the chart below).

The deeper the downturn, the shorter the duration



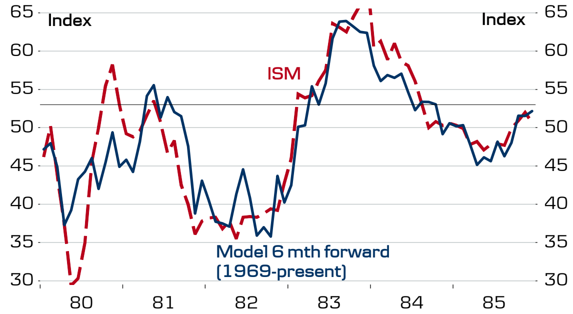
Source: Danske Bank and Ecowin

We have plotted our current forecast into the charts above to demonstrate that it fits well with the historical patterns.

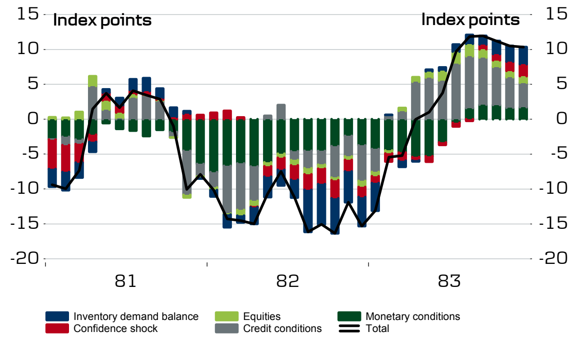
The 1982 recession, which was also accompanied by significant credit contractions, stands out. In this case the downturn was longer and the recovery was softer than usual. Given the current situation in credit markets, this could suggest that there is some downside risk to our forecast that we cannot capture in our framework.

However, as the following charts suggest there was nothing unusual happening in the ISM index in 1982. According to our modelling framework, the slow recovery was simply a consequence of very tight monetary conditions under the Volker Fed and a subsequent drag from slowing demand growth.

The model in 1982...



... and the contributing factors

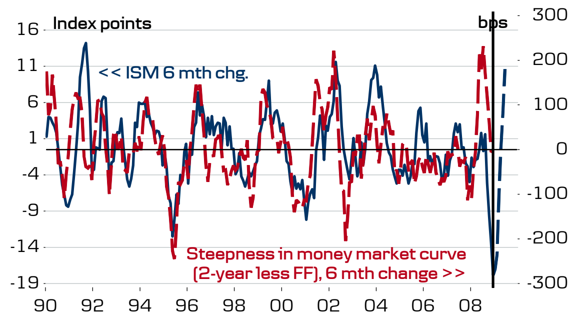


Source: Danske Bank and Ecowin

Financial implications

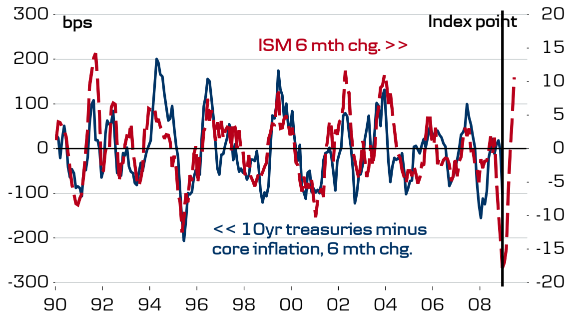
A recovery in the ISM is usually an important event in the financial markets. In the fixed income markets it is usually an indicator of steeper money market curves and higher long bond yields.

Steepness of money market curve



Source: Danske Bank and Ecowin

10-year bond yields and ISM



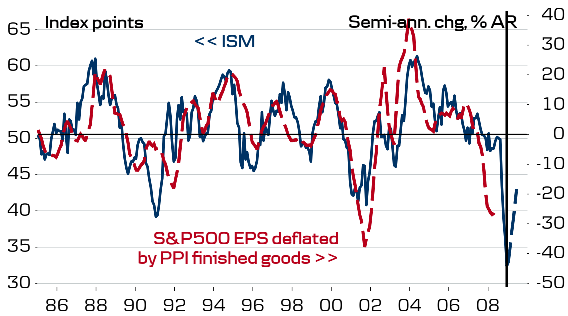
Source: Danske Bank and Ecowin

Generally, we look for higher long bond yields over the course of 2009. Indeed the forecast recovery in the ISM index is a part of this view.

That said dynamics may be somewhat different this time around as the Fed has switched to Zero Interest Rate Policy and Quantitative Easing. In an upcoming research paper we intend to take a broader look of the themes that will drive US bond markets going forward.

In equity markets a recovery in the ISM is usually a signal that growth in S&P500 EPS (earnings per share) will pick-up. However, note that the ISM forecast suggests that earnings growth will remain negative – but decline at a slower rate.

S&P500 EPS and ISM



Source: Danske Bank and Ecowin

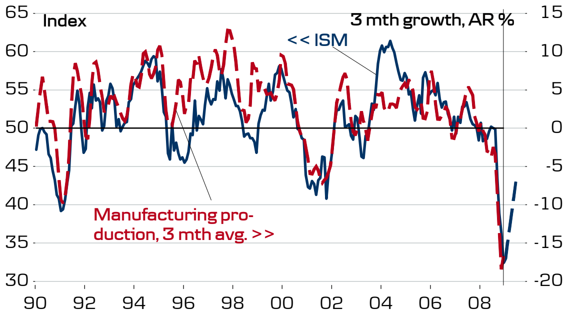
That said the relationship between the ISM the price return of the S&P500 is more ambiguous. See *Strategy Briefer: Seeking bottom – five key factors to monitor closely* January 16, 2009 for more on the ISM and equity markets.

Macroeconomic implications of an ISM recovery

Macroeconomic implications

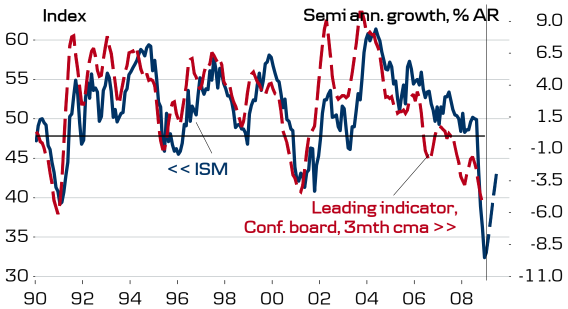
A turnaround in the ISM is usually one of the earliest recovery signals that we receive from the US economy. When the ISM recovers we should expect the range of data to improve including manufacturing production, the US leading indicator, initial claims, non-defence capital goods orders and trade numbers.

Manufacturing production and ISM



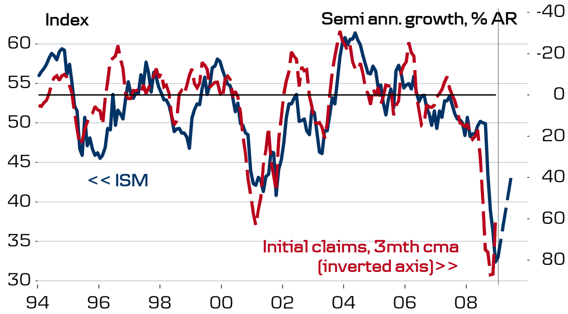
Source: Danske Bank and Ecowin

Leading indicators and ISM



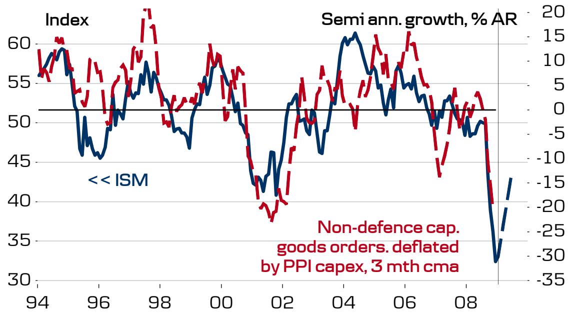
Source: Danske Bank and Ecowin

Initial claims and ISM



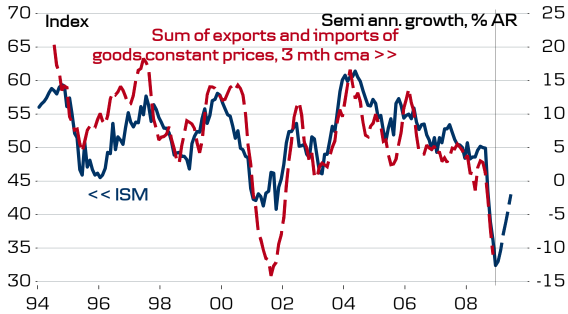
Source: Danske Bank and Ecowin

Capex and ISM



Source: Danske Bank and Ecowin

Trade and ISM



Source: Danske Bank and Ecowin

Appendix ISM models

Six-month forward model for ISM level
(1987 to present)

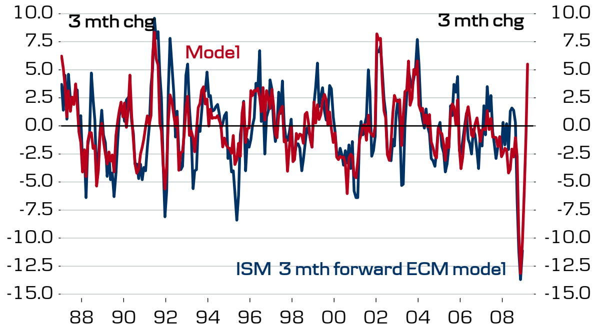
Variable	Coefficients	Prob-value
Intercept	52.006	0.00000
Inventory demand balance, c.o.p 6 months, lag 7	0.351	0.00000
Credit Spread, c.o.p val 6 months	-0.042	0.00000
Conferenc Board Consumer confidence, c.o.p val 6 months, lag 6	0.103	0.00000
Real money supply, c.o.p 6 months, lag 6	0.512	0.00000
S&P500 Composite, c.o.p 6 months, lag 6	0.116	0.00000
Real Broad Effective Exchange Rate, c.o.p val 6 months, lag 6	-0.234	0.00000
Real Broad Effective Exchange Rate, c.o.p val 6 months, lag 12	-0.114	0.00885
Probit model + 6 mth, c.o.p val 6 months	-4.452	0.00000
Real 3 mth libor, lag 12	-0.740	0.00000
Real 10 year treasury yield, c.o.p val 6 months, lag 18	-1.155	0.00000

Three-month forward ECM model for changes in ISM over three months
(1987 to present)

Variable	Coefficients	Prob-value
Intercept	-1.221	0.45772
Inventory demand balance, c.o.p 3 months, lag 4	0.301	0.00000
Forecast from ISM 6 mth fwd model (1987 - present)	0.721	0.00000
World, Energy, Oil, Brent, ICE, Average, USD, c.o.p val 3 months, c.o.p val 3	-0.065	0.00084
Real Goods consumption, c.o.p 3 months, lag 3	0.288	0.00842
United States, Business Surveys, ISM Manufacturing, PMI total, SA, lag 3	-0.705	0.00000

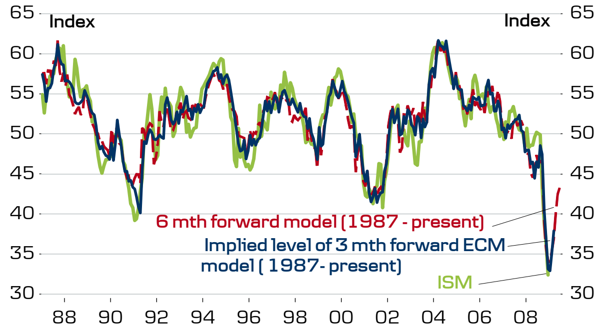
Source: Danske Bank and Ecowin

3 mth forward ECM model for changes in the ISM over three months



Source: Danske Bank and Ecowin

Implied level of 3 mth forward ECM model and the 6 mth forward model



Source: Danske Bank and Ecowin

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First date of publication

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