United States

Comparisons of US manufacturing output 'soft data' accuracy

- **IHS Markit PMI survey data relating to US manufacturing output outperform the ISM in terms of higher correlation, identifying turning points and suffering from less noise.**

- **Analysts are therefore encouraging to incorporate IHS Markit data into nowcast and forecast models**

Many US economic nowcast and forecast models use the ISM manufacturing survey data as an input, but statistical analysis suggest IHS Markit's PMI survey may act a more useful component to such models.

Correlations

In the first instance, as a 'soft data' advance guide to hard (official) data on manufacturing output, the IHS Markit PMI has outperformed the ISM in recent years. Although the ISM series has a longer history, the data have significantly overstated manufacturing growth since late-2016, resulting in upward bias to many growth models and nowcasts. IHS Markit data, in contrast, have shown no such upward bias and have consequently exhibited a significantly higher correlation with the official data.

Comparing both manufacturing survey output indices with the comparable Fed's measure of factory production over the past ten years (using a three-month-on-three month percent change), the IHS Markit data have exhibited an 89% correlation with the official data while the ISM's correlation is just 81%
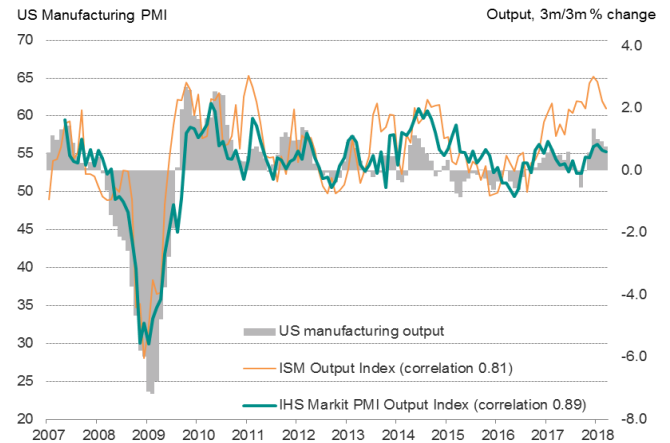
Turning points

Correlation is not just everything, however, as it's clearly important fur surveys to accurate indicate turning points. With the exception of the period 2014-15, when the growth trend in the official data appears to have been distorted, the IHS Markit data have identified every major turning point in the US manufacturing cycle over the past ten years (based on using three months moving averages of the survey and official data to identify turning points). In contrast, the ISM survey data have missed recent turning points.
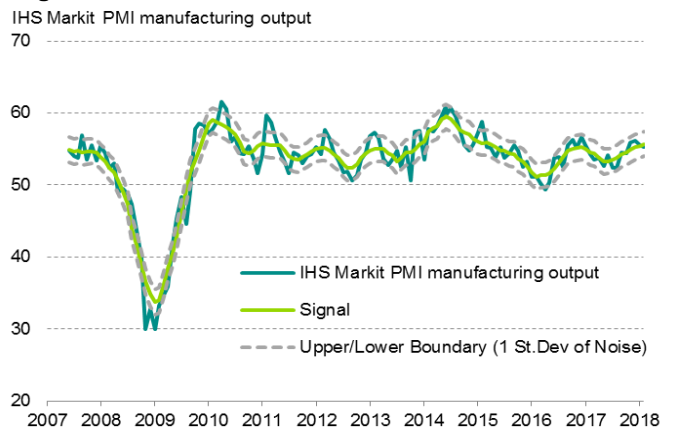
Signals and noise

Comparisons of the manufacturing output indices from the IHS Markit and ISM surveys over the past 10 years also highlight the extent to which HIS Markit data exhibit a far better signal to noise ratio than the ISM, exhibiting far lower volatility than the ISM output series and consequently making turning points easier to identify, growth rates easier to estimate and sending fewer signals.
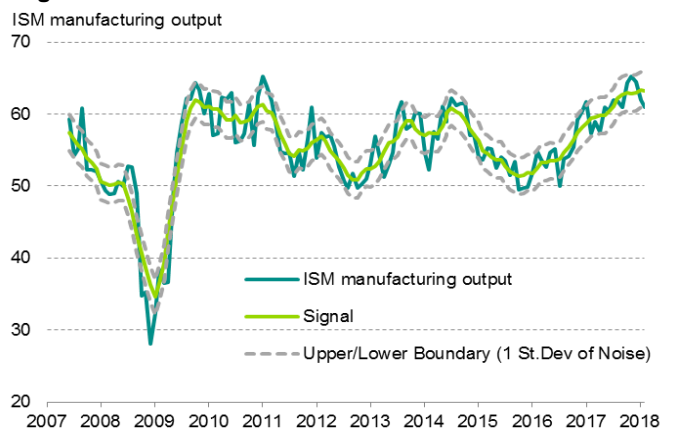
Surveys of US manufacturing output

![Chart: US Manufacturing PMI vs Output 3m/3m % change, 2007-2018. US manufacturing output (bars), ISM Output Index (correlation 0.81), IHS Markit PMI Output Index (correlation 0.89)](chart)

Sources: IHS Markit, ISM, US Federal Reserve.

Signal and noise in the IHS Markit data

![Chart: IHS Markit PMI manufacturing output with Signal and Upper/Lower Boundary (1 St.Dev of Noise), 2007-2018](chart)

Signal and noise in the ISM data

![Chart: ISM manufacturing output with Signal and Upper/Lower Boundary (1 St.Dev of Noise), 2007-2018](chart)

Sources: IHS Markit, ISM.

In this example we measure 'noise' in the survey data as the extent to which each month's value varies against a seven-month centered moving average. Over the past decade, IHS Markit data have exhibited an average 'noise (or standard deviation) of just 1.8 index points compared to 2.5 for the ISM. The resulting 'bands of confidence' in which the two surveys' data can be interpreted are therefore very different, with a considerable greater degree of confidence being seen

for the signal of the IHS Markit PMI compared to the ISM data.

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