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Inside:

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Why the World Economy Needs Another Global Leading Indicator

Our new Global Leading Indicator is designed help market participants anticipate turning points in industrial production and the performance of asset markets ahead of those shifts

The last few months have demonstrated yet again the truth of the well-worn proposition that financial markets react well in advance of actual developments in the real economy. Beginning in late September 2001, global equity markets rallied strongly; global bond markets sold off sharply a few weeks later, even though at the time there were few concrete signs that real activity across the industrialized world was showing signs of recovery.

This is one reason why reliable forward-looking indicators of economic activity are so highly prized by financial markets—and all the more so because they are hard to find. At a minimum, a useful leading indicator for financial markets should have three properties:

- **It should be global.** Markets seem to move increasingly in tandem, and the latest cycle has been no exception, showing highly synchronized trends in both the real economy and global financial markets. As the trend toward greater integration among the world's economies and financial markets continues, it is expectations of turning points in the *global* economic cycle—rather than that of any individual country—that often drive the most significant shifts in financial markets.

- **It should be early.** Because markets filter and rapidly reflect information from a vast array of sources, it has become ever more crucial for investors to gather the earliest possible signals about the direction of the global economic cycle, so that they do not miss major shifts in the relative performance of bonds versus equities.

- **It should be independent of the market itself.** Although markets move well before economic trends, they are not always correct. Many equity markets rallied strongly in April and May 2001, with bonds selling off sharply, only to be later disappointed by the underlying economic trends. Sometimes what investors most need is a timely check on whether the economic turning points 'reflected' in the markets are truly imminent.

The Need for a New Leading Indicator

The pre-eminent (if not the only) formal leading indicator of global activity is the one published monthly by the OECD. It is highly correlated with the relative performance of bonds and equities, as well as with other financial-market returns. But the OECD LI recently appears to have become less useful, principally for two reasons:

- It may be too late for investors to act upon, given that it appears (even in preliminary form) five to six weeks after the end of the month. By then, markets have digested many of the main components of the indicator several weeks beforehand.

- A major determinant of the OECD LI is the equity market itself, which may lead financial markets to question how independent the indicator really is. If changes in the OECD LI are driven to a large degree by equity-market shifts—as they sometimes are—it is hard to be comfortable using this indicator to predict or validate equity-market performance.

Moreover, the OECD LI is not geared to the global cycle as such; it is simply the weighted average of individual country indicators. This approach may ignore some useful or early information. The timeliest signals of the global cycle need not be those signalling any particular country's cycle; nor do they necessarily have to come from within the OECD itself. If early signs of a global recovery show up first in Taiwanese exports or global copper prices, then it pays to have a broader outlook.

One alternative is to provide an indicator that turns well before the OECD LI. We have previously discussed our Longer Leading Indicator (LLI), which has historically led industrial production by about 11 months. The predictive powers of the LLI have proven to be reasonably good, but the long and rather variable lead times between it and industrial production limit its usefulness. Financial markets do not generally respond until more concrete signs of an imminent turning point appear. ■

The GS GLI: A Leading Indicator Designed for the Markets

Our new approach is much more ambitious than what we undertook with the LLI. We want to build a leading indicator that will prove more useful to investors than the OECD LI.

Like the OECD LI, the Goldman Sachs Global Leading Indicator (GLI) aims to provide a leading indicator of OECD industrial production. But unlike the OECD LI, our indicator is designed primarily as a tool for financial-market participants, not simply as a forecasting tool. We have deliberately excluded equity-market indices from our indicator, which allows us to be more confident that we are capturing information that is independent of the market itself.

Choosing the Right Variables

In designing the indicator, we have searched for components well beyond those included in the OECD LI. Some variables may be surprising, others may not. We have chosen them to capture a wide range of information about policy settings, the state of product and labor markets and global trade activity. The economic logic behind the choices varies, but, generally, each variable either influences the future course of activity or reflects information at very early stages of the production or demand cycle.

Impact of policy. The G7 yield curve and base money growth capture the stance of monetary policy, which influences economic activity with a lag. While the ongoing stance of fiscal policy can be seen as a missing component, it is difficult to incorporate this into a model, since shifts in fiscal policy can occur, and historically have occurred, at abrupt moments. But the economic impact of fiscal-policy changes should be seen in other variables.

Expectations. Consumer and business confidence series reflect both the expectations and the likely intentions of the two main sectors of the economy. They are also available on a timely basis, and they provide perhaps the most forward- looking information on business and consumer trends.

The inclusion of the trade-weighted Australian dollar in our indicator is as novel as it may seem. Because Australia is a major, reasonably diverse commodity producer, its currency is likely to reflect changing expectations about pressures on commodity markets quite quickly.

Early signals of demand in major markets. Initial claims and job vacancies give early readings on demand shifts in labor markets. New orders, the GS Industrial Metals Index and the GS Euroland Leading Indicator offer timely downstream readings on intermediate and final product cycles.

Early signals of global activity. A unique element of our model is the use of non-OECD economic variables for an OECD indicator. Taiwan exports illustrate how this can be helpful. Taiwan is a very open economy, heavily involved in technology, and it releases its trade data early. In this context, Taiwan export performance is a key to identifying the changing fortunes of the global economy.

How Does the GLI Perform?

The GLI performs well as a leading indicator of OECD industrial production, picking up the major turning points over the last decade with an average lead time of two months. Because it is available one month ahead of the OECD's own leading indicator, the GLI would in practice have signalled both the beginning and the end of the most recent downturn one month in advance.

Looking further back in time, the GLI would have signalled a turning point in OECD industrial production either at the same time as or before the OECD leading indicator in all but one instance since the start of the 1990s (the exception being in 1993). It also has a higher correlation with OECD industrial production than does the OECD's own leading indicator.

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Goldman Sachs Global Leading Indicator

Component	Lag Time (weeks after end of month)	Source
Trade-Weighted Australian Dollar	0	Reserve Bank of Australia
G7 Spreads (10-Year less 3-Month Interest Rates)	0	Goldman Sachs
GS Industrial Metals Index	0	Goldman Sachs
Monetary Base in US, Japan, UK	1	Federal Reserve Board; Bank of Japan; Bank of England
Consumer Confidence in US, Euroland, UK, Japan[1]	1	US Conference Board; EU Commission; GFK; Tankan; Bank of Japan
Business Confidence in US, Euroland, UK, Japan[1]	1	US Institute of Supply Management; EU Commission; CBI; Tankan; Bank of Japan
Job Vacancies in US, Japan, Germany, France, Canada	4	US Conference Board; Japanese Ministry of Labor; Deutsche Bundesbank; INSEE; Statistics Canada
US New Manufacturing Orders[2]	5	US Department of Commerce
US ISM	1	US Institute of Supply Management
US Inventories / New Orders (ISM)	1	US Institute of Supply Management
Taiwan Exports	1	Taiwan Customs Department
US Initial Unemployment Claims	1	US Department of Labor
Global Cargo Traffic	4	International Air Transport Association
GS Leading Indicator of Industrial Activity for Euroland	1	Goldman Sachs

[1]We extrapolate Japan, because the Tankan survey is quarterly.

[2]Excluding defense and aircraft; w e w eight the electronics and non-electronics components differently w ithin the aggregate.

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The GS GLI: A Leading Indicator Designed for the Markets

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We have conducted various statistical tests to assess the forecasting performance of the GLI against the OECD's measure. We find that our indicator performs better than the OECD's on a horizon up to three months. After three months the OECD LI is better, but financial markets typically treat with caution signals given that far in advance. At the margin, when looking for a signal that industrial production will turn in the immediate future, the GLI is superior. We also find that the GLI is superior, up to an average of six months, in predicting average rates of industrial production growth. The GLI is also notably better in predicting turning points in industrial production.

Predicting Asset-Price Fluctuations

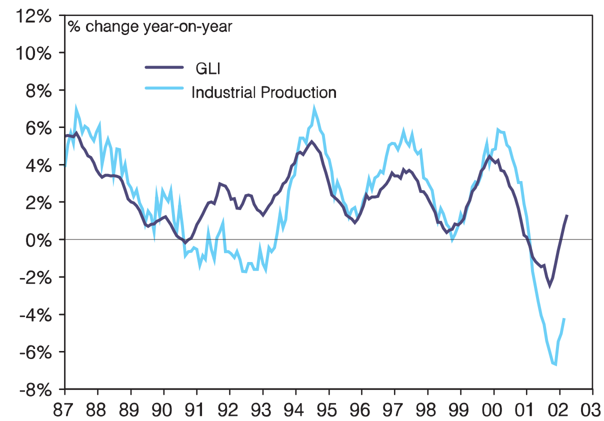
Using economic fundamentals to predict asset prices has proven to be useful over the long term. Over the short term, models using purely economic variables are less helpful, due to the 'noise' in asset prices and the speed with which information is processed and filtered into fluctuating prices.

Nonetheless, we find that our GLI does a reasonably good job of tracking the relative performance of global equities and bonds, and it does so ahead of the OECD LI. This is particularly reassuring since the GLI does not itself contain measures of the equity market.

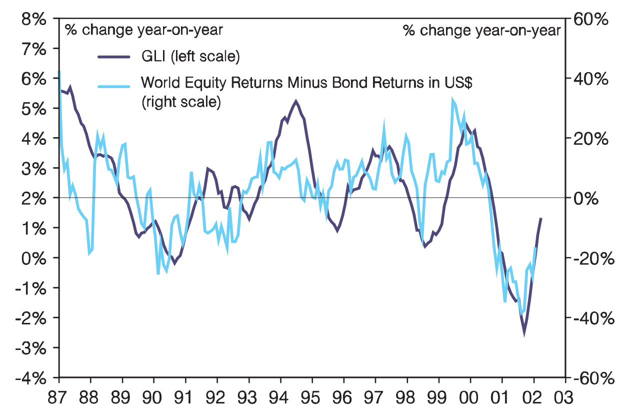
Avoiding False Moves in the Market

On several occasions the GLI has failed to anticipate major shifts in financial markets, but we do not think this undercuts its ability to *confirm* key financial-market shifts. It is not unusual for financial markets to anticipate economic recoveries or downturns that do not subsequently materialize (Paul Samuelson is famously reported to have joked that the US stock market had predicted nine of the last five US recessions). By providing an early signal of a turn in industrial production, the GLI may in fact help investors avoid being 'faked out' by pure market movements. ■

The GLI Signals Major Turning Points in Industrial Production . . .



. . . and in World Equity Returns Minus Bond Returns



GLI Points to a Continuing Recovery—But Watch This Space

Goldman Sachs Economic Forecasts						
%	GDP			CPI		
	2001	2002	2003	2001	2002	2003
US	1.2	2.6	3.0	2.8	1.8	2.0
Japan	(0.6)	(0.6)	0.9	(0.8)	(1.0)	(0.5)
Euroland	1.5	0.9	2.4	2.5	2.2	1.6
G7	1.0	1.6	2.5	2.0	1.4	1.5

The GLI signalled the peak of the latest economic cycle in December 1999; the reading would have been available the first week of January 2000. The lowest value was seen in October 2001, with the first sign of a pick-up seen in November's data. This reading would have been available in early December, a month ahead of the OECD LI. Although financial markets had already moved significantly by that point, it was still far from clear from most conventional data at the time that trends in the global cycle would validate those movements.

Since its trough, the GLI has moved steadily higher, retracing much of the decline experienced in 2001. In fact, each component of the GLI has now recorded a trough, suggesting that the evidence supporting the current upswing is broad-based.

Although the turning point in the GLI is now a few months behind us, the need to monitor forward indicators closely persists. There is still plenty of uncertainty over both the form the recovery will take and its durability. In the modern economy, with synchronized global risks, cycles can often be short. Moreover, across the major economies, the pickup in final demand is still delicately balanced. Economic imbalances in the US economy still need to be resolved, and there are risks that these may not play out in a benign way. Oil prices in particular remain an unpredictable risk, as Federal Reserve Chairman Greenspan has recently highlighted.

Recent Readings Show No Signs of a 'Double Dip'

The May GLI reading was 2.9%, up from 2.6% in April and showing a strong increase since the 2.2% reading in March. We see no signals of the 'double-dip' slowdown that some investors fear. Our own forecasts point to an uninterrupted and relatively synchronized global recovery, albeit one that is quite muted compared to previous cycles.

The index rose in May due to a large jump in Taiwan exports and an improvement in business confidence. The deterioration in consumer confidence appears to have moderated because of an improvement across all countries; the May ISM reading in the US was up significantly, rising to 32.3% year-on-year from 24.8% in April.

We are confident that the GLI and the broad approach we have adopted will warn of any upcoming 'double dip' should one be in danger of materializing. To facilitate this we will provide a threshold value each month that, if breached, will alert us.

If we had used a similar approach in 2001, we would have flagged the deterioration in the GLI in both September and October. Given the average two-month lead over industrial production, this would have translated into a warning of particularly severe readings in November and December. As it turned out, this was when the fall in industrial production was at its worst.

For the next GLI reading, the provisional number for June, the threshold value is 2.1%. If the reading is below 2.1% at that time, the magnitude of the fall would make us concerned that recovery is not as robust as we have assumed. ■

GS Global Leading Indicator Readings		
% change year-on-year	Confirmed Reading	Provisional Reading[1]
April 2001	(0.93)	(1.41)
May 2001	(1.17)	(1.53)
June 2001	(1.32)	(1.30)
July 2001	(1.45)	(1.49)
August 2001	(1.39)	(1.15)
September 2001	(2.00)	(1.56)
October 2001	(2.45)	(2.26)
November 2001	(2.05)	(1.77)
December 2001	(1.31)	(0.66)
January 2002	(0.58)	0.33
February 2002	0.07	1.22
March 2002	0.78	2.13
April 2002	1.34	2.59
May 2002		2.87

[1]The confirmed GLI represents 100% of the series, while the provisional accounts for about 75%.