



PMI™
By IHS Markit

An introduction to the PMI surveys

July 18, 2017

| | |
|-------------------------------------------------|----|
| Introduction | 3 |
| Methodology | 4 |
| What IHS Markit do and why we do it | 4 |
| Creating IHS Markit PMI Data | 5 |
| Panel building | 6 |
| Data Collection | 6 |
| Data Calculation | 7 |
| Seasonal adjustment | 7 |
| Coverage: Nation | 8 |
| Coverage: Sector | 9 |
| Coverage: Survey Indices | 11 |
| Coverage: Survey Indices – Headline Indices | 13 |
| Coverage: Survey Indices – Flash PMI Indices | 14 |

Introduction

Welcome to the **IHS Markit PMI™** data, compiled by IHS Markit. The following document provides a simple single source overview of IHS Markit, the IHS Markit PMI survey methodology and the data produced.

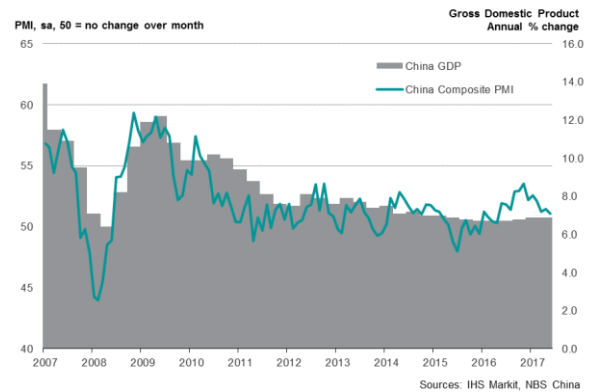
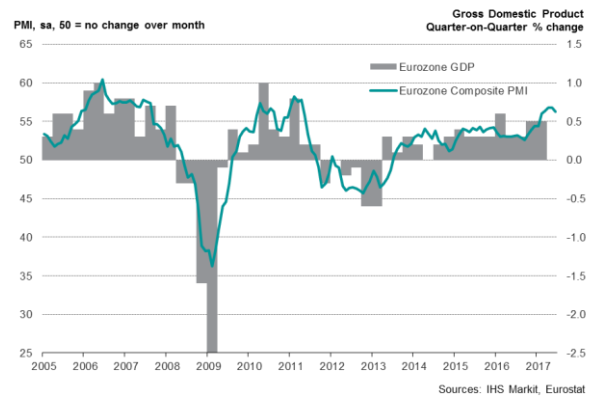
IHS Markit is a global provider of some of the world's most influential business surveys, one example being the PMI.

Our indicators are closely watched by the financial markets and help shape economic policy, by providing some of the earliest signals of economic performance.

The surveys form a key source of business intelligence for participants operating in the 'real' economy. Our data are presented in a clear, jargon-free format, allowing a swift understanding of current economic trends.

Purchasing Managers' Index™ (PMI™) series are monthly economic surveys of carefully selected companies. They provide an advance signal of what is really happening in the private sector economy, by tracking variables such as output, new orders, employment and prices across key sectors.

Before outlining the PMI methodology in greater detail, take a look at the charts to the right showing examples of the close relationship between the PMI survey indicators and official economic data. The PMI data – which are published earlier than the official data – clearly identify the turning points in the business cycle and closely track the rate of change in key economic variables such as gross domestic product (GDP). This proven track record is one of the many reasons why the PMI is so closely monitored.



Methodology

What IHS Markit do and why we do it

The PMI methodology was developed to resolve issues caused by the following deficiencies and weaknesses in many official economic indicators:

- Inconsistent methodologies between nations and regions, making like-for-like comparisons between nations or regions difficult
- Infrequent releases and delays in publication
- Difficulties in providing coverage for the whole economy
- Frequent and ongoing revisions

These problems mean decisions are often made on the basis of data that subsequently change, providing the potential for policy and investment allocation errors.

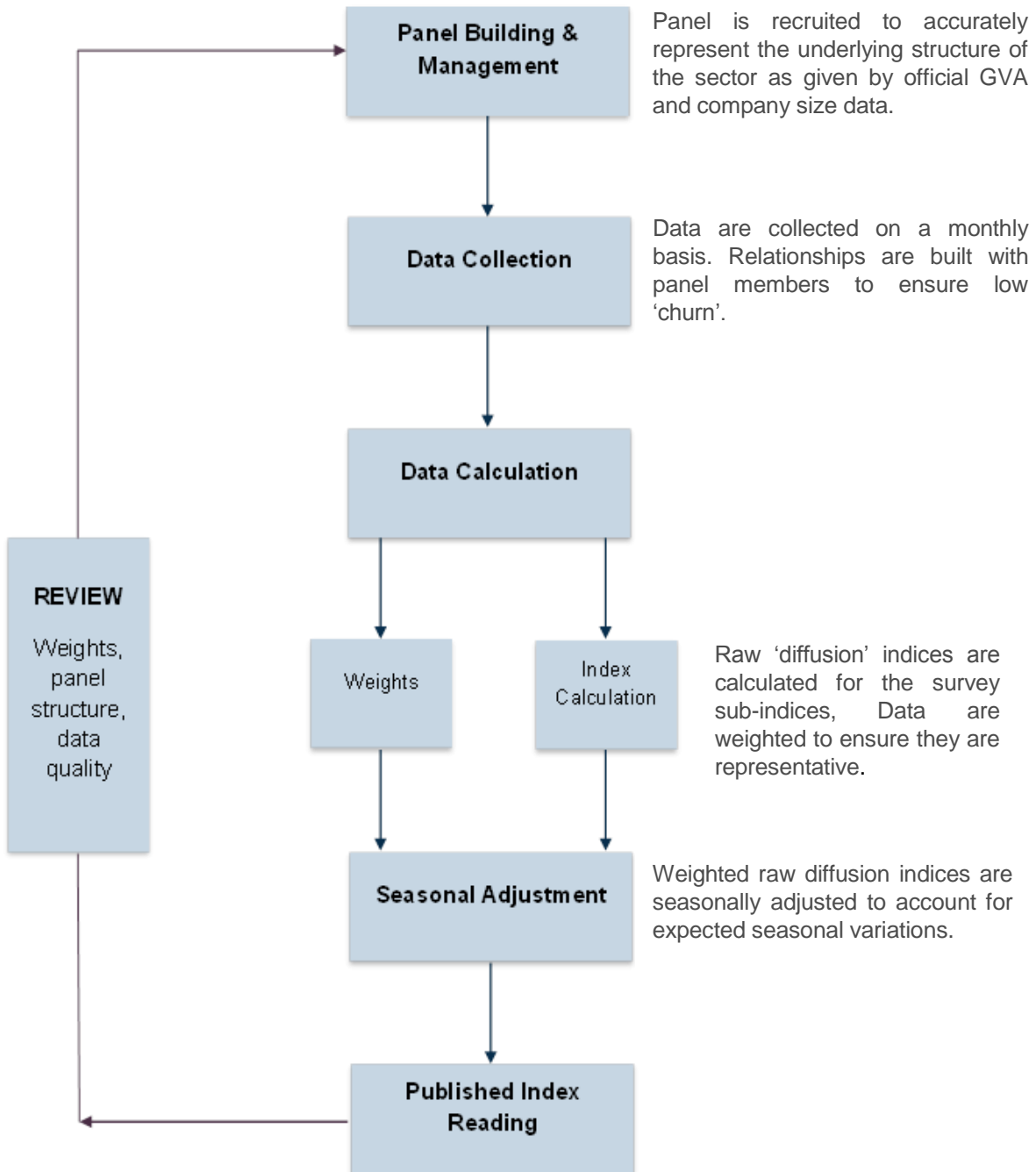
The PMI methodology allows for rapid collection, processing, analysis and publication of data, providing a timely, accurate, reliable and internationally consistent series of global economic indicators.

There are four key elements to the methodology:

1. Standard questionnaire asked to key decision makers
 - Companies asked questions covering output, demand, prices, employment
 - Providing 'grass roots' level perspective on actual economic trends
 - Designed to produce timely information ahead of official data
2. Responses are provided simply on the basis if levels are higher, the same or lower than in the prior month
 - Allows rapid and accurate data collection
 - Quantitative responses ensure hard economic data...based on fact NOT opinions
3. Data are collected from structured panels, recruited and managed to ensure accurate representation of underlying economic structure
 - Resulting indices are also weighted to further ensure accuracy and representation
4. Underlying survey responses included in the indices are not revised after first publication

Creating IHS Markit PMI Data

The methodology for creating IHS Markit PMI data flows through a number of stages, starting from the initial building of the panel, through data collection and calculation and then the final publication of the latest readings. The following diagram outlines the process.



Panel building

Structural economic indicators obtained from national statistics offices are used to construct a recruitment matrix by company size and sector contributions to overall sectorial gross value added (GVA). This matrix is then used to target recruitment of a representative sample of companies for the survey. The building of the panel may be undertaken either by an in-house panel manager at IHS Markit or by a country local agency.

An example of a recruitment matrix is shown below:

| ISIC Service Sector Classification | 1-19 Employees | 20-249 Employees | 250+ Employees | Sector (%) |
|----------------------------------------|----------------|------------------|----------------|------------|
| Hotels & Restaurants | 9 | 7 | 3 | 4 |
| Transport & Storage | 8 | 15 | 18 | 8 |
| Post & Telecommunications | 0 | 25 | 0 | 5 |
| Financial Intermediation | 12 | 14 | 17 | 8 |
| Renting & Business Activity | 98 | 108 | 87 | 58 |
| Other Services | 24 | 28 | 34 | 17 |
| Total | 151 | 197 | 163 | 100 |

*Please note actual targets are more detailed by sector than illustrated

(return to section [Data Calculation](#))

Data Collection

Data are collected either by an in-house panel manager at IHS Markit or by a country local agency. Companies are asked a standard sector-specific questionnaire on a monthly basis. Questions are of the form, using output as an example, of:

“Is the level of output at your unit (in volume terms) higher, the same or lower than one month ago”

Companies are also asked to provide reasons (freehand) for the response given.

Data are usually collected during the middle two weeks of the month, so companies are asked to compare mid-month to mid-month. All responses are input into IHS Markit Polling Engine database for data calculation and weighting purposes.

Details on the variables for which data are collected are included in section [Coverage: Survey Indices](#)

Data Calculation

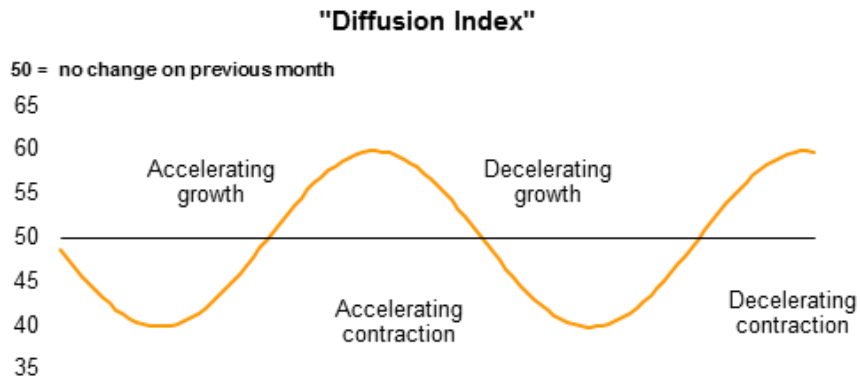
Individual company responses are weighted according to sector and company size contributions to overall sectorial gross value added based on the weighting matrix constructed in the same way as the [recruitment matrix](#) used when recruiting the panel. The weighting provides IHS Markit with the weighted proportions of companies responding up, the same and lower.

The latest values for the sub-indices are then calculated using the following formula:

$$\text{INDEX VALUE} = (\% \text{ 'up'}) + (0.5 * (\% \text{ 'the same'})) + (0.0 * (\% \text{ reporting 'down'}))$$

The resulting index values are therefore bounded between 0 (all companies respond lower) and 100 (all companies respond higher), with a theoretical no-change mark at 50 (all companies respond 'the same' or equal proportions respond up as do for down).

The resulting index is called a diffusion index, with values above 50.0 signaling expansion and below 50.0 indicating contraction. The distance from the 50 no-change mark signals the implied rate of change in the variable, the further from 50.0 the faster the rate of change indicated.



Note on interpreting the index

For example, take a movement in a PMI output sub-index from 55.0 in January to 52.5 in February. Although the level of the output index has fallen, it has nonetheless posted above 50.0 in both months. The correct interpretation is that the volume of output expanded in both January and February, but that the rate of increase was slower in February compared to January.

Seasonal adjustment

IHS Markit PMI sub-indices are seasonally adjusted using a combination of the Census Bureau X-12 ARIMA method and an in-house method developed by IHS Markit incorporating past adjustment factors and additional information on observed seasonality provided from panel members' responses.

Coverage: Sector

The following table outlines the manufacturing, services and whole economy surveys produced by IHS Markit (correct as of July 18 2017):

| Nation\Region | PMI | PMI | PMI | Outlook | Outlook | Outlook |
|------------------------|---------------|-----------|----------------------------------|---------------|--------------|--------------|
| | Manufacturing | Services | Whole Economy* or Composite** | Manufacturing | Services | Composite** |
| | (Monthly) | (Monthly) | (Monthly) | (Tri-annual) | (Tri-annual) | (Tri-annual) |
| Global | Y | Y | Y** | Y | Y | Y** |
| European Union | Y | Y | Y** | Y | Y | Y** |
| Eurozone | Y | Y | Y** | Y | Y | Y** |
| Germany | Y | Y | Y** | Y | Y | Y** |
| France | Y | Y | Y** | Y | Y | Y** |
| Italy | Y | Y | Y** | Y | Y | Y** |
| Spain | Y | Y | Y** | Y | Y | Y** |
| Netherlands | Y | – | – | Y | – | – |
| Austria | Y | – | – | Y | – | – |
| Ireland | Y | Y | Y** | Y | Y | Y** |
| Greece | Y | – | – | Y | – | – |
| Non-Eurozone EU | | | | | | |
| United Kingdom | Y | Y | Y** | Y | Y | Y** |
| Czech Republic | Y | – | – | Y | – | – |
| Poland | Y | – | – | Y | – | – |
| Americas | | | | | | |
| USA | Y | Y | Y** | Y | Y | Y** |
| Canada | Y | – | – | – | – | – |
| Mexico | Y | – | – | – | – | – |
| Brazil | Y | Y | Y** | Y | Y | Y** |
| Asia | | | | | | |
| China | Y | Y | Y** | Y | Y | Y** |
| Japan | Y | Y | Y** | Y | Y | Y** |
| India | Y | Y | Y** | Y | Y | Y** |
| South Korea | Y | – | – | – | – | – |
| Indonesia | Y | – | – | – | – | – |
| Taiwan | Y | – | – | – | – | – |
| Vietnam | Y | – | – | – | – | – |
| Malaysia | Y | – | – | – | – | – |
| Myanmar | Y | – | – | – | – | – |
| Thailand | Y | – | – | – | – | – |
| Philippines | Y | – | – | – | – | – |
| Singapore | – | – | Y* | – | – | – |
| Hong Kong | – | – | Y* | – | – | – |

Middle East and Africa

| | | | | | | |
|---------------------|---|---|----|---|---|---|
| Egypt | - | - | Y* | - | - | - |
| Saudi Arabia | - | - | Y* | - | - | - |
| UAE | - | - | Y* | - | - | - |
| South Africa | - | - | Y* | - | - | - |
| Lebanon | - | - | Y* | - | - | - |
| Uganda | - | - | Y* | - | - | - |
| Zambia | - | - | Y* | - | - | - |
| Nigeria | - | - | Y* | - | - | - |
| Kenya | - | - | Y* | - | - | - |

Other

| | | | | | | |
|------------------|---|---|-----|---|---|-----|
| Australia | Y | Y | Y** | - | - | - |
| Russia | Y | Y | Y** | Y | Y | Y** |
| Turkey | Y | - | - | - | - | - |

Survey coverage continued:

In addition to the manufacturing and service sector PMI surveys, IHS Markit also conducts surveys for construction (UK, Germany, France, Italy and Republic of Ireland), retail (Germany, France and Italy) and jobs (UK) in a number of nations.

Coverage: Survey Indices

The list of indices available for the manufacturing and service sector surveys is shown below. Reading across the columns of each row of the table shows the comparable index types for each sector and which indices for manufacturing and services are weighted together to calculate the composite readings.

For example, the Manufacturing Output Index is the direct equivalent of the Services Business Activity Index and these two indices are weighted together to calculate the Composite Output Index. (Return to section Data Collection for more information on the weighting process).

The headline index from each survey type is shown in bold text.

Important clarification: The headline Composite Output Index is a weighted average of the headline Services Business Activity Index and the Manufacturing Output Index. The headline Manufacturing PMI is NOT used in the calculation of the Composite Output Index.

| Manufacturing | Services | Composite (manufacturing and services) |
|----------------------------------------|----------------------|-------------------------------------------------------|
| Output | Business Activity | Output |
| New Orders | New Business | New Orders |
| Employment | Employment | Employment |
| Input Prices | Input Costs | Input prices |
| Output Prices | Output Prices | Output Prices |
| Backlogs of Work | Outstanding Business | Backlogs of Work |
| Future Activity | Future Activity | Future Activity |
| Suppliers' Delivery Times | | |
| Quantity of Purchases | | |
| Stocks of Purchases | | |
| Stocks of Finished Goods | | |
| New Export Orders | | |
| Purchasing Managers' Index* | | |

The table below outlines the index coverage for the whole economy, construction and retail surveys:

| Whole Economy | Construction | Retail |
|------------------------------------|------------------------------|----------------------------------|
| Output | Total Industry Activity | Actual Sales (vs. one month ago) |
| New Orders | New Orders | |
| Employment | Employment | Employment |
| Overall Input Prices | Input Prices | Average Prices Paid |
| Output Prices | | |
| Backlogs of Work | | |
| New Export Orders | | |
| Quantity of Purchases | Quantity of Purchases | Value of Goods For Resale |
| Stocks of Purchases | | Stocks of Goods For Resale |
| Suppliers' Delivery Times | Suppliers' Delivery Times | |
| Purchase Prices | | |
| Staff Costs | | |
| | Future Activity | |
| Purchasing Managers' Index* | | |
| | Housing Activity | |
| | Commercial Activity | |
| | Civil Engineering Activity | |
| | Sub-contractor Use | |
| | Sub-contractor Availability | |
| | Sub-contractor Quality | |
| | Sub-contractor Rates Charged | |
| | | Actual Sales (vs. one year ago) |
| | | Actual Sales vs. Plans |
| | | Expected Sales vs. Plans |
| | | Gross Margins |

Coverage: Survey Indices – Headline Indices

For each survey type (manufacturing, services, whole economy, construction and retail), IHS Markit have defined a concept called the headline index. A headline index is the seasonally adjusted index within that survey which is most closely watched by the markets. The value of the headline index, unlike the values of other sub-indices, will appear on the press releases published by IHS Markit.

| Survey Type | Headline Index |
|----------------------|--------------------------------------|
| Manufacturing | Purchasing Managers' Index™ (PMI™) |
| Services | Business Activity Index |
| Whole Economy | Purchasing Managers' Index™ (PMI™) |
| Construction | Total Industry Activity Index |
| Retail | Actual Sales vs. One Month Ago Index |

For **services**, **construction** and **retail**, the headline index is therefore based on a single question asking if levels activity (or, in the case of retail, sales) are higher, the same or lower than in the previous month.

For **manufacturing** and **whole economy** surveys, a separate derived index is assigned headline status. This index is called the Purchasing Managers' Index™ (PMI™) and is calculated as a weighted average of the following sub-indices:

| Survey Type | Headline Index |
|-----------------------------------|--------------------|
| New Orders | 30% weight applied |
| Output | 25% weight applied |
| Employment | 20% weight applied |
| Suppliers' Delivery Times* | 15% weight applied |
| Stocks of Purchases | 10% weight applied |

* The Suppliers' Delivery Times Index (SDTi) is inverted, i.e. $100 - \text{SDTi}$, when included in the headline PMI

Coverage: Survey Indices – Flash PMI Indices

For certain nations and sectors, IHS Markit also produce a “flash” estimate approximately one week before final results are published. The flash estimate is calculated in exactly the same way as the final published data, except the sample is an early cut of the data comprising only 80%-85% of the final sample.