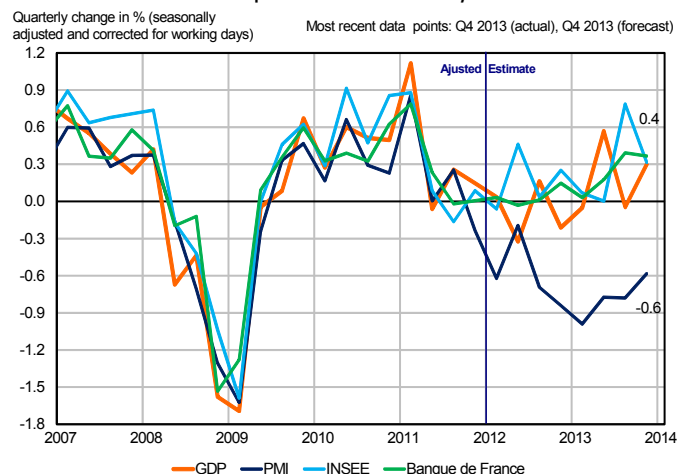


## Are business surveys equally successful to forecast economic activity in France?

- As the first available economic indicators, business surveys are at the core of short term economic forecasting. However, since mid-2012, business climate indices and composite indicators, which summarize answers given to survey's various questions (about past activity, further prospects, employment etc.), did not move in concert with French growth. Indeed, while French GDP has been quite resilient, business confidence indices from the official statistics office Insee and the Banque de France remain at a low level and the PMI index moves in an area corresponding to a contraction of economic activity.
- However, France seems to be an exception: in others euro area economies for which Markit also provides activity composite indicators, no marked discrepancy between economic activity and composite indicators was found.
- For France, this issue of a clear dropout between indicators and current economy is weaker when using detailed figures of surveys. Thus, forecasts based on detailed figures of Insee or Banque de France surveys still succeed in assessing economic growth, while those based on PMI indices currently seem irrelevant (see chart below).
- Better performance of INSEE and Banque de France surveys to provide short term forecasts could be linked with the sample size of the survey: while Insee or Banque de France questions about 10 000 firms, the PMI's sample is ten times smaller.

Divergences between quarterly GDP forecasts according to detailed balances of the INSEE, Banque de France and PMI surveys



Sources: INSEE, Banque de France, Markit, DG Trésor calculations.

## 1. Headline indicators from business surveys have failed to forecast business activity trends reliably since 2012 in France

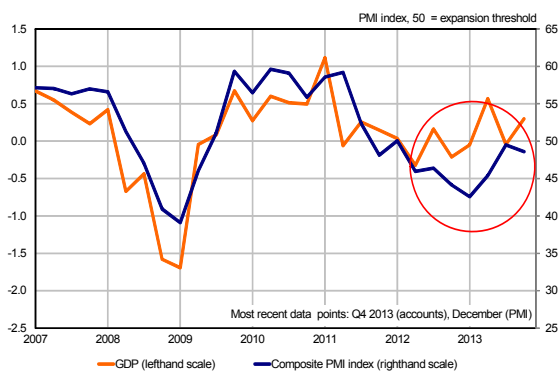
### 1.1 All of the composite indicators are struggling to report trends in business activity in France reliably

The INSEE and Banque de France business climate indicators, along with the composite PMI index<sup>1</sup>, appear to have reported trends in the French economy reliably (see Charts 1) until the second quarter of 2012. The PMI index even seems to have performed slightly better than the INSEE surveys in pronounced downturns, the INSEE

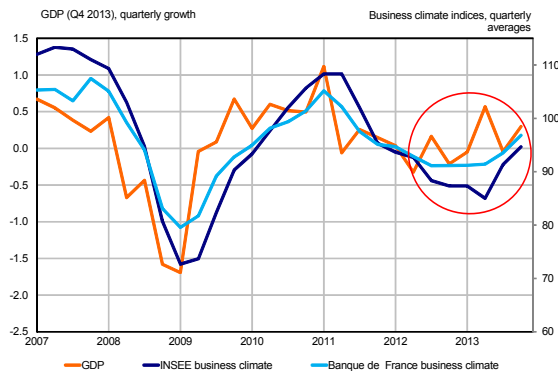
surveys tending to smooth trends more because they are conducted on a rolling three-month basis.

There has been a decoupling since summer 2012, however: whereas France's GDP held up quite well, the PMI remained constantly in a zone supposed to reflect a contraction of activity. Yet this was not the only index to have failed to capture French growth for a number of quarters now (see Charts 1), the same being true for INSEE and Banque de France business climate surveys.

**Chart 1: All business surveys for France are now out of phase**  
France: GDP and the Markit PMI composite output index



France: GDP and business climate measured by INSEE and Banque de France

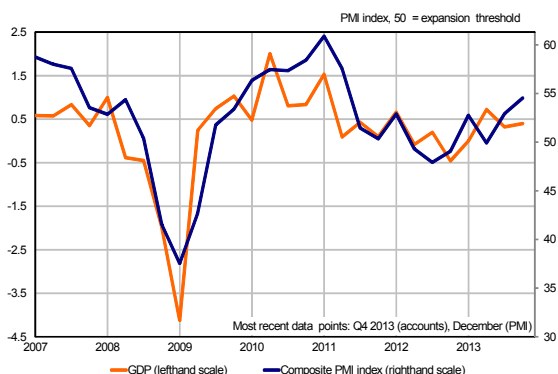


### 1.2 The PMI composite indices are still reliable for the other European countries, apparently

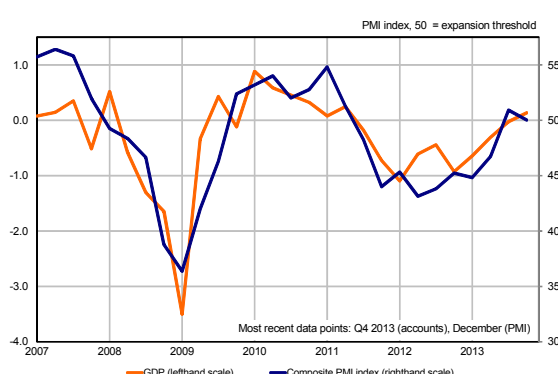
PMI indices are available for a number of economies and are highly useful to economists in making international comparisons.

However, this property has lost some of its force, insofar as France alone, among the eurozone economies for which Markit calculates these indicators, is affected by this decoupling between actual activity and PMI indices (see Charts 2).

**Chart 2: Only the French PMI indices have consistently failed to capture GDP growth for more than a year**  
Germany: GDP and the Markit composite output index



Italy: GDP and the Markit composite output index



(1) The PMI indices are compiled by Markit on the basis of surveys of purchasing managers in the manufacturing industry and service sectors. A composite index is compiled from the weighted average of results for the recent activity of both sectors.

## 2. Analyses of French business conditions are thus less reliable when based on PMI surveys

### 2.1 PMI indices have the requisite properties for use in forecasting models...

Markit's qualitative survey supplies detailed balances, which are supposed to shed light on the direction of change in activity. They are among the first cyclical indicators to be published each month for France (the "flash" version covering 85% of the panel is available as early as the third week of the month surveyed). They are therefore available within the same time frame as INSEE's business surveys, and around two weeks before those published by the Banque de France. Economists concerned with the business cycle and financial markets analysts therefore scrutinise them very closely.

Moreover, these surveys provide sufficiently long series (fourteen years) to permit quarterly forecasts of GDP by "calibration"<sup>2</sup> (for France, for example, PMI indices describing activity in manufacturing and market services have been available since the second quarter of 1998). They are therefore credible alternatives to INSEE's business surveys (which have been available since 1976 for industry) or to Banque de France business surveys (available since 1989).

As with the other business surveys, several models ("calibrations") based on the various balances of PMI surveys were developed in 2011 in order to forecast GDP trends. A classic automated procedure was used in order to maximise correlations between the variable explained and the various components of the PMI surveys, keeping only those with the greatest predictive power for the time frame considered (see Box 1).

### 2.2 ... so why have they been less reliable in forecasting French growth for nearly two years now?...

Over the estimation period, to end-2011, the calibrations based on the PMI survey appear to be at least as reliable as those based on the INSEE surveys for the purposes of forecasting GDP growth<sup>3</sup>. On the other hand, since mid-2012, although the INSEE and Banque de France composite indices too are failing to capture France's resilient growth, the calibrations based on these surveys better reflect growth trends than those based on the PMI indices.

By way of illustration, calibrations based respectively on PMI indices, INSEE surveys and Banque de France surveys for the purposes of forecasting GDP growth in the current quarter (at the end of the second month in the quarter)

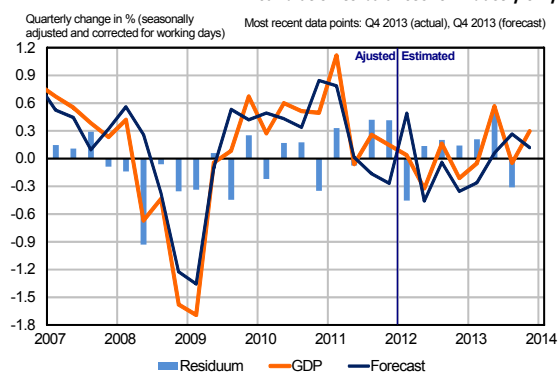
are shown in the chart on page 1 (see above)<sup>4</sup>. Calibrations based on the PMI have systematically under-estimated growth trends significantly since mid-2012.

We now have sufficient depth of field to be able to consider that these tools have been erring on the side of pessimism over the recent period, despite performing well over the estimation period.

Balances concerning services are the largest contributors to the under-estimation of growth in the calibrations based on PMI indices. Alternative models have been devised using the same procedure as previously, but confined purely to the balances for industry. It should be noted, however, that by thus restricting the dataset used to build the model, the models developed are less accurate for periods prior to 2012.

Moreover, even if they supply better forecasts than the initial PMI-based model, these alternative models are not entirely satisfactory insofar as they still tend to under-estimate activity for the recent period (see Chart 3).

Chart 3: Q4 2013 GDP forecast at end-November by limiting PMI calibration to balances for industry only



Sources: INSEE, Markit, DG Trésor calculations.

Overall, while less incomplete models are now available for the period not included in the estimation, these could not have emerged from an agnostic application of the models selection procedure described below (see Box 1) at the time they were devised, a few years ago. That is because these new models result from the recent decision to reduce the amount of usable information, in view of the persistent decoupling of PMI-based tools and a study of trends in the various detailed balances over the past two years.

(2) This is the name given to models that seek to establish a direct linkage between growth trends and the balances of opinion of business confidence surveys (see Box 1 below for further details of calibration methods used).

(3) Within the meaning of the RMSFE, which measures root mean square forecasting error.

(4) Calibrations based on the PMI indices, which were used until the end of 2011, have simply been re-estimated with the annual accounts in May 2013, for the sake of comparability.

### Box 1: Calibrating survey data in order to forecast growth rates

Beyond directly comparing GDP trends with composite indicators of activity or business sentiment as measured by the different surveys, by means of classic calibration techniques, we can go further in using survey balances to forecast GDP growth rates. This entails combining a greater quantity of survey data in order to establish forecasting models.

These models embrace a large number of balances, as well as changes (3-month average, monthly or quarterly difference), and lagging indices may also be meaningful in explaining quarter-to-quarter GDP trends. That is because, while some of the questions asked pertain directly to the month under review (trends in output or in service sector activity, for example), others concern activity trends in the months ahead (new orders booked, business outlook in the medium- to long-term). We may therefore consider that certain changes in balances can also supply useful information to account for very short-term GDP trends.

Overall, potentially a very large number of indices can be used to forecast GDP growth, and an empirical, automatic procedure for the selection of variables is therefore needed in order to determine which models are relevant for each time frame.

This procedure consists, in the first place, in identifying, from among all available variables (indices and their changes), the one most closely correlated with the quarterly variations in GDP for the quarter under consideration. A model using only this item of information is then estimated, from which a first residuum is extracted. Among the other available variables, we then look for the one most closely correlated with this residuum, and then we re-estimate a new "augmented" model incorporating the two variables selected previously. We then re-test the correlation with the remaining variables of the resulting residuum from the new model.

The stop criterion corresponds to the point at which none of the remaining variables potentially entering into the calibration contributes information to the model.

This method does not preclude a critical assessment (an "independent expert's" assessment). Thus, at each stage, the signs associated with the coefficients of the variables used are evaluated, and the corresponding variable is kept in the procedure if the sign of the coefficient associated with it in the equation is deemed consistent with the wording of the question asked. A variable considered irrelevant is discarded and eliminated from the procedure.

Finally, for the purpose of estimating the models, only quarterly GDP growth rates regarded as final<sup>a</sup> are selected (i.e. up until Q4 2011 according to the most recent published version of the base 2005 quarterly national accounts). Within this framework, because they are subject to review, GDP variations for 2012 (semi-provisional annual accounts) and 2013 (provisional quarterly accounts not fully fitted to the annual accounts) are not used for the purpose of adjusting the models.

In more detailed terms, the different models generally estimated are:

- Model 1: a forecasting model for the quarter elapsed is constructed based on the indices available up until the 1<sup>st</sup> month of the reference quarter; logically, the balances for past activity ought to account for the majority of balances within this model;
- Model 2: a forecasting model for the current quarter is constructed based on indices available up until the 1<sup>st</sup> month of the reference quarter;
- Model 3: a forecasting model for the current quarter is constructed based on indices available up until the 2<sup>nd</sup> month of the reference quarter;
- Model 4: a forecasting model for the current quarter is constructed based on PMI indices available up until the 3<sup>rd</sup> month of the reference quarter;
- Model 5: a forecasting model for the forthcoming quarter is constructed based on indices available up till the 3<sup>rd</sup> month of the reference quarter; in these models, logically the more forward-looking balances (e.g. the outlook for business activity) ought to be selected.

It should be noted that the procedure for developing the calibrations does not guarantee the accuracy of forecasting models outside the estimation period. While it is possible to compare various indicators of forecasting accuracy for a given period, we do not recommend selecting a model, even if it is optimal in terms of its accuracy for the recent period, given the possibility of subsequent revisions to the variable forecast in it.

a. It is also possible to use the series of initial results for the purpose of specifically forecasting the first estimation of the growth rate published by INSEE.

### 2.3 ... and qualitative commentary on these indices probably also requires caution

Leaving aside the current decoupling of PMI-based forecasts, the qualitative commentary on PMI index levels requires caution. According to Markit, for both the composite indicator and the sector-specific (industry or

services) indicators, the historically based thresholds of 50 represent the point at which activity is flat. However, recent trends in France have shown how far this interpretation is off-target, even if estimations for the past period leave the level of this threshold unaffected (see Box 2), except at the sector level.

#### Box 2: Interpreting thresholds for the PMI indices

According to Markit, the 50 threshold ought for the most part to correspond to stable activity, both for the composite index and for individual sectors. This threshold's legitimacy has been questionable for France in recent quarters, however, insofar as the composite PMI index is currently below 50 even though GDP is holding up relatively well. The same observation can be made for individual sectors. The PMI "recent output" indicator for industry has been below 50 since Q3 2011 even though manufacturing output has held up relatively well. The decoupling in the service sector is more pronounced, insofar as output has barely declined.

Estimation of these thresholds for France by means of a regression model linking the GDP growth rate and the level of the PMI over the period Q1 1999-Q4 2011 shows that, in the past, a composite PMI index above 50 does indeed indicate an expanding GDP.

$$\Delta Y_t = \alpha(PMI_t - threshold)$$

$\Delta Y$ : quarterly GDP or output growth rate;

$PMI$ : quarterly average composite or sector-specific PMI index.

Concerning individual sectors, the threshold appears to be significantly above 50 for manufacturing output (53) and service output (51.4). These results suggest that one ought not to compare sector activity indices at the 50 threshold.

The persistent decline in all of these indices since the end of 2011 is no longer consistent with the way in which activity and output have held up in the manufacturing and service sectors.

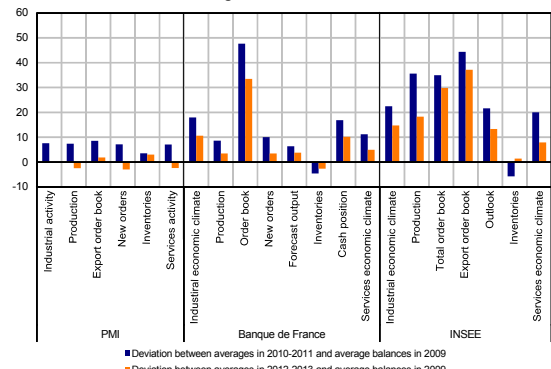
### 3. Explaining the decoupling between economic activity and PMI-based forecasts

#### 3.1 The size of the panel could account for the recent under-performance of PMI indices

The under-performance of PMI indices is not specific to the headline index, since the detailed balances in both industry and services appear to be skewed as well, in general. By way of illustration, they were practically as weak in 2012-2013 as they were in 2009 (see Chart 4). In the INSEE and Banque de France surveys, on the other hand, detailed balances for the past two years have suggested that activity is significantly less weak than during the crisis (almost all of the orange bars in Chart 4 are significantly positive).

This could be the result of differences in the size of the panels. Thus the panel tracked by Market to build its PMI indices is ten times smaller than those used by INSEE and the Banque de France in their surveys (900 companies, versus around 9,000).

Chart 4: Average detailed balances between 2009 and 2013



Source: INSEE, Banque de France, Markit, DG Trésor calculations.

With their smaller panel, the PMI indices could have difficulty representing the heterogeneity of the different sectors. The INSEE surveys could better represent the variety of activities in the service sector than the PMI indices. Indeed, the former covers the entire service sector, with the exception of government administration and financial services.

For example, they include administrative and support services, the activities of non-profit organisations, and property activities. These activities, representing nearly 15% of total value added, to a large extent correspond to

rental payments, which are pre-committed and are therefore highly inelastic to cyclical conditions, thereby serving to "smooth" economic activity.

### Box 3: Different panels according on the surveys

The PMI panel for France comprises 900 companies, made up of 400 industrial companies, 400 service companies, and 100 construction companies (according to Markit, this panel is comparable to the one for the other leading eurozone countries).

Table 1: Size of PMI survey panel

	Germany	France	Italy	Spain
Number of respondent	900	900	900	800
Manufacturing industry	400	400	400	400
Services	400	400	400	400
Construction	100	100	100	-

Source: Markit.

This panel takes into account the heterogeneity of company sizes. In the manufacturing sector, the split between small (less than 50 employees), medium-sized (up to 250 employees) and large (more than 250 employees) businesses is roughly 1/3 each. For services, small businesses are more heavily represented (roughly half), while medium-sized businesses account for around 30% and large companies around 20%.

In contrast, the size of the panels tracked by the Banque de France and INSEE is vastly greater, each covering around 9,000 companies. For instance, the monthly INSEE business surveys cover 4,500 service companies (and within these, practically the entire service "branch", with the exception of government administration and financial and insurance activities), and around 4,000 industrial companies. To these are added companies from other sectors such as construction companies (2,500 respondent companies). Altogether, the panel from which INSEE's business climate indicator is derived is extremely large and representative.

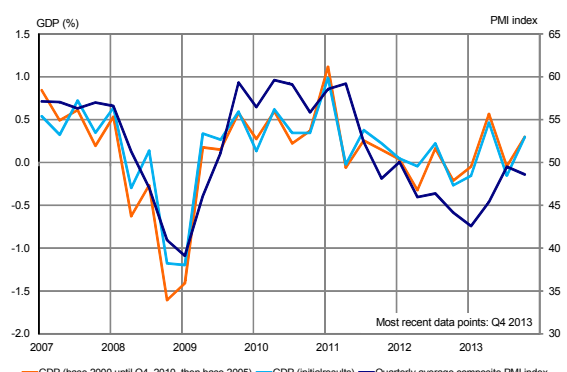
### 3.2 On the other hand, it seems unlikely that the decoupling heralds a significant revision to economic growth for the past two years

Markit recently stated that the decoupling between the PMI indicator and GDP trends could be significantly narrower on publication of the final national accounts<sup>5</sup>. The reasoning is based on the fact that the most recent final annual national accounts are those for 2010, whereas data for 2011 and 2012 are still provisional. According to

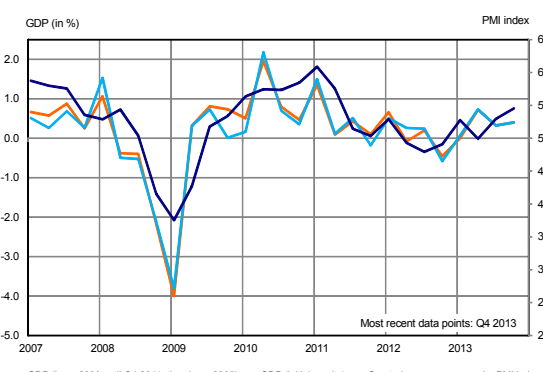
Markit, it is therefore possible that GDP has been overestimated, particularly for services, since these are hard to measure and subject to future revisions.

Past revisions (see Charts 5<sup>6</sup>) suggest that this scenario will not apply. In France, as in Germany<sup>7</sup>, revisions are limited and hardly ever change the sign of the variation in GDP.

Chart 5: GDP (initial results and final accounts) and composite PMI index  
France Germany



Sources: INSEE, Markit



Sources: Eurostat, Markit.

- (5) Markit Economic Research, 21 January 2014.
- (6) Revisions between initial results and final results are made on a consistent basis: for example, initial results are compared taking 2000 as the base year (respectively base year 2005) with the final results taking 2000 as the base year (respectively base year 2005).
- (7) The change of base year in Germany took place in August 2011.

While downside revisions did occur for France between 2007 and 2010, quarterly GDP growth was revised only very slightly (-0.1 percentage point) on average, and practically not at all over the entire observation period (between 2005 and 2010). More specifically, the largest revisions occurred during the crisis, but not afterwards

(2009-2010). Moreover, although the PMI indices were seriously overshooting between mid-2009 and end 2010, GDP was not revised upwards over this period. Future revisions are therefore unlikely to modify the conclusion that a decoupling has occurred.

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