

Two New Indicators to Help Analyse the Economic Outlook in France

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In France, the business tendency surveys conducted in the main economic sectors are essential components in diagnosing the economic outlook. Over the years, INSEE has gradually introduced two types of composite indicators for each business sector. Each of these types of indicator summarises in its own way the data contained in the many balances of opinion supplied by these surveys: there is a quantitative and coincident business climate indicator to measure the economic situation each month; and a more qualitative, leading turning point indicator with the purpose of signalling – as early as possible – the moment when economic cycles turn.

Indicators of this kind have been lacking, however, for the economy as a whole. This gap has now been filled, thanks to two new composite indicators based on the business surveys, and quantifying and qualifying the outlook for the entire French economy. These two new indicators – the business climate and turning point indicators for France – are the subject of this report.

The business climate indicator for France proves to be fairly close to the indicators for industry and services, although it does sometimes diverge from them. However, it is far less similar to the business climate indicator for the building industry, thereby giving the lie, somewhat, to the old saying that “when building goes, everything goes!” On the other hand, the France turning point indicator sends out signals that are quite similar to those of the building-sector turning point indicator, and even more so with regard to the turning point indicator for the wholesale trade.

Our French business climate and turning point indicators reproduce the economic cycles of the last thirty years in France quite faithfully. At present, they are indicating a deteriorating business climate and do not show any signs of there being a turning point in the short-term future, leading to an upswing in activity. Compared with the 1993 recession, the current downturn would appear to be slightly less profound, but longer-lasting. ■

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Previously, INSEE calculated composite indicators by sector...

To help analyse the outlook in the various sectors in the French economy, INSEE has built composite indicators over the last ten years or so, using data from its business surveys. Business climate indicators have been calculated in this way for industry (Doz and Lenglar, 1995), services (Cornec and Deperraz, 2006), and the building, retail and wholesale sectors (Notes de Conjoncture of June 2006, March 2007 and June 2008). Turning point indicators have also been developed for industry (Lenglar, 1997), then for building industry and wholesale trade (Notes de Conjoncture of March 2006 and 2008). Business climate indicators show the current situation and reflect the economic cycles in a given sector, while turning point indicators aim to detect, as early as possible, the moment when economic trends are reversed in that same sector.

... but not for the economy as a whole

This sort of tool did not exist for the French economy as a whole, all sectors included. In this report, we present two new indicators for France, a business climate indicator and a turning point indicator. They complete the set of existing indicators and will help diagnose business cycles in France.

I A new business climate indicator for France

The business climate indicator for France portrays the overall economic situation

A business climate indicator is a composite indicator which summarises information that is common to several sets of data, in this case the balances of opinion in business tendency surveys. This indicator is more easily legible than the balances considered separately and makes the survey results easier to interpret. It offers the advantage of being less volatile than the various survey balances of opinion. The composite indicator is interpreted as a measurement of the economic climate as perceived by businesses. It offers an insight into economic activity before the quarterly accounts have become available, and constitutes a priceless instrument in business situation diagnosis.

However, building a business climate indicator for the French economy as a whole brings its own specific problems. The five main INSEE business tendency surveys – in industry, services, building industry, wholesale and retail trade – have been available since different dates and at frequencies that have sometimes varied in recent years (see Table 1).

I.1 The business climate indicators envisaged

Different tested indicators according to the type and number of variables in the model

In order to obtain a monthly French business climate over a lengthy period, we used dynamic factor analysis and a Kalman filter estimation (see Annexe 3). This framework of analysis is perfectly suited to time series (autocorrelated variables) and to series of different frequencies or presenting changes in frequency. In particular, it is not necessary to assign values to the balances that are unavailable for a given month.

Table 1

Availability and frequency of surveys

	Industry	Services	Building industry	Wholesale Trade	Retail Trade
1977	M	NA	Q	NA	NA
1979				B	
1988		Q			
1991		M			
1993		M			
Since 2000		M			

How to read this Table: M(monthly), B(monthly), Q(quarterly), NA (Not available)

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Once the estimation method had been determined, the variables to be used in the model needed to be selected. To do this, there was no one choice that stood out from the rest. A first method could consist of producing an aggregation by sector, taking the sectoral business climates. An alternative could be to take the balances of opinion in the various surveys directly. In this case, the scope of possibilities is very wide as regards the balances to be used. We narrowed down this scope in two ways. First of all, certain balances (such as those relating to prices) were excluded because they present cycles which differ markedly from the overall business cycle. Secondly, in building the composite indicator, we made use of the expertise acquired when the sector indicators were built, and limited ourselves to the balances used in them. A first indicator was built with all of these 26 balances. Two other, lighter indicators were also built, restricting the number of balances of opinion to 12.

One indicator based on sectoral business climates, and three on survey variables

The final selection was thus made between four business climate indicators (CI):

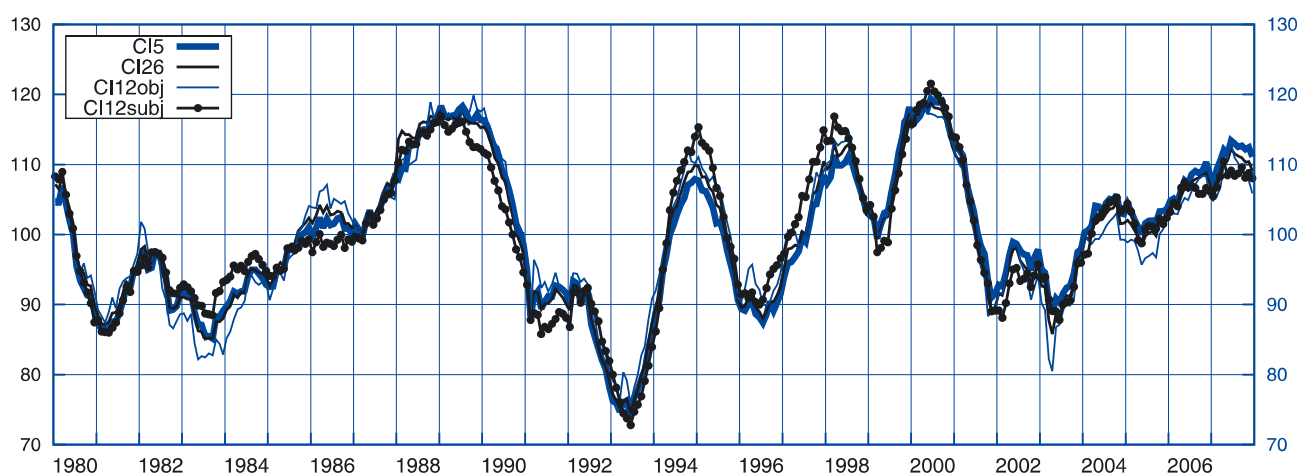
- one business climate indicator based on the 5 sector climates (CI5);
- one business climate indicator based on the 26 balances of opinion used in the sectoral business climate indicators (CI26, see Appendix 1 for the list of balances considered).

- one business climate indicator based on a first selection of 12 balances used in the different sectoral business climate indicators; the selection was made by dynamic factor analysis of the centred reduced balances, keeping those balances for which the associated loading was strictly above the median. This purely statistical (more 'objective') selection resulted in no balance from the construction sector being conserved (CI12obj, see Appendix 1 for the list of balances);

- another business climate indicator based on a second selection of 12 balances used in the sectoral climates (CI12subj); this selection was made more 'subjectively' by choosing the balances that were considered as being the main ones in each sector, according to the experts (see Appendix 1; among other things, the coefficients of the different balances in the composite indicator of the sector are compared).

The four resulting business climate indicators were generally very close to each other (see Chart 1). They did display some differences in certain periods, nonetheless.

1 - Comparison of dynamic business climate indicators



How to read this Chart: CI5 is the business climate indicator built from the five sectoral business climates; CI12obj (resp. CI12 subj) is the business climate indicator built from the 12 objectively selected balances (resp. subjectively); last, CI26 is the business climate indicator based on the 26 balances entering into the calculation of sectoral business climates (see Annexe 1 for the list of balances).

Source: INSEE

I.2 The indicators put to the test

The choice of the best business climate indicator was based on two criteria relating to their practical use:

The stability criterion results in the indicator based on sectoral climates being rejected

Criterion 1: real-time stability

The addition of a new point must not substantially modify the previous estimate of the indicator. In concrete terms, the four business climate indicators mentioned above were estimated for each month from January 1999 through to December 2004, over the longest possible period⁽¹⁾, and then these 72 real-time estimates⁽²⁾ were compared (see charts in Appendix 2 and Table 2):

- on the one hand by considering the mean over the 1980 - 1998 period of the maximum revisions of each month (revision 'over the common period'): for a given month *m*, the maximum revision was calculated as the difference between the highest value and the lowest value of the estimates made between January 1999 and December 2004;

- on the other hand by calculating the mean absolute revision 'at one and two months', i.e. for a given month *m* (*m* posterior to December 1998), the difference in absolute value between the first estimate of the business climate indicator and the second and third estimates of the business climate indicator, respectively one and two months later.

This exercise (see Table 2) resulted in outright rejection of the composite indicator built using sector factors (CI5), as it was clearly unstable compared with the others. It also resulted in rejection of the indicator built from the 12 balances chosen 'manually' (CI12 subj), even though it was distinctly less unstable. According to this criterion, however, indicators CI26 and CI12obj offered virtually equivalent performances, with CI12obj appearing to be very slightly better.

The ability to forecast GDP is a less discriminating criterion

Criterion 2: GDP growth rate forecast

Since the purpose of business climate indicators is to characterise the economic situation, they are expected to provide a good forecast of short-term economic growth. To validate the choice of indicator, calibrations of the quarterly GDP growth rates over the 1992-2005 period were estimated, and their accuracy over that period was then compared.

(1) The indicator is available from January 1980 to January 1999 for the first estimate, January 1980 to February 1999 for the second, etc.

(2) Subject to any revisions of the survey balances of opinion, which are generally limited in size. In the case of CI5, each sector factor was first estimated in real time, as was the composite indicator built from these factors: it is therefore the business climate indicator as it would have been estimated at each date.

Table 2

Stability over time of the different business indicators

		CI5	CI26	CI12obj	CI12subj
Mean absolute revision	at 1 month	2.44	0.08	0.07	0.69
	at 2 months	2.36	0.11	0.09	0.69
over the common period		6.92	1.17	0.93	1.83

How to read this Table: CI5: business climate indicator built from the 5 sectoral business climates; CI12obj (resp. CI12 subj): business climate indicator built from the 12 objectively selected balances (resp. subjectively); CI26: business climate indicator based on the 26 balances used in the calculation of sectoral business climates.

The data are in index points, given that the factors are standardized with a mean of 100 and standard deviation of 10 (over the period 1980 - 1998). The business climate indicator built from the sectoral climate indicators (CI5) was revised on average by 2.4 points between the first estimate at the end of given month *m* and the second estimate at the end of month *m* + 1. The revision was of the same order of magnitude between the first estimate and the third estimate. The maximum revision (highest estimate - lowest estimate of the climate of a given month *m*) was almost 7 points on average (i.e. less than one standard deviation).

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These calibrations were obtained using the automatic variable selection algorithm in the Grocer toolbox for Scilab ⁽³⁾. The selected framework was that used in the INSEE Notes de Conjoncture, i.e. positioning ourselves in the second month of a quarter in order to produce a forecast of the current quarter (nowcast). The models selected were specified identically for all the indicators. The explanatory variables were always: a constant; the GDP value of the next-to-last known quarter (called the first time lag of GDP) with a negative coefficient, which plays the role of a restoring force; the composite level indicator; and the last two monthly variations of the indicator ⁽⁴⁾. Irrespective of the indicator, the coefficients associated with these three variables were positive, in line with expectations. In addition, all the regressions passed the usual specification tests successfully.

The calibrations that provided the best performances were those based on CI5, CI26 and CI12subj (see Table 3), and their performances were very similar, while CI12obj lagged behind them. Last, compared with other indicators such as the France Purchasing Managers' Index or the European Commission's France ESI (Economic Sentiment Indicator), these three indicators offered better predictive qualities ⁽⁵⁾ (see Table 4).

1.3 The business climate indicator for France finally selected

The selected indicator was the one estimated using all the survey variables

Based on our two choice criteria, we selected the composite indicator built with the 26 balances used in the sectoral business climates (see Chart 2). This was the one that achieved the best compromise between stability and ability to forecast GDP growth: it was barely less stable than the most stable indicator, namely the one built via the objective selection of 12 balances of sectoral composite indicators, and it was far superior in terms of predictive quality. On this criterion, it

(3) <http://dubois.ensae.net/grocer.html>

(4) However, we note that for the calibration using CI12obj, the first time lag of GDP is not significant at the usual thresholds. If this variable is removed, a very simple model is retained with the last known level indicator and only one monthly variation of the indicator. The specification common to the other indicators is therefore retained, as the performances of the two models are very similar.

(5) It should be noted that the models based on the European or PMI indicators are simpler, as they only involve, as well as the constant and the first time lag of GDP, the level indicator (for PMI) and the level indicator and first difference (for ESI).

Table 3

Predictive qualities of the different business climate indicators

	IC5	IC26	IC12obj	IC12subj
R ² adjusted	0,64	0,62	0,55	0,66
Durbin-Watson	2,20	2,24	2,21	1,96
RMSE	0,25	0,25	0,28	0,24

Estimation period: 1992-2005

Table 4

Predictive qualities of CI12subj and rival indicators

	ESI	PMI	IC12subj
R ² adjusted	0,49	0,52	0,63
Durbin-Watson	2,13	1,87	2,32
RMSE	0,27	0,26	0,22

Estimation period: 1992-2005 (shorter period owing to the unavailability of PMI indices prior to that date)

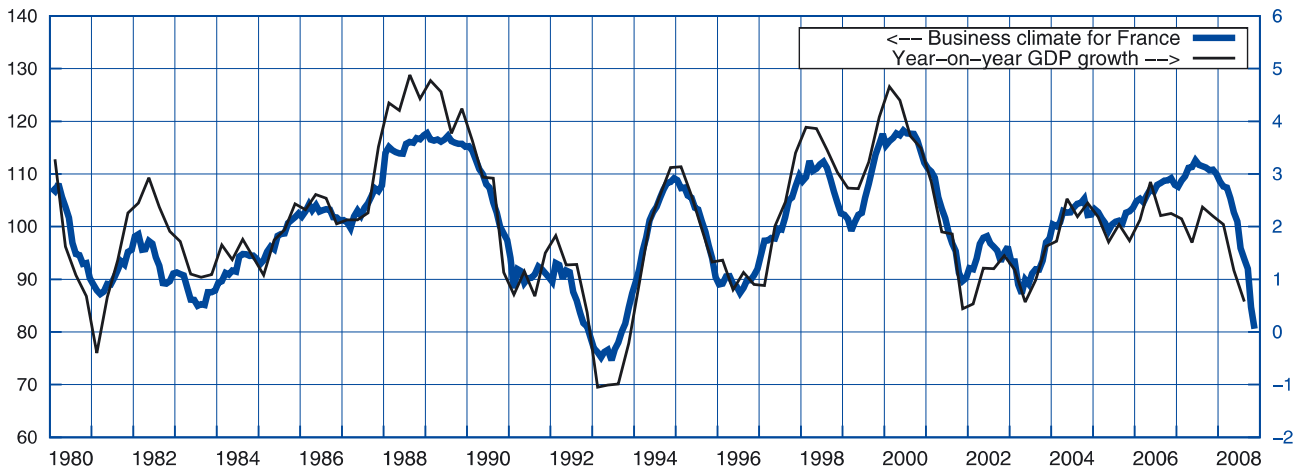
How to read these Tables: CI5: business climate indicator built from the 5 sectoral business climates; CI12obj (resp. CI12 subj): business climate indicator built from the 12 objectively selected balances (resp. subjectively); CI26: business climate indicator based on the 26 balances used in the calculation of sectoral business climates.

Durbin-Watson: statistic from the Durbin-Watson test which was used to ensure the non-correlation of residuals (the value must be close to 2 for the non-correlation hypothesis to be accepted). RMSE: root mean square error

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was only slightly less efficient than the indicator built from the subjective selection of the 12 most representative balances of surveys; while this latter indicator was much less stable.

2 - The new business climate indicator for France



Source: INSEE

II A new turning point indicator for France

The purpose of the turning point indicator is to detect any trend changes as early as possible

Alongside business climate indicators, designed to track the economic situation at any moment in time, turning point indicators are designed to detect trend changes in the economy as soon as they occur.

II.1 Producing the turning point indicator

The method used is described in detail in Appendix 4. The main difficulty in estimating this indicator lay in the combined processing of monthly, two-monthly and quarterly variables. While the existing estimates only used series with the same frequency, the approach adopted here considered a far wider choice of balances of opinion. Additionally, for certain surveys which used to be quarterly, then monthly, the period of available information has been considerably increased. This 'multifrequency' processing thus provides a monthly indicator since the end of the 1970s, making the best possible use of all the available economic information.

Built using the same variables as the business climate indicator...

As regards the choice of all the variables to be used, the turning point indicator presented below was based on the same set of informative variables as those used by the business climate indicator for France⁽⁶⁾. These are the 26 balances of opinion presented in Appendix 1.

(6) Other methods have been tested, such as automatic selection of the balances of opinion to be used (iteratively, this procedure was a step-by-step elimination of the least informative balance according to the suitability of the indicator obtained at a reference date estimated from the GDP), or manual selection of the set of variables to be used. The results obtained were fairly similar from one set of variables to the next, once all the main sector surveys were included. The differences in profile of the turning point indicators were small, most often relating to uncertain phases between favourable and unfavourable economic situations.

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II.2 The turning point indicator gives a view of past economic cycles

... it detects trend reversals that are very close to those of GDP growth

The quality of the estimated turning point indicator over the past period can be judged by comparing the signal it gives out with a reference cycle dating system estimated from GDP and corresponding to growth cycles (see box).

The filtered indicator using only past information in its estimate was more or less equivalent to the signal which could have been issued in real time ⁽⁷⁾, while the smoothed indicator should be interpreted as a retrospective view of the indicator over a given period, using both past and future information. Excluding the 1983-1987 period, which was a period of growth without any clear trend (year-on-year GDP varied from 1% to 2%), the economic cycles described by the indicator were very similar to those indicated by the GDP reference dating system (see Chart 3).

Furthermore, the turning point indicator was generally a little ahead, except in 1998 - 1999 when it appeared slightly behind.

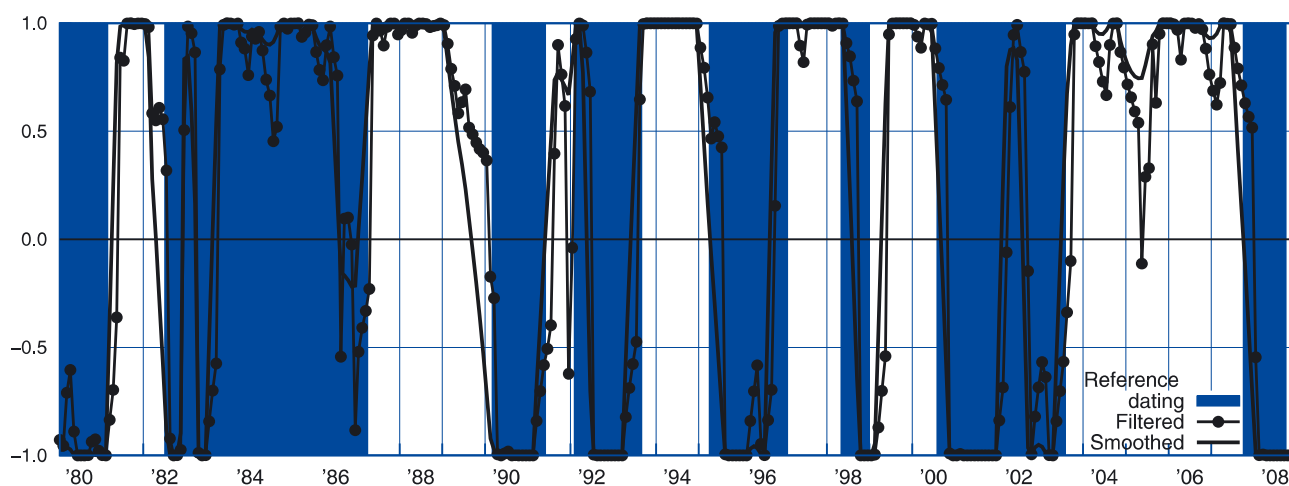
II.3 The behaviour of the indicator in real time

This new turning point indicator is very stable

After showing that the new reversal indicator described past GDP cycles correctly, we attempted to validate its stability over time. To do so, a real-time simulation was conducted, as with the business climate indicator. It was shown that the economic message sent out at a given date was barely revised with the arrival of later information. Graph 4 shows this. It presents the three indicators estimated in January 2000, July 2004 and January 2008, as well as the latest indicator to date, estimated in November 2008. Over the common estimation periods, there was generally little in the way of divergence between the different versions of the indicator. In some cases, the levels reached in the latest months of the estimate may have been revised in the following months (by a few tenths at most). But most of the time, the phase detected in a given month was not revised thereafter. The

⁽⁷⁾ The main difference compared to a real-time estimation of the indicator is that here the parameters are estimated over the period as a whole, but only for the past in a real-time estimation. This difference can sometimes cause differences between the filtered indicator and what a true real-time indicator would be, but as Graph 4 illustrates, the deviations since 1998 have generally been very low.

3 - The new turning point indicator for France compared to a dating of GDP



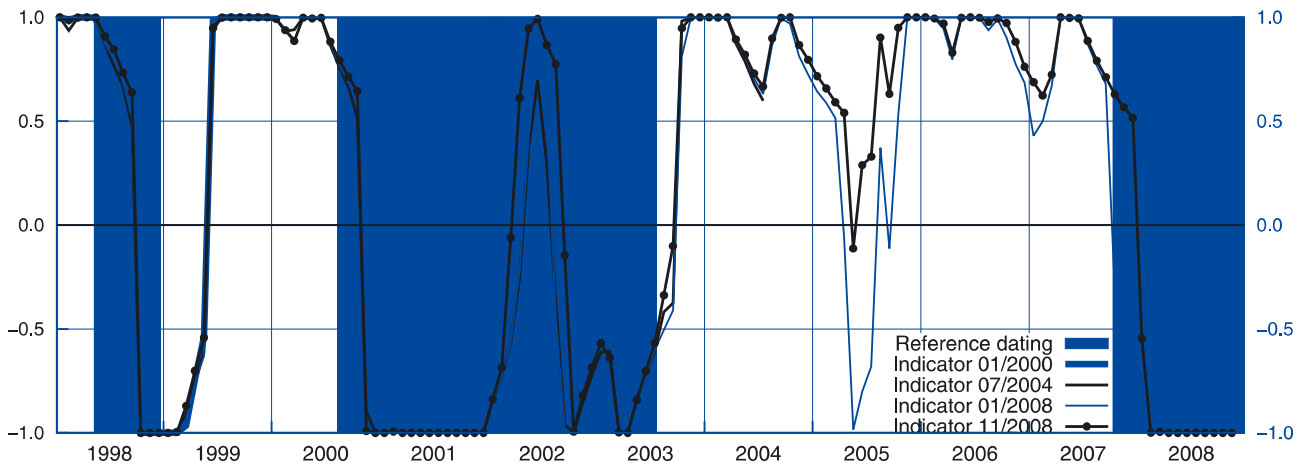
How to read this Chart: The shaded sections (respectively white) represent the periods where GDP growth is lower (higher) than the medium-term trend.

Source: Insee

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turning point indicator can therefore be used for business cycle diagnosis without any fear of major revisions. There was, however, a minor exception as regards the two estimates of January and November 2008: the spring 2005 period, marked as an unfavourable phase in January, now appears as an uncertain phase.

4 - Simulation of the real-time behaviour of the filtered turning point indicator for France



How to read this Chart: The January 2000 (resp. July 2004 and January 2008) indicator is the one that could have been estimated at that date by using the 26 balances of opinion selected.

The November 2008 indicator is the one estimated in November from the latest business tendency surveys.

Source: Insee

Box – The different types of economic cycles Business Cycles (BC), Growth Cycles (GC) and Growth Rate Cycles (GRC)

There are three ways of defining the phases of a cycle followed by a given series (GDP, for example), according to the way the peaks and troughs are determined (Anas and Ferrara, 2004). The first, which defines the Business Cycles (BC), consists in defining the peaks and troughs as the minimum and maximum points in the level of that series (points A, B and C on the figure, top left). In a country like France, recessions are far less common than slowdowns, which is why two other types of cycle have been introduced alongside the business cycle. Growth Cycles (GC) are based on deviations from trends: the peaks and troughs correspond to the points where there is the greatest deviation – positive or negative – from the trend (points D, E and F or D', E' and F' on the figures, top and middle left). The last type of cycles (Growth Rate Cycles, GRC) is defined via the growth rate of the series, and the peaks and troughs correspond to the maximum and minimum points in this growth rate (points G, H and I on the figure, middle left).

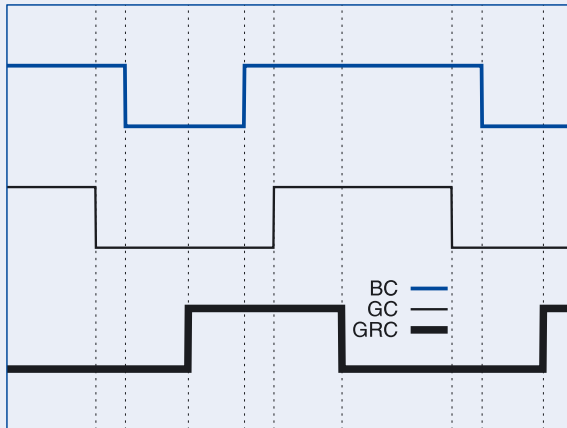
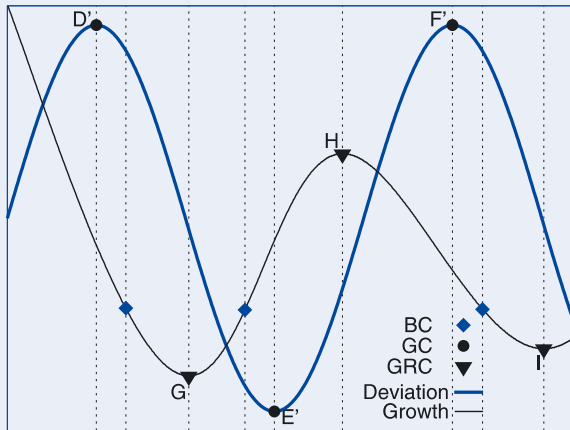
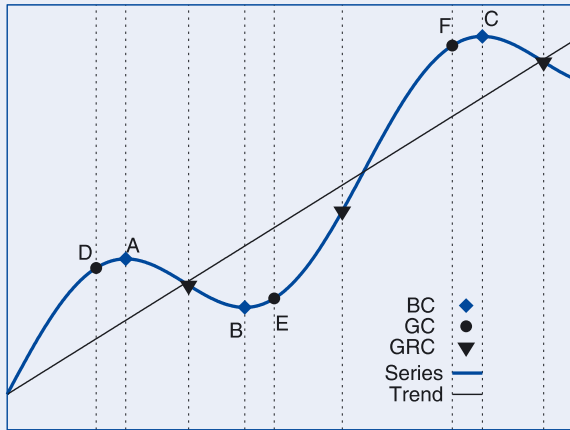
When making a diagnosis of the economic outlook, the most interesting item is to know whether growth is below or above “mean” growth.⁽¹⁾ For the GDP reference dating we therefore use a dating system corresponding to the growth cycles (GC) in relation to the trend (points D, E, F).

The reference series corresponds to GDP as measured by the quarterly national accounts (chart, top right). The Christiano-Fitzgerald filter is used to extract the cyclical component of GDP (see chart, middle right), which shows the cycles which are between one-and-a-half and ten years long. Lastly, the peaks and troughs in this cyclical part are determined. The dark bands and the light bands (see chart, bottom right) respectively correspond to slowdowns and upswings. ■

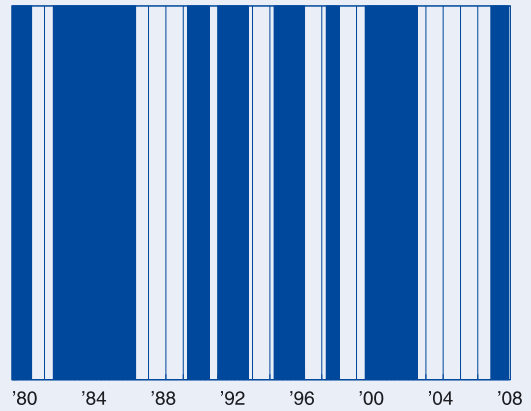
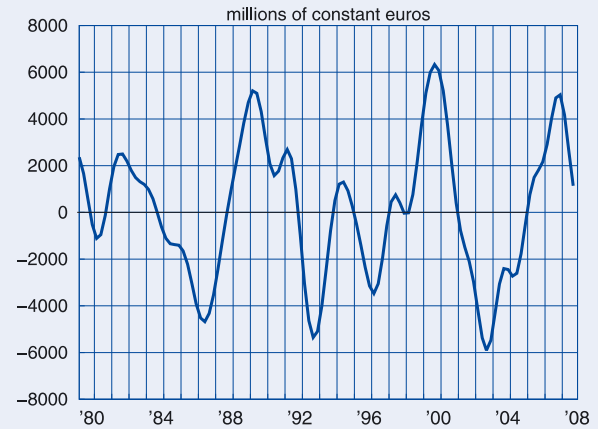
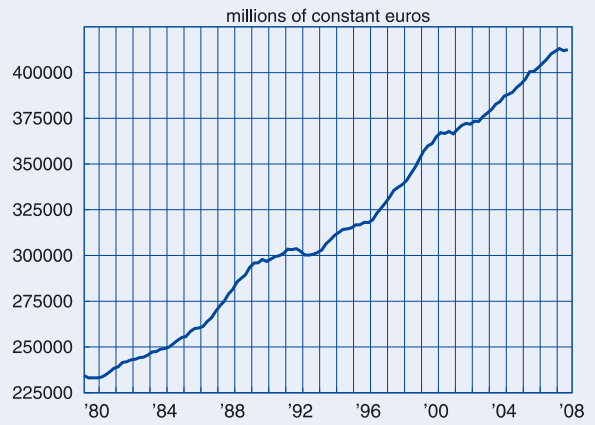
(1) Over the medium term, the French economy is showing average growth, in the region of 2% per year.

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Theoretical definition of the three cycles



The growth cycle in France



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III What these two new indicators provide compared to the existing indicators

For both the business climate indicator and the turning point indicator for France, it is possible to compare the message given on the French economy as a whole with the messages coming from the indicators already published on each of the main economic survey sectors.

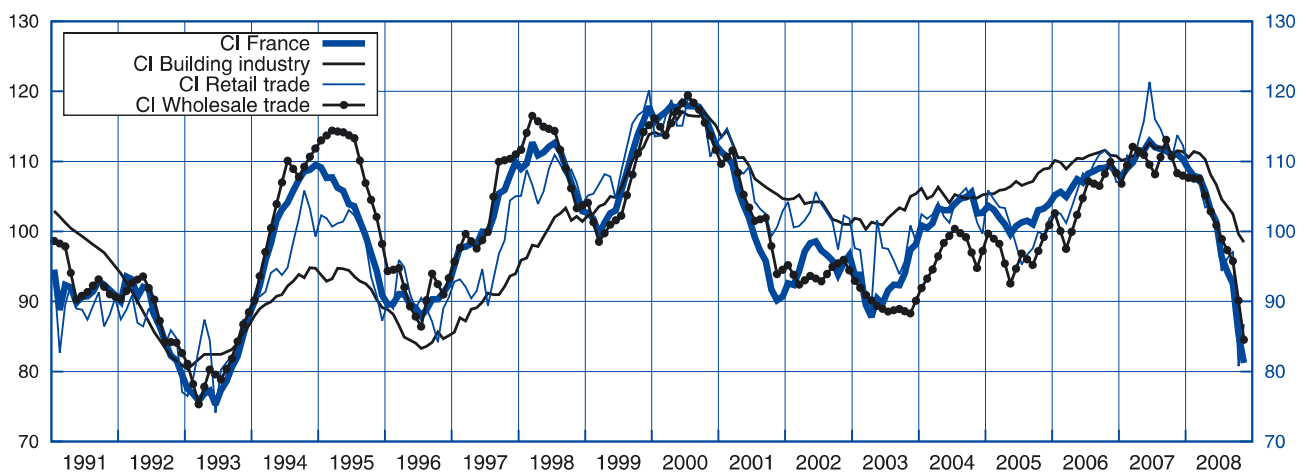
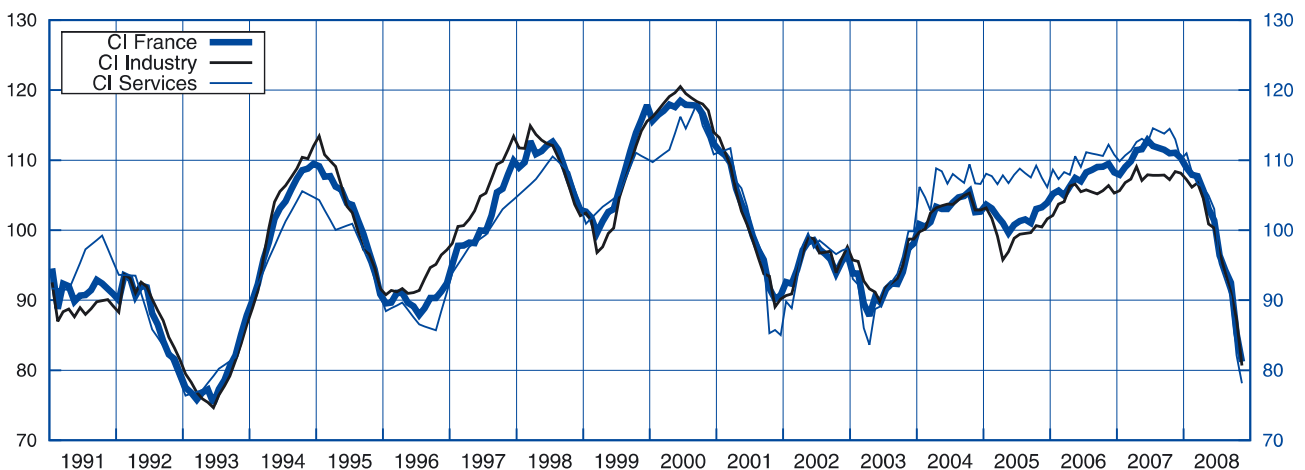
III.1 Comparison of the business climate indicator for France with the sectoral climate indicators

The business climate indicator for France summarises all the business situation trends common to all sectors. It thus offers an overall view of the economic cycles of the French economy as a whole.

Globally synchronous indicators...but with their own specific features

The business climate indicators – for France or sectoral – are all strongly correlated with each other (see Table 5 and Charts 5). Notwithstanding sectoral specificities, this good correlation emphasises the existence of strong links

5 - France and sectoral business climate indicators



How to read these Charts: Standardized indicators with a mean of 100 and standard deviation of 10 over the period 1991-2007. The sectoral business climate indicators therefore do not correspond exactly to the indicators published at present by INSEE, as they are standardised over different periods.

Source: INSEE

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between the various branches, and dynamics shared by the French economy as a whole. And yet there are also singular characteristics. A comparison of this indicator with each of the sectoral climate indicators sheds light on the economic condition of a sector in relation to the overall situation. It also gives a view of the order in which the sectors have been affected by a given slowdown.

Comparison shows the origin of growth

Economic forecasters generally give their preference to the industrial sector when making their diagnoses of the French economy as a whole. It is true that industrial production explains a large share of overall economic fluctuations: manufacturing production contributed to 80% of variance in quarterly GDP growth over the period 1978-2007. This importance of the manufacturing sector is reflected in the fact that the correlation between the business climate indicator for France and that of the industry sector is the strongest. However, the other sectors are also important. As an illustration, since 2004 growth has been driven more by services than by industry, and the France indicator has been above the industry indicator. Another example: the business climate indicator for France was higher than the business climate indicators in services and in industry at the end of 2001, owing to resilience in the other sectors, trade and building industry.

In particular, the old saying "when building goes, everything goes!" takes a hit

Changes in the economic situation are usually concomitant between the overall composite indicator and those of industry and services, according to analysis of correlograms (correlations with one of the two indicators ahead or behind). They are slightly ahead in the trade sectors; on average, the building sector is slightly behind (around two or three months). In the light of the business climate indicators, the old saying "when building goes, everything goes!" takes something of a hit: proof of this is seen at the end of the period, when the business climate indicator in building industry remained at a high level while the other sector indicators and the global indicator dropped to levels far below their long-term average.

III.2 Comparison of the turning point indicator for France with the sector turning point indicators

The turning point indicator for France is less volatile than the sector indicators. It is also a little more leading

In comparison with the sector turning point indicators, the turning point indicator for France appears to be a little more leading and less volatile (see *Graphs 6*). Indeed, by definition, it benefits from all the sector surveys, and the occasional sector-specific fluctuations are tempered in the global indicator.

In more detail, the indicator in industry shows a distinct time lag and missed the slight upturn that started in mid-1991. The indicator in building industry is fairly similar to that of France, but the turning point indicator in the wholesale trade is even closer to it.

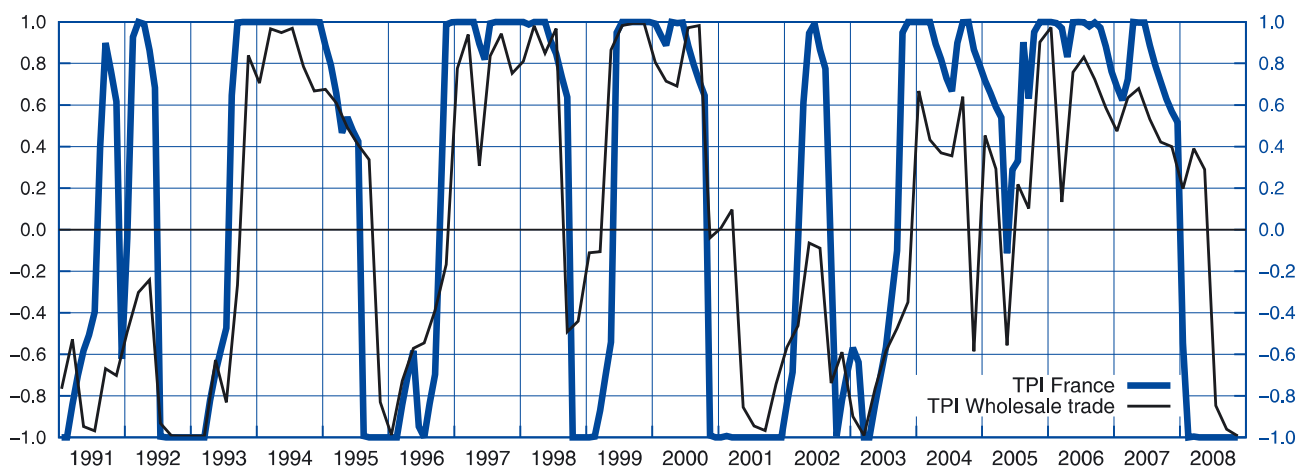
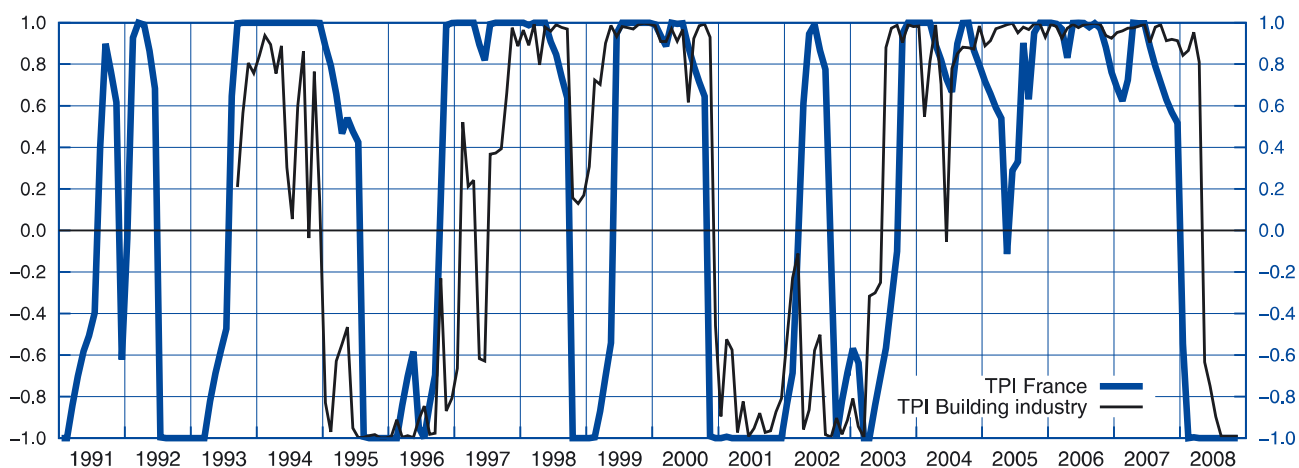
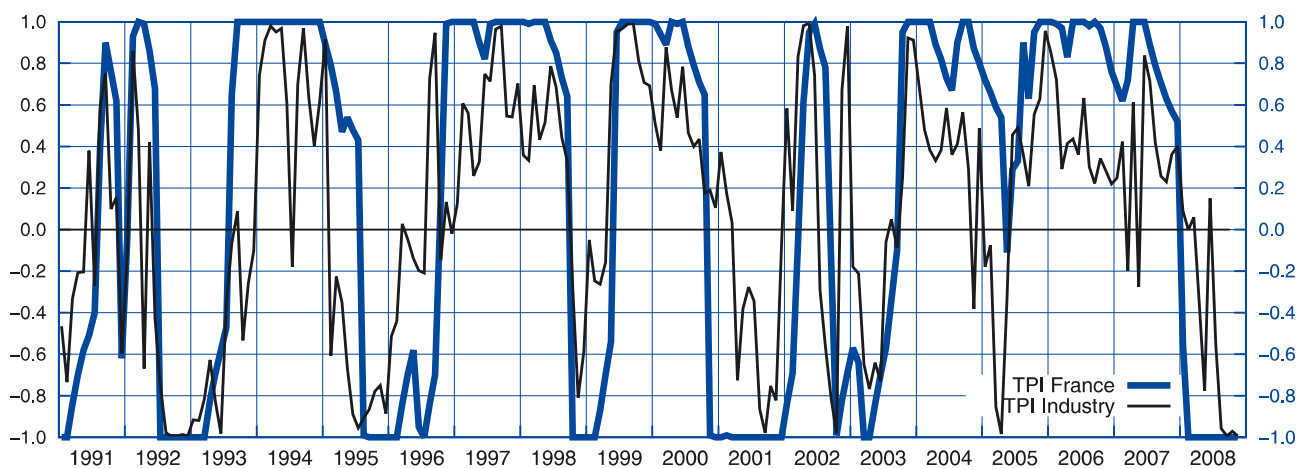
Table 5

Correlations between the different business climate indicators

Correlation coefficients	IC France	IC Industry	IC Services	IC Building ind.	IC Retail trade	IC Wholesale trade
CI France		0,97	0,95	0,74	0,90	0,93
CI Industry	0,97		0,88	0,63	0,84	0,92
CI Services	0,95	0,88		0,80	0,87	0,81
CI Building ind.	0,74	0,63	0,80		0,85	0,57
CI Retail trade	0,90	0,84	0,87	0,85		0,80
CI Wholesale trade	0,93	0,92	0,81	0,57	0,80	

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6 - France turning point indicator and main sectoral indicators



How to read these Charts : each sectoral turning point indicator corresponds to the one published in the *Informations Rapides* of the corresponding surveys. The France indicator is the one presented in Graph 4. The indicators are filtered.

Source: INSEE

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A comparison of the sectoral and aggregate signals is useful for analysis purposes

Use of the turning point indicator for France in analysing the economic situation is even more interesting. For example, the favourable cycle signalled by the turning point indicator for France from mid-2003 ended at the beginning of 2008, and since then the negative phase has been prolonged and confirmed. This pattern was not so clear-cut over the same period for the indicators in industry and wholesale. Each sectoral turning point indicator showed different start and end points for this favourable phase. However, the information from the sector is also useful because it shows how the sector messages and the global economic message fit together.

IV A new reading of French economic cycles using these two indicators

The two new indicators offer a new reading of previous cycles.

A comparison of the two new indicators for France – business climate and turning point – on the same graph confirms their complementary nature (see Chart 7). They plot the main phases in French economic cycles over the last 30 years. We can distinguish thirteen periods in the French economy from 1980 to mid-2007. The more recent period will be analysed in Part 5 which details the current situation.

*1980 Q1 - 1981 Q1:
very weak growth*

From the first quarter of 1980 to the first quarter of 1981: very low growth rate following the second oil crisis, even showing a 0.5% slip in GDP in the second quarter of 1980. This slowdown was clearly shown by the turning point indicator as early as the month of January 1980. The business climate indicator dropped continually from October 1979 to March 1981, when it reached a low point.

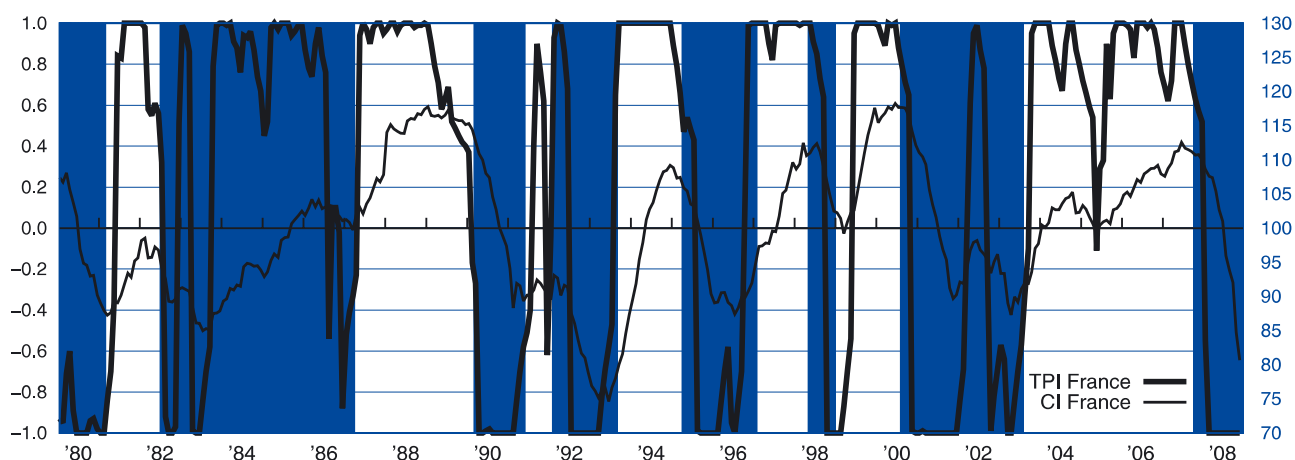
*1981 Q2 - 1982 Q2:
slight upturn*

From the second quarter of 1981 to the second quarter of 1982: slight upturn. The business climate indicator started rising in April 1981 but remained below its long-term average, while the turning point indicator moved up into the favourable zone in June 1981.

*1982 Q3 - 1983 Q3:
relative stability*

From the third quarter of 1982 to the third quarter of 1983: relative stability. Both indicators showed a rather unfavourable economic situation. The upturn seemed to be coming, as shown by the small jump in the business climate in late 1982 and

7 - France business climate and turning point indicators



How to read this Chart: the shaded sections (respectively white) represent the periods where GDP growth is lower (higher) than the medium-term trend.

Source: INSEE

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the brief positive signal given by the turning point indicator between January and March 1983, but was not quite able to gel. This period would appear to be a time of transition between the oil shock and countershock.

1983 Q4 - 1987 Q1: gradual upswing

From the fourth quarter of 1983 to the first quarter of 1987: gradual upswing. The business climate indicator rose almost continually from October 1983 (but remained below its long-term average until September 1985) and the turning point indicator signalled an acceleration phase, also from October. This was nonetheless moderate and GDP growth remained below the long-term trend, hence the shaded section in the GDP reference dating.

1987 Q3 - 1990 Q1: major expansion

From the second quarter of 1987 to the first quarter of 1990: a period of major expansion. The business climate continued to progress and went well beyond its long-term average in January 1988. It almost reached its highest ever level in January 1989, and the turning point indicator was constantly in the favourable zone.

1990 Q2 - 1991 Q2: return to slower growth

From the second quarter of 1990 to the second quarter of 1991: return to slower growth levels. Both indicators clearly showed a slowdown. In December 1989, the business climate entered into a decline that lasted for more than two years. Although this drop seemed very moderate at the beginning (especially as the starting point was also one of the indicator's highest levels), it coincided with a time when the turning point indicator was in the unfavourable zone (April 1990), showing a break with the previous years. The Note de Conjoncture of July 1990 reported on this change of pace, specifying that "the slowdown in world economic activity which started in the middle of 1989 is [now] spreading to the French economy".

1991 Q3 - 1991 Q4: stability

Second half of 1991: stability. This period could be described as a false upturn since it came between the slowdown of 1990-1991 and the recession of 1993. The turning point indicator did indeed make a foray into favourable territory between two unfavourable periods, but the business climate remained stable and below its long-term average. The Note de Conjoncture of December 1991 asked the question "What growth for the start of 1992?" The combined use of these two indicators, notably regarding the long-lasting sluggishness of the surveys as shown by the business climate indicator, would have refined the economic diagnosis and provided a warning to remain prudent and not to overestimate the extent of the upturn.

1992 Q1 - 1993 Q3: recession

From the first quarter of 1992 to the third quarter of 1993: recession, with two consecutive quarters showing a drop in GDP (-0.5 % and -0.7 % respectively for the fourth quarter of 1992 and first quarter of 1993). The business climate, already below its long-term average since the start of 1991, started to drop in March 1992 and this fall gathered pace from June 1992. The turning point indicator settled lastingly in unfavourable territory from June 1992. The INSEE Note de Conjoncture of July 1992 emphasised the decline in investment but pointed out that activity was still sustained. According to the last quarterly accounts, GDP dropped by 0.1 % in the second quarter of 1992 compared to the first quarter. The December Note ⁽⁸⁾, however, forecast 'slowed growth' after the weak second half of the year, partly linked to the effect of the real-estate crisis on businesses. If these indicators had been available at that time, they could have been used to provide a better analysis of the message given by the economic surveys and an evaluation of the extent of the turning point, as early as mid-1992. The scale of the crisis was only underlined retrospectively, in the Note de Conjoncture of July 1993 entitled 'Recession and Adjustments' which already mentioned the trend towards improvement.

(8) Until 1996, the Note de Conjoncture was six-monthly.

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*1993 Q4 - 1995 Q1:
upswing* From the fourth quarter of 1993 to the first quarter of 1995: upswing and strong growth. From August 1993, the turning point indicator once again moved into the favourable zone and the business climate started to climb. The French economy saw renewed growth which was particularly sustained up to the first quarter of 1995. The improvement was confirmed in the Note de Conjoncture of March 1994: "From the second quarter, the economic situation gradually looked up".

*1995 Q2 - 1996 Q4:
moderate growth* From the second quarter of 1995 to the fourth quarter of 1996: moderate growth. In early 1995, growth steadied. The France composite indicator fell in January but remained far higher than the low point of 1993. The turning point indicator suggested sub-trend economic growth in August 1995 and therefore announced the halt in growth of the third quarter of 1995 in real time. The Note de Conjoncture of March 1996, giving a first report on the year 1995, spoke of 'slowed growth' in 1995 and a possible 'recovery' in the first half of 1996.

*1997 Q1 - 2000 Q2:
strong growth* From the first quarter of 1997 to the second quarter of 2000: strong growth. The upturn was announced in the last few months of 1996 with the recovery of the business climate and the return to the favourable zone for the turning point indicator. The 1996 note forecast an "acceleration, notably in Europe", but the clear improvement in the business climate was particularly emphasised in March 1999. At the end of 1998, the temporary drop in both indicators marked the impact of the Asian crisis and the 'air pocket' recorded by the French economy, but the indicators recovered in April 1999. And in fact the Note de Conjoncture of June 1999 carried the title "Rebound". It was not until the end of 1999 that this "upswing phase" (title of the note of December 1999) was actually recognized as such. The note of March 2000, entitled "Steady Speed", contained the following sentence: '1999 demonstrated the robustness of [this] expansion phase underway over the last three years'. This period of strong growth came to an end at the end of the second quarter of 2000, when the business climate indicator reached an all-time high.

*2000 Q3 - 2003 Q2:
slowdown* From the third quarter of 2000 to the second quarter of 2003: slowdown. From the second half of 2000, both the business climate and turning point indicators signalled a deceleration, bringing the vigorous expansion of the previous years to an end. The first reference made to this change was in the Note de Conjoncture of March 2001, which saw "Dark Clouds in the West". The tightening of monetary conditions and the rise in oil prices largely explain this slowdown; it continued until the end of 2001, made worse by the slowing American economy and the attacks of 11 September. In 2002, the French economy seemed to have found restored vigour, as shown by the recovery of both indicators. However, this hint of a recovery did not really bear fruit until the third quarter of 2003.

*2003 Q3 - 2007 Q3:
relatively sustained growth* From the third quarter of 2003 to mid-2007: more sustained growth. From the end of 2003, France returned to growth that was closer to long-term trends. This acceleration was mainly due to an improvement in the international context. The business climate indicator rose sharply and the turning point indicator once again moved to +1 in October 2003.

Between 2005 and 2007, the economic situation was favourable according to the business climate and turning point indicators. Growth was above 2% over this period, although it was lower than what the surveys led to expect. This deviation between the cycle as plotted by the business climate indicator and accounting data (see *Chart 2*) may be the sign that growth is currently underestimated over the period; incidentally, it is still likely to be revised by the national accountants

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over 2006 and 2007. However, it is not proof of this: deviations of this amplitude have already occurred in previous periods for which the growth figures are now final (the 1981 - 1984 period, for example).

V The current economic situation as seen by these two indicators

The indicators point to a slowdown in activity in the second half of 2008

As far as the current period is concerned, the business climate indicator for France began to drop in mid-2007 and has lost more than 30 points in the space of 18 months, which is the equivalent of three standard deviations. At the end of 2007, the return to slower growth in the French economy was perceptible and the extent of this reversal was beyond doubt by June 2008. Indeed, the 2008 Note was entitled "Gearing Down". The turning point indicator also confirmed the diagnosis and, in real time, signalled a highly unfavourable economic climate as early as January 2008. The change in trends was noted in the second quarter accounts published in August 2008, with a drop of 0.3% in GDP. The continuing slide of the business climate indicator in the second half of 2008 suggests that the economic situation is getting worse. Similarly, the turning point indicator has long remained at -1. So, notwithstanding the apparent resistance shown by the French economy in the third quarter of 2008, these indicators are firmly pointing to a drop in activity for the second half of 2008. Furthermore, these indicators do not show signs of a recovery in the short term, and prospects look bleak for the start of 2009.

For the moment, the downturn appears to be slightly less profound...

Compared with the 1990 recession - the "benchmark crisis" - the business climate indicator for France is still six points higher than the lowest level of June 1993 (75 points). The sectoral business climate indicators are also slightly higher than their low point of 1993, except for the one in services which is already close to the value of January 1993 (less than two points' difference). In terms of level, the point reached just prior to the current crisis was far higher than before the 1993 crisis.

... but already longer than the 1993 recession

Correlatively, the current downturn phase is already longer than that of 1993. The sectoral business climate indicators have dropped continually for 18 months, against 16 months at most in 1993, with the exception of the construction business climate indicator, as the real-estate market reversal started before the global economic crisis in 1993. Conversely, in November 2008 the business climate indicator in building industry was barely lower than its long-term average, almost 20 points higher than its low level of January 1993.

All the sectoral turning point indicators signal an unfavourable phase. ■

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Appendix 1 – Balances of opinion in the France composite indicators

PATOV_SERV^{(obj)(subj)}: past turnover trends in services (quarterly, then monthly from June 2000)

EXTOV_SERV^{(obj)(subj)}: expected turnover trends in services (quarterly, then monthly from June 2000)

GENO_SERV^{(obj)(subj)}: general outlook in services (monthly from June 2000)

EXDEM_SERV: expected demand in services (quarterly)

PAOPP_SERV: past operating profit trends in services (quarterly)

EXOPP_SERV: expected operating profit trends in services (quarterly)

GENO_IND^(obj): general outlook in manufacturing industry (monthly)

PAPROD_IND^{(obj)(subj)}: past production trends in manufacturing industry (monthly)

EXPROD_IND^{(obj)(subj)}: expected production trends in manufacturing industry (monthly)

INV_IND: inventories levels in manufacturing industry (monthly)

EXFOR_IND^{(obj)(subj)}: foreign order books in manufacturing industry (monthly)

EXOOR_IND^(subj): overall order books in manufacturing industry (monthly)

PAACT_BLD: past activity trends in the building industry (quarterly, then monthly from September 1993)

EXACT_BLD: expected activity trends in the building industry (quarterly, then monthly from September 1993)

LOR_BLD^(subj): order book level in the building industry (quarterly, then monthly from September 1993)

PASTA_BLD^(subj): past staffing trends in the building industry (quarterly, then monthly from September 1993)

PCUR_BLD: production capacity utilisation rate in the building industry (quarterly, then monthly from September 1993)

OOR_RET: order intentions in the retail trade (monthly)

GENO_RET^{(obj)(subj)}: general outlook in the retail trade (monthly)

PASALE_RET: past sales trends in the retail trade (monthly)

EXSTA_RET: expected staffing trends in the retail trade (monthly)

PASALE_WHOT^{(obj)(subj)}: past sales trends in the wholesale trade (bimonthly)

PAFSALE_WHOT: past foreign sales trends in the wholesale trade (bimonthly)

OOR_WHOT^(obj): order intentions in the wholesale trade (bimonthly)

GENO_WHOT^(obj): general outlook in the wholesale trade (bimonthly)

FORDEL_WHOT^{(obj)(subj)}: deliveries received from abroad in the wholesale trade (bimonthly)

(obj): balances used to build the business climate indicator CI12obj

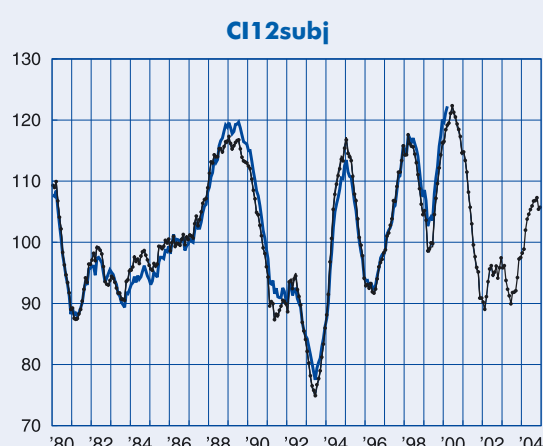
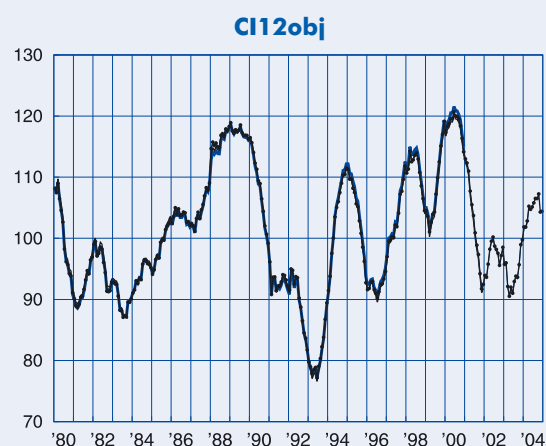
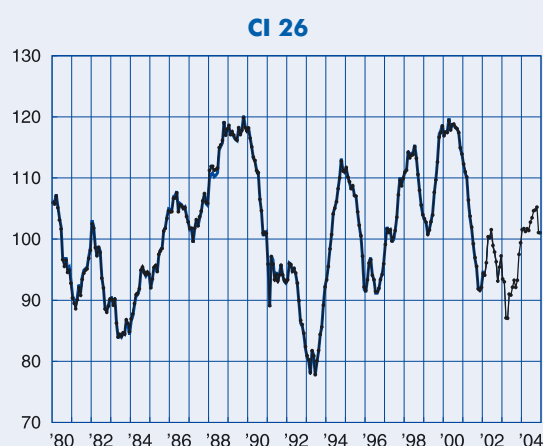
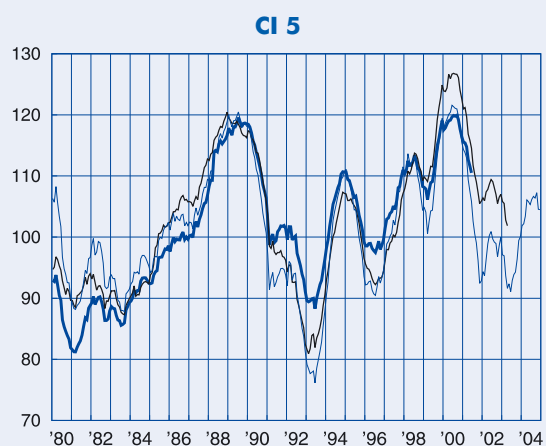
(subj): balances used to build the business climate indicator CI12subj ■

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Appendix 2 – Stability over time of the various business climate indicators

For each type of business climate, 72 real-time estimates were made over the period from January 1999 to December 2004. The first estimate covered the January 1980 - January 1999 period, and the last covered the January 1980 - December 2004 period.

Below are the four most different estimates in order to show the more-or-less stable character of the indicators. ■



How to read these Charts: CI5 is the business climate indicator built from the five sectoral business climates; CI12obj (resp. CI12 subj) is the business climate indicator built from the 12 objectively selected balances (resp. subjectively); last, CI26 is the business climate indicator based on the 26 balances used in the calculation of sectoral business climates (see Annexe 1 for the list of balances).

Appendix 3 – Dynamic factor analysis

Dynamic factor models are currently used in a great many economic fields (see Geweke (1977), Stock and Watson (1989, 2002), Forni et al. (2000)). In such models, the observed time variables (here, the balances of opinion in surveys) are assumed to depend in linear fashion on a small number of unobservable underlying variables known as factors. Two methods are mainly used to estimate them. The first concerns frequencies and is basically a particular breakdown of the spectral density of the vector process constituted by all the variables studied. The second concerns time, and assumes a modelling of the dynamics of the factors. It is this model that has been used here.

The unobserved component model

At each month t , each balance of opinion y_{it} is expressed as the sum of two unobserved components:

- a term $\lambda_i \bar{F}_t$, proportional to the common factor F_t ;
- a component u_{it} , specific to the balance of opinion i under consideration, also called a residual.

The dynamic of the common factor is modelled by an ARMA process (in practice, an ARMA(2,1) ⁽¹⁾, while an AR(1) model has been used to represent the residuals dynamic.

$$\begin{cases} y_{it} = \lambda_i F_t + u_{it} \\ F_t = \phi_1 F_{t-1} + \phi_2 F_{t-2} + \varepsilon_t - \theta \varepsilon_{t-1} \\ u_{it} = \rho_i u_{it-1} + \varepsilon_{it} \end{cases}$$

(ε_t) and (ε_{it}) are the innovations (\bar{F}_t) of and (u_{it}) respectively; (ε_t) and (ε_{it}) are independent Gaussian white noise with respective variance of 1 and σ_i^2 . Indeed, as the common factor (\bar{F}_t) is defined except for one multiplying constant, constraint $V(\varepsilon_t) = 1$ is imposed in order to make the model identifiable.

(1) The business climate indicator is fairly insensitive to the order of the ARMA representation.

y_{it} represents the value of the i^{e} balance of opinion ($i=1\dots 26$) at month t . The balances of opinion are corrected for seasonal variations and are centred and reduced. The parameters to be estimated are: $\lambda_i, \phi_1, \phi_2, \theta, \sigma_i, \rho_i$

Space-state representations

This unobserved components model allows a representation known as linear space-state (see Hamilton (1994) or Kim and Nelson (1999) for an overview of space-state models), which makes likelihood easier to calculate. With the aid of this representation, it is possible to use the Kalman filter (Hamilton (1994) and Kim and Nelson (1999)) to calculate likelihood and to estimate the model's parameters.

$$\begin{aligned} y_t &= Z_t \alpha_t && \text{(measurement equation)} \\ \alpha_t &= A \alpha_{t-1} + R \eta_t && \text{(state equation)} \\ \alpha_1 &\sim N(0, \Sigma) && \text{(initial condition)} \end{aligned}$$

In this representation:

- y_t is the column vector of the balances of opinion observed for each month t ; the dimension nt of this vector changes over time because certain series are only observed bimonthly or quarterly;
- Z_t is the measurement matrix; the number of lines of Z_t is equal to the number of observations at month t and therefore varies according to time.
- $\alpha_t = (\bar{F}_t, F_{t-1}, \varepsilon_t, u_{it})'$ is the state vector, and its content closely depends on the ARMA process used for the common factor and the residuals;

Definition of the business climate indicator

The business climate indicator (CI) corresponds to the conditional expectation of the common factor in the knowledge of the information up to date t : $IC_t = \hat{F}_{t|t} = E(\bar{F}_t | I_t)$. ■

Appendix 4 – Methodology for the Markov switching indicator

The method used to produce the France turning point indicator was inspired by that of Gregoir and Lengart (2000). However, the adaptations required for the present case, using monthly, bimonthly and quarterly series, involved modifying the stage where the indicator estimate was filtered. Only the general principles of this method are set out here.

Modelling

The phase of the economy was represented at each date by an unobserved discrete variable taking value +1 for a growth acceleration phase and value -1 for a slowdown. Z_t possessed the dynamics of a first-order homogenous Markov chain in which the transition matrix parameters were estimated (they were probabilities $P(Z_t | Z_{t-1})$).

Additionally, we observed a set of P series of monthly, bimonthly or quarterly quantitative observations, noted $Y = (Y_t^p)$, where t was the information collection month ranging between 1 and T , and p the series index. These observed series were coded into qualitative variables (X_t^p) which, at each date t and for each series p , could only take two possible values (+1 or -1). The idea underlying this coding was to extract the direction, either upward or downward, of the new information in order to perceive any turning points as best possible. In practice, for each series Y_t^p , the coded information was determined according to the position of the variation over three months $\Delta_3 Y_t^p = Y_t^p - Y_{t-3}^p$ in relation to the median of the variations in this series over the period as a whole:

$$X_t^p = 1_{(\Delta_3 Y_t^p > \text{médiane}(\Delta_3 Y_{sp}), s=1, \dots, T)} - 1_{(\Delta_3 Y_t^p < \text{médiane}(\Delta_3 Y_{sp}), s=1, \dots, T)}$$

where 1 represents the indicator function.

Note that the bimonthly survey in the wholesale trade underwent particular treatment. The main series in this survey were only introduced into the construction of the turning point indicator when the survey took place, which is once every two months. Consequently, the variation over three months involved an observed series (Y_t^{CG}) and an unobserved series which needed to be estimated (\hat{Y}_{t-3}^{CG}) . This estimation was performed using the half sum of lags two and four. For this survey, the coded

information was therefore based on the following variation:

$$\Delta_3 Y_t^p = Y_t^p - \hat{Y}_{t-3}^p = Y_t^p - \frac{1}{2}(Y_{t-2}^p + Y_{t-4}^p)$$

With a set of available coded monthly observations X_t^p , at each date it was necessary to determine the probabilities of being in each phase of the economy (acceleration phase / slowdown phase), knowing the information available up to that date or knowing the total information: these were respectively the filtered $P(Z_t | I_t)$ or smoothed $P(Z_t | I_T)$ probabilities, with information I_t being the set of coded observations up to date t , $I_t = (X_1, \dots, X_t)$. It could be said that the filtered probabilities represent the relevance of the indicator for economic diagnosis, while the smoothed probabilities give a simplified reading of trends in the economy over the whole study period.

The laws of observations of X_t^p depend on the hidden variables Z_t , and this dependence was represented by constant conditional probabilities $P(X_t^p | Z_t)$, forming the second set of parameters of the model to be estimated. From a heuristic point of view, if the hidden phase is growth ($Z_t = +1$), the probability of obtaining strong growth of the observed variable ($X_t^p = +1$) is greater than if the hidden phase is a slowdown ($Z_t = -1$).

Estimation and results

The space-state model presented was estimated by an iterative maximum likelihood algorithm. This gave the estimation of all the parameters, as well as the filtered and smoothed probabilities of the hidden states.

The turning point indicator corresponds to the difference between the probability that the economic cycle phase is favourable and the probability that it is unfavourable:

$$Ind_t = P(Z_t = +1 | I_s) - P(Z_t = -1 | I_s)$$

When $s=t$, the indicator is said to be filtered, because it only takes account of the information available up to date t . This indicator is an approximation of the indicator which could have been calculated in real time. When $s=T$, the indicator is said to be smoothed, because it is based on all the available information.

The turning point indicator therefore provides a way of interpreting the alternating up and downturns of the French economy, and at the end of the estimation period, it gives an evaluation of the current economic situation. ■