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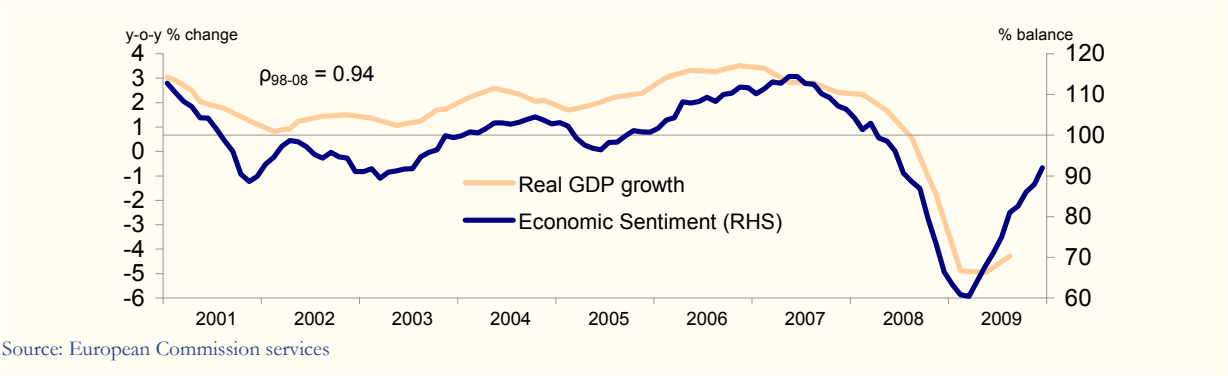
European Business Cycle Indicators

- The economic sentiment indicator continues to improve
- Sentiment in industry the main driver: encouraging order books, ongoing de-stocking
- Unemployment fears fading
- UK services confidence jumps up
- Special focus: *Flash* consumer confidence indicator

Economic sentiment indicators

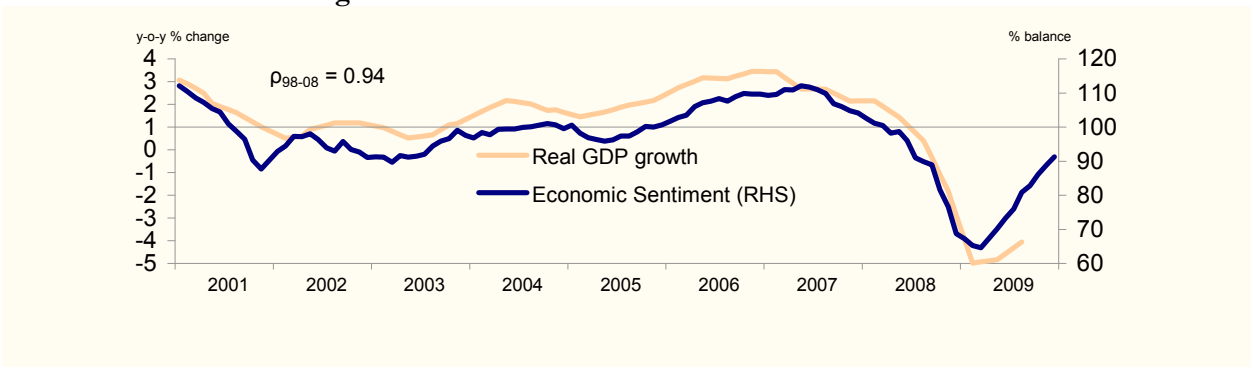
The Economic Sentiment Indicator (ESI) for the EU and for the euro area rose once again in December 2009. It now stands at 92.0 (+4.1) for the EU and at 91.3 (+2.5) for the euro area, which is still below its long-term average. The steady upward trend in the ESI suggests that the year-on-year GDP growth will continue to recover in the fourth quarter of 2009, but still be negative (see Graphs 1a and 1b).

GRAPH 1a: ESI and GDP growth for the EU



Source: European Commission services

GRAPH 1b: ESI and GDP growth for the euro area



Source: European Commission services
Note 1: in RHS 100 = average 90 to 08.
Note 2: both series are plotted at monthly frequency: GDP monthly data are obtained by linear interpolation of quarterly data.

'European Business Cycle Indicators' provides short-term analysis based on Business and Consumer Survey data. It appears monthly, using the latest available data.
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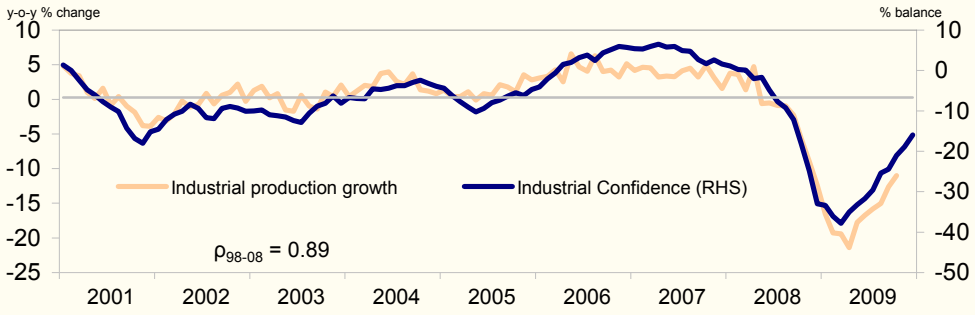
In the euro area, sentiment in industry was the main contributor to the overall improvement in the ESI. The Industry Confidence Indicator gained 3 points in December (see Graph 2), largely due to a significant improvement in managers' assessment of their order books. The stocks balance now stands below its long-term average, further confirming the strong ongoing destocking process. On the other hand, managers seem to have scaled back production expectations with respect to developments observed in the previous months.

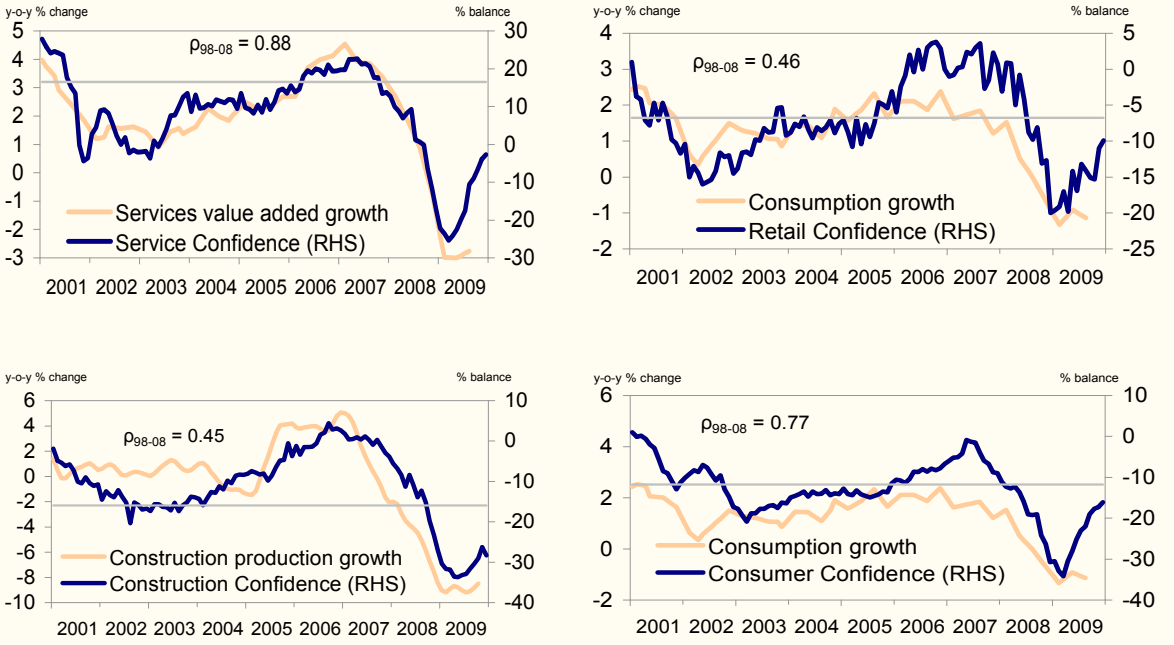
GRAPH 2: Industrial Confidence Indicator and industrial production for the euro area



Source: European Commission services

In December, sentiment in both services and retail trade increased only marginally (by 1 point) in the euro area, standing below its long-term average, whereas the construction confidence indicator declined by 2 points, suggesting subdued developments across these sectors (see Graph 3).
Confidence among consumers improved by 1 point, as unemployment fears faded. This development was consistent with employment expectations, which picked up in both industry and services.

GRAPH 3: Sectoral Confidence Indicator and reference series for the euro area



Source: European Commission services

Economic sentiment indicators for the larger euro area Member States and the UK

At country level, ESI developments were promising, as all the larger euro area Member States and the UK reported improving sentiment (see Graph 4).

France was in the lead, with sentiment rising by 4.1 points driven by a very good performance of the Industrial Confidence Indicator. Confidence also made significant gains in services and retail trade, but remained unchanged among consumers.

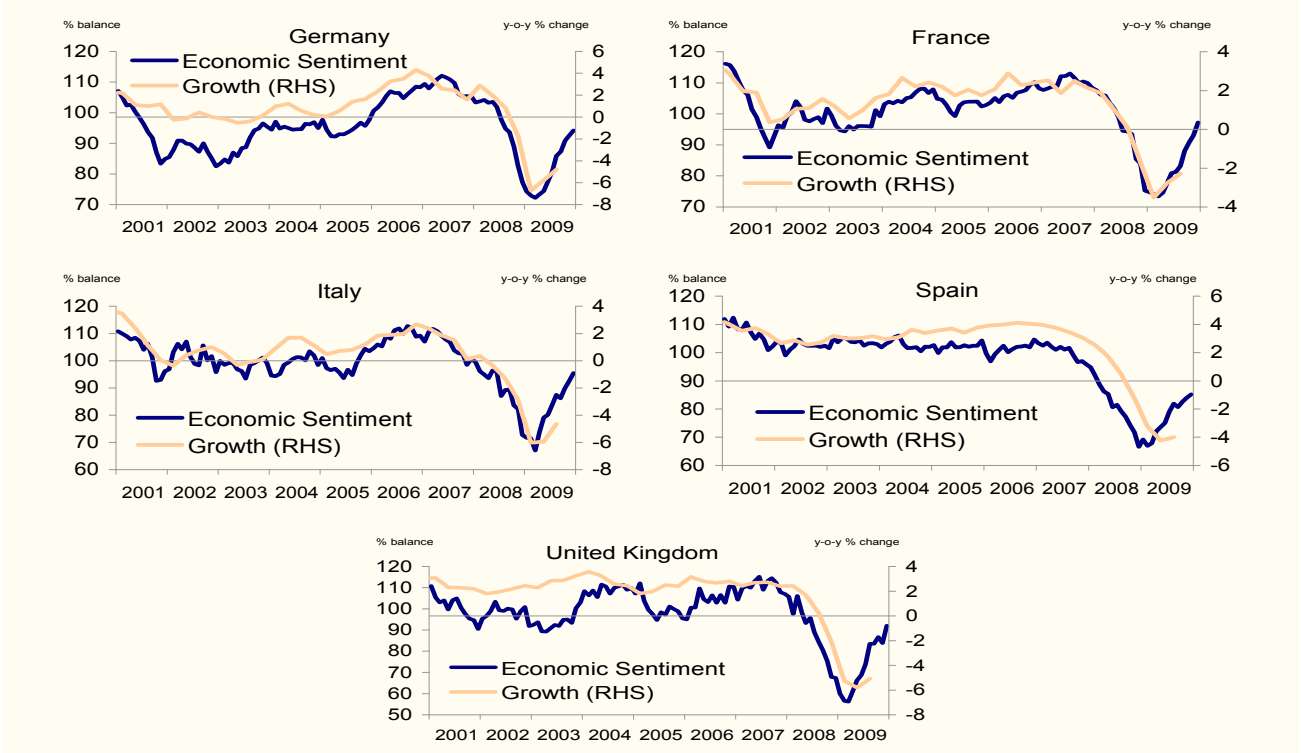
Sentiment improved in Italy too (+2.9), thanks to a strong jump in confidence in industry. The other sectors remained broadly unchanged, whereas confidence in construction decreased sharply.

The ESI continued to increase at a steady pace in Germany (+1.7). Confidence among consumers returned to an upward trend, as the unemployment fears of November faded. Confidence in industry also stayed on its upward trend.

Sentiment in Spain kept pace, increasing by 1.2 points. Confidence in industry, in services and among consumers each contributed equally, whereas confidence in both retail trade and construction dropped.

The ESI posted a sharp increase in the UK (+8.2) thanks to a very strong jump in services confidence. Increased spending/shopping activity (especially in hotels, bars and restaurants) ahead of the VAT increase could be one possible explanation for this development. Confidence picked up significantly in retail trade as well, but stayed unchanged in industry.

GRAPH 4: ESI and GDP growth (year-on-year) for the four larger euro area Member States and the UK



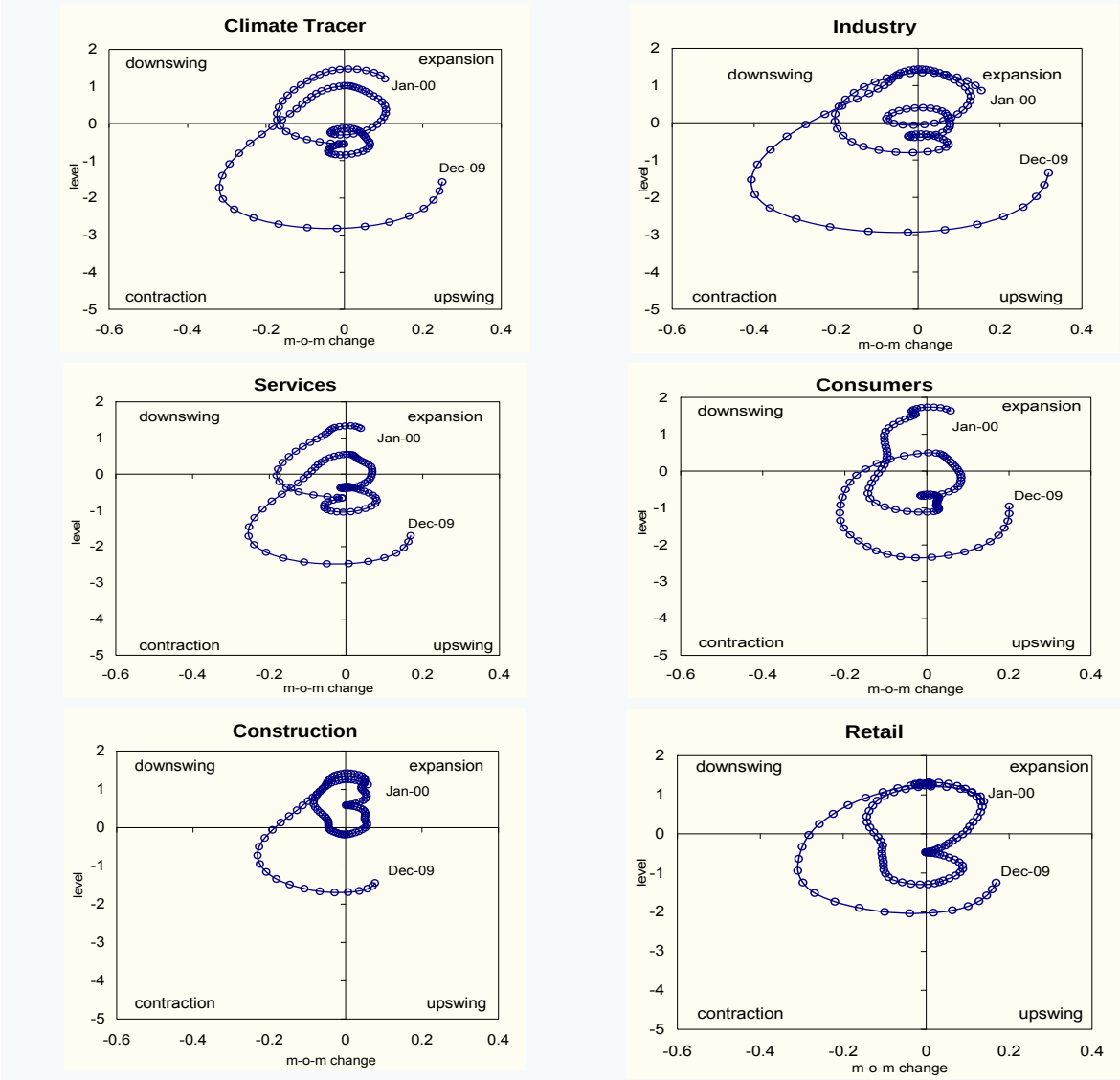
Source: European Commission services

The economic climate tracer

The cyclical movements for the euro area as a whole and at sector level are displayed in Graph 5a, based on the smoothed values indicated by the economic climate tracer. For the euro area, the economic climate tracer is now firmly in the upswing quadrant. All sectors are in the upswing phase as well, with construction lagging behind.

This section shows the results produced by the economic climate tracer (both cyclical movements and cross-section). The graphs depict the results of a two-step procedure (see Annex 1 for details) involving a larger set of series than in the ESI. As a consequence, the message could differ from the above analysis, especially because the economic climate tracer series are smoothed.

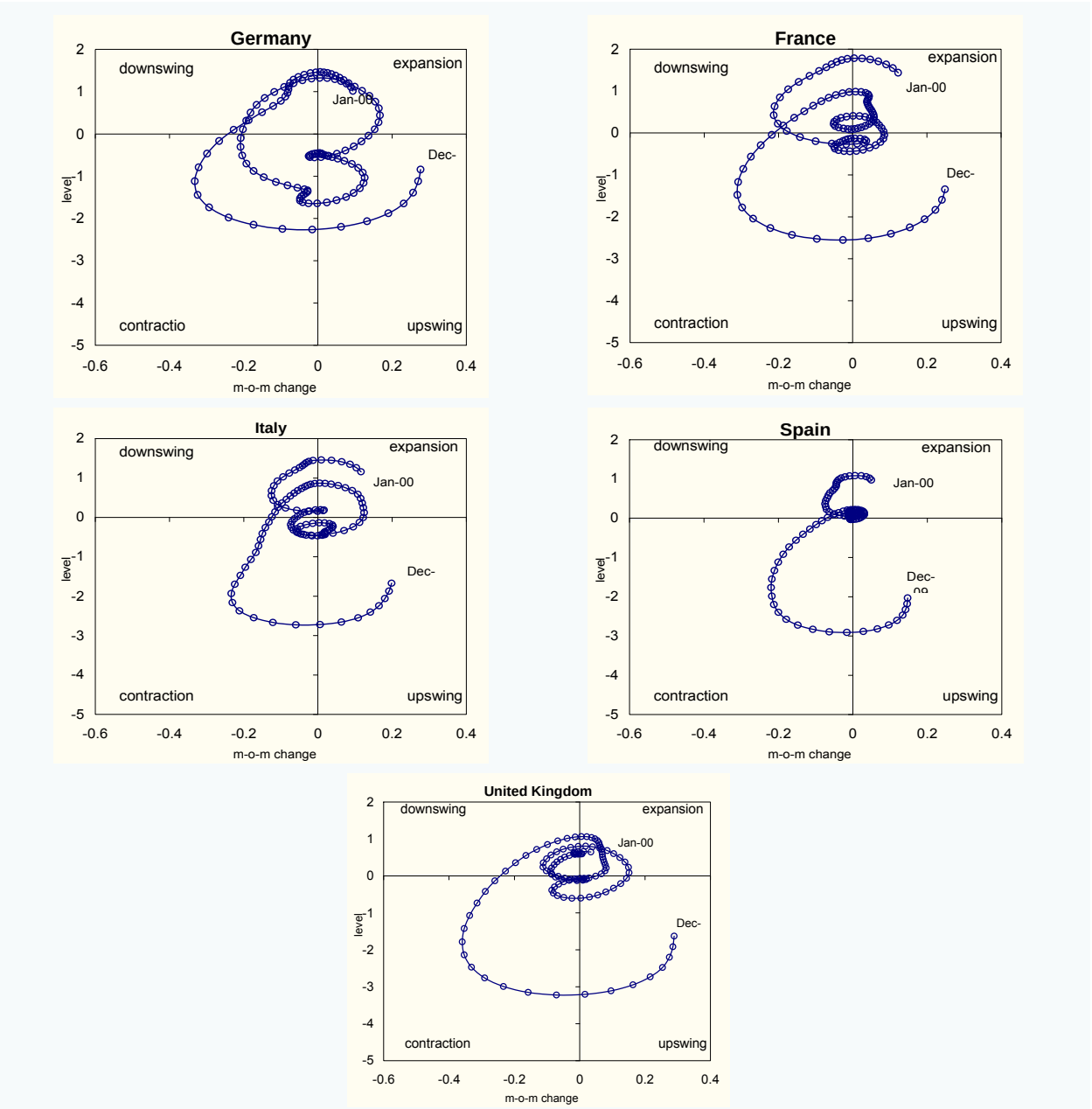
GRAPH 5a: Economic Climate Tracer across sectors, euro area



Source: European Commission services

Graph 5b displays the cyclical movements (based on the economic climate tracer) for the four larger euro area Member States and for the UK. All are in the upswing quadrant, with Germany leading and Spain lagging behind.

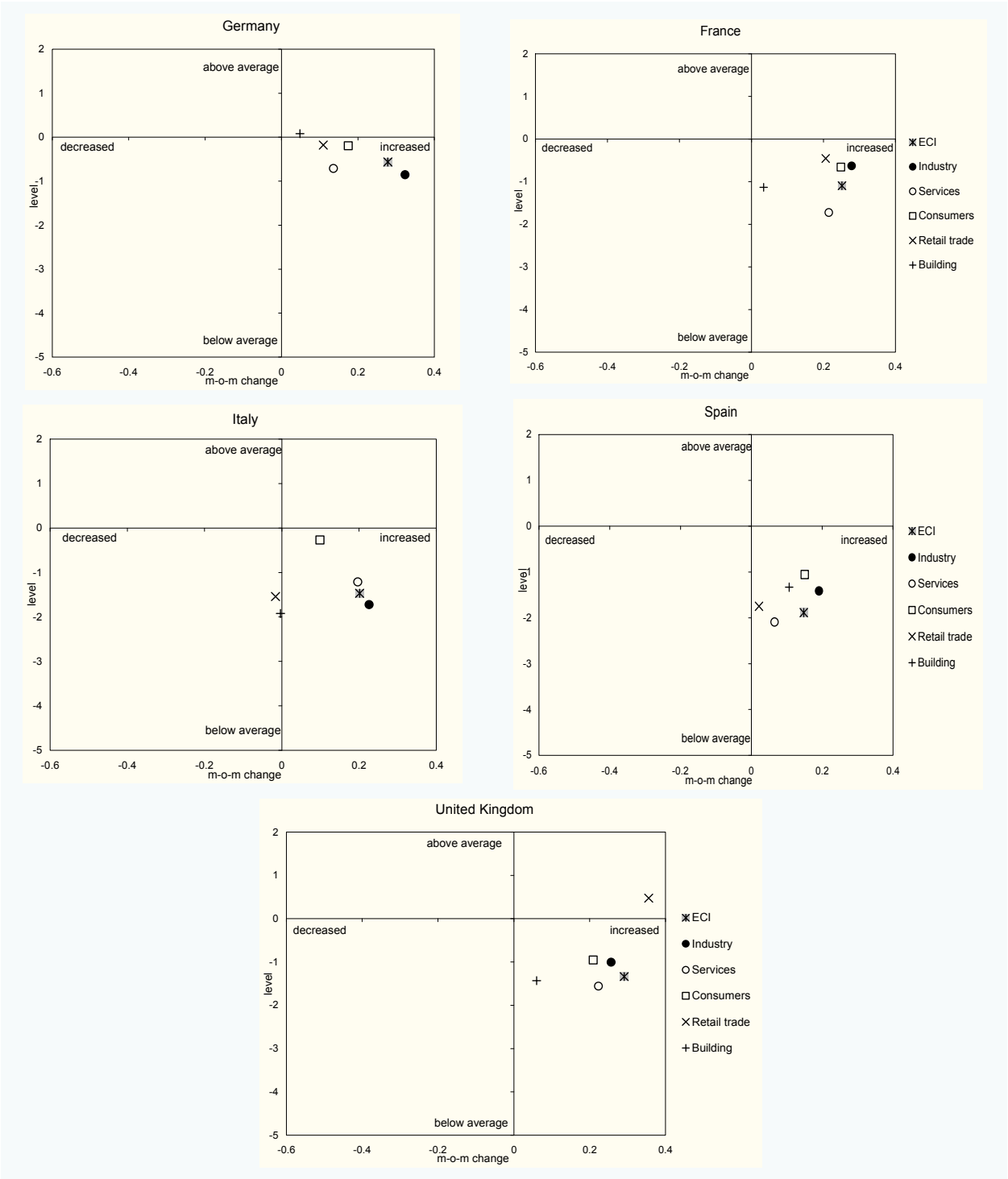
GRAPH 5b: Economic Climate Tracer for the four larger euro area Member States and the UK



Source: European Commission services

Graph 6 shows the cross-section economic climate tracer. Most sectoral climate tracers across all the countries covered are in the upswing quadrant, with the indicators for construction in Germany and for retail trade in UK already in the expansion area. By contrast, in Italy both retail trade and construction remain on the border between contraction and upswing.

GRAPH 6: Cross-section economic climate tracer for the four larger euro area Member States and the UK

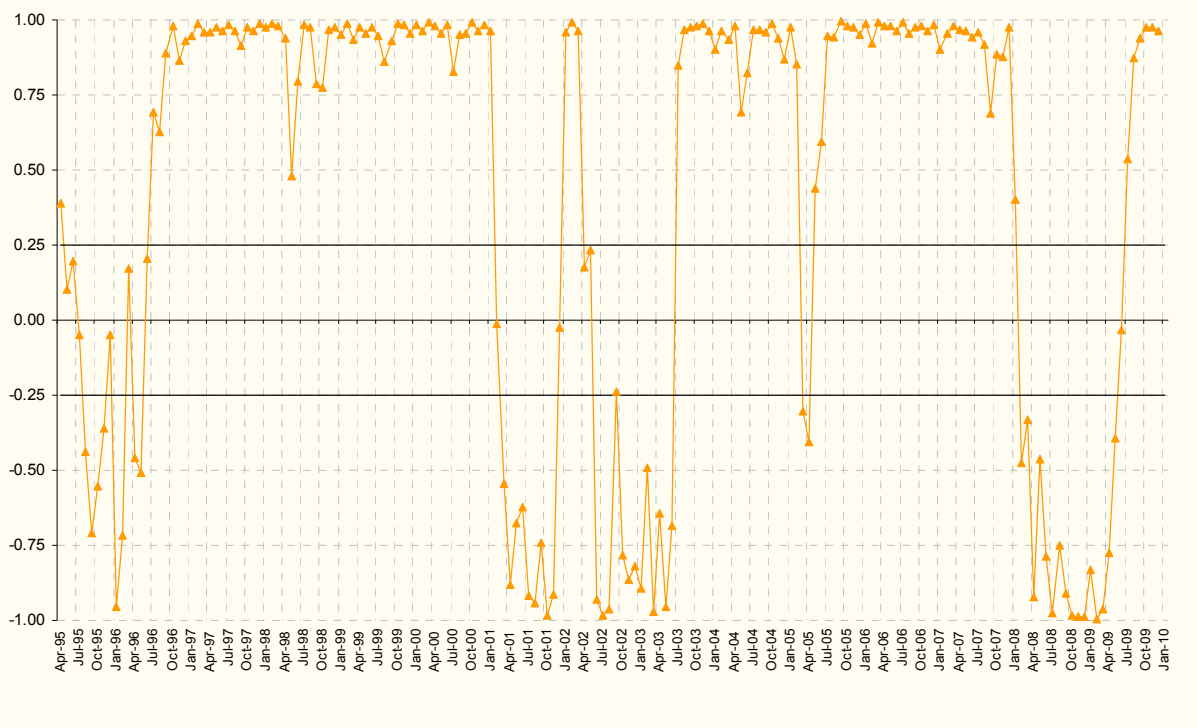


Source: European Commission services

Euro area turning point index

Taking the latest survey data, the Turning Point Index, based on a Markov switching model, estimates the difference between high- and low-regime probabilities at 0.96 in December. This TPI value implies that the cyclical phase is favourable (see Annex 1 for details).

GRAPH 7: Turning Point Index for the euro area



Source: European Commission services

Flash consumer confidence indicator for the EU and euro area

by **Olivier Biau**

This month's special focus presents the results of the feasibility study on publishing the results of the EU and euro area consumer survey in advance of other survey results. The proposed methodology was tested during a period of 12 months and achieved good results, with limited revisions and always consistent signals. Encouraged by the results, DG ECFIN will launch a 'Flash consumer confidence indicator' ('Flash CCI') for the EU and the euro area. The first release is scheduled on 21 January 2010. Final results for January, including the country breakdowns, will be published in the ESI press release (28 January 2010).

Background

An early or 'flash' release of the Consumer Confidence Indicator ahead of the indicators for other sectors offers some important advantages: it is more timely and offers an opportunity to feature in its own right a sector which otherwise tends to be overshadowed. Due to the distinct characteristics of consumer surveys, compilation time is shorter[1], making it possible to bring forward the release date compared with other sectors. However, the methodology has to be robust to allow timely production of the flash estimate even if some country data are missing.

The feasibility study consisted of two parts. First, the best methodology for obtaining reliable advance indicators had to be identified. A number of alternative econometric models for handling missing countries when calculating the EU/euro area aggregate were tested. Based on in-sample exercises, a methodology similar to the one used by Eurostat for its flash estimation procedure for the Monetary Union Index of Consumer Prices (MUICP)[2] was selected. The second part of the study focused on testing the selected methodology in real conditions (out-of-sample exercise).

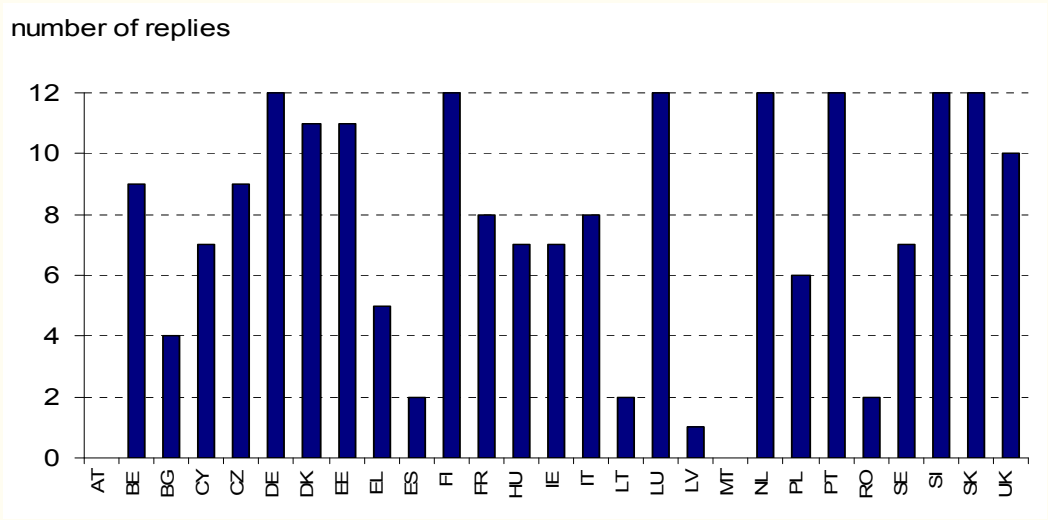
During the testing phase (January to December 2009), statistical institutes, central banks and market research companies participating in the Joint Harmonised EU Programme of Business and Consumer Surveys provided consumer survey data as long as possible in advance of the regular timetable. Unit ECFIN.A3 calculated and internally released an early consumer confidence indicator for the EU and euro area *Flash CCI*. The quality of the *Flash CCI* was assessed by comparing it with the final results based on the full set of countries for each month of 2009.

[1] Sampling does not stumble on the constraint of population size and responses are collected primarily by phone or face to face, using quota sampling most of the time (implying a higher response rate).
[2] Further information can be found in Eurostat News Release 113/2001 of 5 November 2001.

Methodology

The *Flash CCI* for the EU and euro area (EA) is constructed using the data available on the cut-off date. Chart 1 shows the number of replies received by the deadline for each EU Member State (MS) during the test period and Table 1 shows the percentage of the total weights available each month.

Chart 1: Number of replies per MS available by the deadline



Source: European Commission services
Note: from January to December 2009, the maximum number of replies is 12.

Table 1: Percentage of the aggregate available by the deadline

	EU	EA
Jan-09	29.0%	39.1%
Feb-09	29.0%	39.1%
Mar-09	82.2%	74.8%
Apr-09	91.4%	93.5%
May-09	68.1%	65.3%
Jun-09	86.5%	82.8%
Jul-09	65.4%	61.1%
Aug-09	89.4%	85.9%
Sep-09	71.8%	66.7%
Oct-09	88.4%	85.9%
Nov-09	82.5%	79.4%
Dec-09	85.9%	85.9%

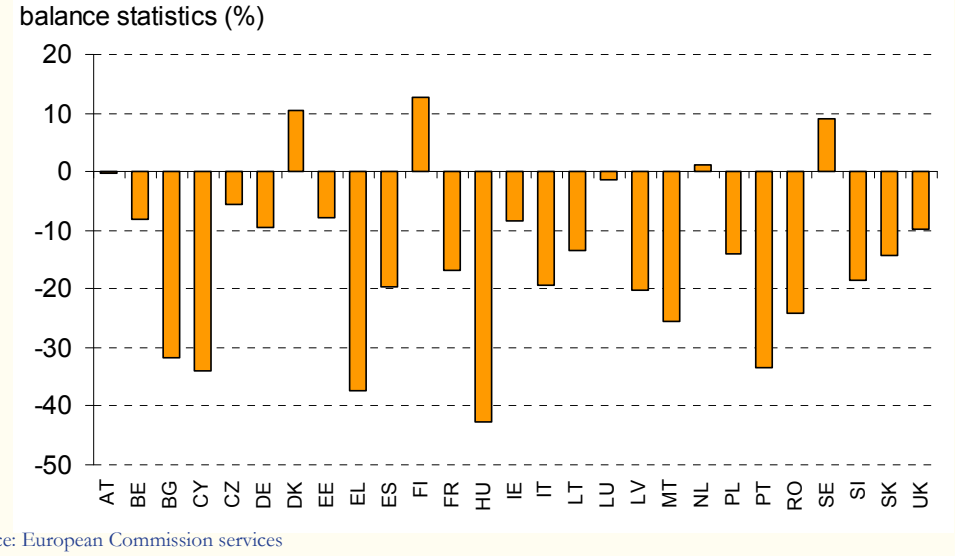
Source: European Commission services
Note: the reference series used to calculate the country-weighted EU and euro area aggregate is the private final consumption expenditure at constant prices.

Since the levels of the Member States' confidence indicators differ widely, it is necessary to take account of this information in the calculations. Chart 2 plots the average level (over 60 months) of the Member States' confidence indicators. Using information about the observed levels minimises the risk of introducing any significant error[3].

[3] Another possibility would be to use a sort of 'bridge model': $CI_{EU/EA} = a + b\ CI_{EU/EA\text{-missing}}$. This linear model explains the CI_{EU} or CI_{EA} by the confidence indicator calculated for a subset of countries (net of missing values,

The method selected treats the missing country data as missing values: missing survey results are replaced by the corresponding confidence indicator (CI) forecasts. The aggregates for the EU (CI_{EU}) and the euro area (CI_{EA}) are calculated as weighted averages of the country confidence indicators, using observed and forecast values.

Chart 2: 60-month average of confidence indicators (January 1985 – December 2009)



Source: European Commission services

Three models that each use different information sets are used to forecast missing values (see Table 2). A simple 'conservative' model, used for all missing countries, imputes the last available observation. An autoregressive (AR) model is used to forecast values for larger missing countries[4] and reflects the dynamics of the confidence indicator modelled with an autoregressive process. The third 'linear model' forecasts the missing confidence indicator using an autoregressive term and also the best donor — an observed confidence indicator for another country available on the deadline. The best donor is selected by a cluster analysis based on the highest correlation observed in the past.

Table 2: Models to forecast the missing values at MS level

Model	Method	Countries concerned
1. Conservative	Xt = Xt-1	All missing countries
2. AR	Xt = a+b.Xt-1+ut	Some missing countries
3. Linear	Xt = a+b.Xt-1 + c.Zt +ut	Some missing countries

Note: Xt is the MS consumer confidence indicator (level, seasonally adjusted) which is not available at time t. This value can be forecast using either its past value (i.e. Xt-1 as in models 1 and 2) or other MS confidence indicators (Zt) available at time t (as in model 3).

All models are re-estimated monthly using fixed-length rolling windows of 60 observations. The choice of using the most recent five years of data only reflects a compromise between having enough observations and not having too many breaks.

$CI_{EU/EA\text{-}missing}$) available on the deadline. Using the estimates of a and b can produce a forecast for the CI_{EU} or CI_{EA} taking as an explanatory variable the $CI_{EU/EA\text{-}missing}$ calculated from the observed data. This method was tested but finally not chosen, because it produced worse results than simple autoregression (AR).

[4] The other missing countries are still forecast using 'conservative' modelling.

Once the missing values have been forecast, estimates for the CI_{EU27} and CI_{EA} are produced as country-weighted averages.

Test results

From January to December 2009, the CI_{EU} and CI_{EA} were calculated using all three models. Table 3 presents the results using the vintage data.

Table 3: Outcomes of the three models during the testing period (January–December 2009)

model 1	Xmissing = X(-1)		observed - forecast		countries forecast
	EU	EA	EU	EA	
Jan-09	-29.6	-31.2	-1.01	0.73	AT BE CY EL ES FR IE IT MT BG CZ HU LT LV PL RO SE UK
Feb-09	-31.0	-31.1	-0.54	-1.33	AT BE CY EL ES FR IE IT MT BG CZ HU LT LV PL RO SE UK
Mar-09	-31.6	-33.5	-0.11	-0.17	AT FR IE MT LT
Apr-09	-28.9	-31.5	0.19	0.16	AT CY EL IE MT LT LV PL RO
May-09	-27.5	-29.9	1.65	1.77	AT CY EL ES IT MT BG CZ EE LT LV PL RO SE
Jun-09	-23.3	-25.7	0.46	0.61	AT EL ES MT LT LV RO
Jul-09	-21.1	-23.4	0.23	0.37	AT EL ES FR MT BG HU LT
Aug-09	-20.1	-22.1	0.09	0.12	AT ES MT BG LT LV
Sep-09	-16.4	-18.7	-0.30	-0.28	AT CY ES IE IT MT BG HU
Oct-09	-15.5	-17.8	0.16	0.16	AT ES MT HU LV RO
Nov-09	-14.9	-17.1	-0.21	-0.21	AT BE EL ES MT BG DK LV RO
Dec-09	-14.7	-16.4	0.24	0.31	AT ES MT BG LT LV RO SE

model 2	Xmissing = AR		observed - forecast		countries forecast with specific modelling
	EU	EA	EU	EA	
Jan-09	-29.6	-30.8	-0.99	0.29	BE FR IT AT UK
Feb-09	-31.4	-30.8	-0.17	-1.65	BE FR IT AT UK
Mar-09	-31.7	-33.7	-0.02	-0.04	FR AT
Apr-09	-28.9	-31.5	0.16	0.16	EL PL AT
May-09	-27.4	-29.9	1.57	1.71	AT EL ES IT PL
Jun-09	-23.3	-25.7	0.46	0.61	AT EL ES
Jul-09	-21.2	-23.3	0.29	0.32	AT EL ES PL FR
Aug-09	-20.1	-22.1	0.09	0.13	AT ES
Sep-09	-16.5	-18.9	-0.22	-0.14	AT ES IT PL
Oct-09	-15.5	-17.8	0.17	0.17	ES AT
Nov-09	-14.9	-17.1	-0.19	-0.19	AT BE ES EL
Dec-09	-14.7	-16.4	0.24	0.32	AT ES

model 3	Xmissing = LM		observed - forecast		countries forecast with specific modelling
	EU	EA	EU	EA	
Jan-09	-30.0	-31.4	-0.58	0.86	BE FR IT AT UK
Feb-09	-32.0	-31.7	0.44	-0.77	BE FR IT AT UK
Mar-09	-32.0	-34.1	0.29	0.41	FR AT
Apr-09	-28.9	-31.4	0.21	0.13	EL PL AT
May-09	-27.3	-29.7	1.53	1.51	AT EL ES IT PL
Jun-09	-23.4	-25.8	0.57	0.78	AT EL ES
Jul-09	-21.3	-23.5	0.38	0.51	AT EL ES PL FR
Aug-09	-20.3	-22.4	0.29	0.42	AT ES
Sep-09	-16.6	-19.0	-0.11	-0.02	AT ES IT PL
Oct-09	-15.4	-17.7	0.11	0.09	ES AT
Nov-09	-14.8	-17.0	-0.27	-0.29	AT BE ES EL
Dec-09	-14.6	-16.3	0.21	0.27	AT ES

Source: European Commission services

It is difficult to establish with any certainty which model outperforms the others and achieves better accuracy, because the comparison is based on only 12 points (one-year testing period). Hence, a simple average of the outcomes of the three models was used to obtain the *Flash CCI*. Table 4 shows the standard evaluation criteria, namely the average of error (AVE), the minimum and maximum absolute error (MIN and MAX), the mean squared error (MSE) and the mean absolute error (MAE).

Table 4: Criteria to test forecast accuracy (EU aggregate)

Model *EU*	AVE	MIN	MAX	MSE	MAE
1	0.05	0.09	1.65	0.38	0.43
2	0.10	0.02	1.57	0.33	0.38
3	0.26	0.11	1.53	0.31	0.42
Flash	*0.15*	*0.05*	*1.58*	*0.32*	*0.38*

Source: European Commission services

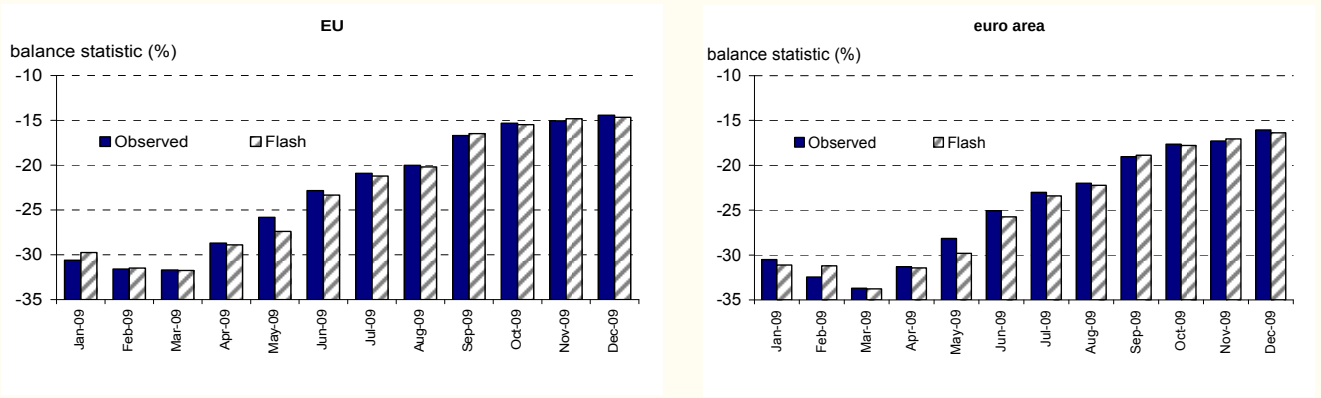
Table 5 and Chart 3 show that, as far as the levels are concerned, the method tested gives a flash estimate of the CI_{EU27} and CI_{EA} with a maximum (absolute) error of 1 point[5]. In other words, if the values are rounded, the error never exceeds 1 point. Moreover, when the percentage of missing countries is low, the errors are almost negligible. Besides, as far as the trend is concerned, the signal given by the *Flash* has always pointed in the right direction.

Table 5: Flash results from January to December 2009

	Flash		**observed**		**observed - forecast**	
	EU	EA	EU	EA	EU	EA
Jan-09	-29.7	-31.1	-30.6	-30.5	-0.86	0.62
Feb-09	-31.5	-31.2	-31.6	-32.5	-0.09	-1.25
Mar-09	-31.8	-33.8	-31.7	-33.7	0.05	0.07
Apr-09	-28.9	-31.5	-28.7	-31.3	0.19	0.15
May-09	-27.4	-29.8	-25.8	-28.1	1.58	1.66
Jun-09	-23.3	-25.7	-22.8	-25.1	0.50	0.67
Jul-09	-21.2	-23.4	-20.9	-23.0	0.30	0.40
Aug-09	-20.2	-22.2	-20.0	-22.0	0.16	0.22
Sep-09	-16.5	-18.9	-16.7	-19.0	-0.21	-0.15
Oct-09	-15.5	-17.8	-15.3	-17.7	0.15	0.14
Nov-09	-14.8	-17.1	-15.1	-17.3	-0.23	-0.23
Dec-09	-14.7	-16.4	-14.4	-16.1	0.23	0.30

Source: European Commission services

Chart 3: Consumer Confidence Indicator — Flash vs. observed



Source: European Commission services

[5] In May 2009, the higher error can be explained by the change of partner institute for the consumer surveys in Spain which may have caused a break in the series.

Launch of the *Flash CCI*

The results of this feasibility study (presented at the 2009 EC Workshop on Business and Consumer Surveys[6]) demonstrate that it is possible to release a *Flash CCI* roughly one week before the ESI press release. The proposed method achieves good results, with limited revisions and always consistent signals. In order to ensure good quality, institutes have been consulted and agreed with the 2010 schedule (see Table 6).

Encouraged by the results, DG ECFIN will launch its Flash Consumer Confidence Indicator for the EU and the euro area. The first release is scheduled on 21 January 2010. Final results for January, including the country breakdowns, will be published in the ESI press release (28 January 2010). Early release of consumer confidence estimates will increase the visibility of the consumer survey, without losing quality. Besides this, confidence among consumers will be one of the first monthly growth cycle indicators available for the EU and the euro area.

Table 6: 2010 schedule

2010	Deadline for early delivery of results	
January	Thu	21-Jan-10
February	Thu	18-Feb-10
March	Mon	22-Mar-10
April	Thu	22-Apr-10
May	Thu	20-May-10
June	Tue	22-Jun-10
July	Thu	22-Jul-10
August	Mon	23-Aug-10
September	Wed	22-Sep-10
October	Thu	21-Oct-10
November	Mon	22-Nov-10
December	Mon	20-Dec-10

[6] http://ec.europa.eu/economy_finance/db_indicators/surveys/workshops_doc/index_en.htm.

Reference series

The reference series are from Eurostat, via Ecowin:

Confidence indicators	Reference series (volume/year-on-year growth rates)
Total economy (ESI)	GDP, seasonally- and calendar-adjusted
Industry	Industrial production, working-day-adjusted
Services	Gross value added for the private services sector, seasonally- and calendar-adjusted
Consumption	Household and NPISH final consumption expenditure, seasonally- and calendar-adjusted
Retail	Household and NPISH final consumption expenditure, seasonally- and calendar-adjusted
Building	Production index for building and civil engineering, trend-cycle component

Note: Monthly data are obtained by linear interpolation of quarterly data.

Economic Sentiment Indicator

The economic sentiment indicator (ESI) is a weighted average of the balances of selected questions addressed to firms and consumers in five sectors covered by the EU Business and Consumer Surveys Programme. The sectors covered are industry (weight 40%), services (30%), consumers (20%), retail (5%) and construction (5%).

Balances are constructed as the difference between the percentages of respondents giving positive and negative replies. The Commission calculates EU and euro area aggregates on the basis of the national results and seasonally adjusts the balance series. The indicator is scaled to have a long-term mean of 100 and a standard deviation of 10. Thus, values greater than 100 indicate above-average economic sentiment and vice-versa. Further details on construction of the ESI can be found at:
http://ec.europa.eu/economy_finance/db_indicators/surveys/method_guides/index_en.htm
Long time series of the ESI and confidence indicators are available at:
http://ec.europa.eu/economy_finance/db_indicators/surveys/time_series/index_en.htm.

Economic Climate Tracer

The economic climate tracer is a two-step procedure. The first consists of building economic climate indicators. They are based on principal component (PC) analyses of balance series (s.a.) from the surveys conducted in industry, services, building, retail trade and among consumers. In the case of industry, five of the monthly questions in the industry survey are used as input variables (employment and selling-price expectations are excluded). For the other sectors the number of input series is: services: all five monthly questions; consumers: nine questions (price-related questions and the question about the current financial situation are excluded); retail: all five monthly questions; building: all four monthly questions. In the case of the euro area, the first principal component explains between 65% (retail) and 92% (industry) of the variance of the input balance series in question.

The economic climate indicator (ECI) is a weighted average of the five PC-based sector climate indicators. The sector weights equal those underlying the economic sentiment indicator (ESI), i.e. industry 40%; services 30%; consumers 20%; building 5%; and retail trade 5%. The weights were allocated broadly on the basis of two criteria: the representativeness of the sector in question and historical tracking performance vis-à-vis GDP growth.

In the second step of the procedure, all climate indicators are smoothed using the HP filter in order to eliminate short-term fluctuations of a period of less than 18 months. The smoothed series are then standardised to a common mean of zero and standard deviation of one. The resulting series are plotted against their first differences. The four quadrants of the graph, corresponding to the four business cycle phases, are crossed in an anti-clockwise movement. The phases can be described as: above average and increasing (top right, 'expansion'), above average but decreasing (top left, 'downswing'), below average and decreasing (bottom left, 'contraction') and below average but increasing (bottom right, 'upswing'). Cyclical peaks are positioned in the top centre of the graph and troughs in the bottom centre.

Markov Switching Turning Point Index

The turning point index model, based on the work of Grégoir and Lenglart (2000)[7], aims at identifying economic growth trends in the euro area, using as input all the confidence indicators derived from the surveys of industry, services, building, retail trade and consumers. This model is symmetric in signalling turning points. TPI values within the ± 0.25 range imply stabilisation, when the pace of activity is around its potential (the signals received are very varied and indicate no clear-cut upward or downward movement). The economy is performing a soft landing or soft take-off, depending whether the previous period was marked by acceleration or deceleration. By contrast, the signal is very consistent when TPI values draw very close to or reach ± 1: the cyclical phase is deemed to be clearly favourable or unfavourable; economic activity is in a period of sharp acceleration (or sharp deceleration or even contraction).

[7] Grégoir, S. and Lenglart, F. (2000), 'Measuring the probability of a business cycle turning point by using a multivariate qualitative hidden Markov model', Journal of Forecasting, 19.