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# European *Business Cycle* indicators

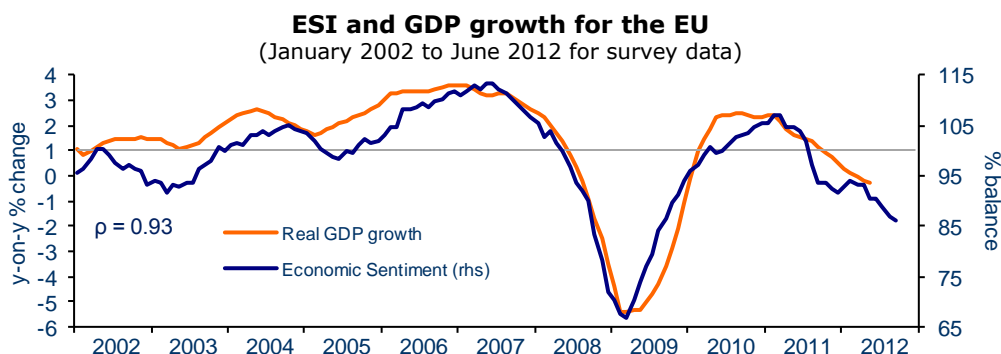
SHORT - TERM ANALYSIS FROM EUROPEAN COMMISSION'S DIRECTORATE GENERAL FOR ECONOMIC AND FINANCIAL AFFAIRS

## Developments in business and consumer survey data in 2012Q3

- In the third quarter of 2012, economic sentiment continued to decline in both the EU and the euro area.
- The decline was widespread among EU Member States and reflects a broad-based deterioration across sectors, including in consumer sentiment.
- Overall, developments in survey data suggest a deterioration of economic activity in 2012Q3.

## Highlight: Tracking GDP growth with composite survey indicators: a fresh look at the ESI's performance

The Economic Sentiment Indicator (ESI) is a relevant tool for policy-makers and economic analysts to keep track of the European economy, providing persistently high coincident and leading correlations with GDP growth. Striving to render the ESI even more reliable in tracking GDP, the highlight section tests two alternative new construction methods, which differ from the current practice only in respect of the survey questions to be included in the composite index. An alternative index based on best performing component series in terms of correlation marginally outperforms the ESI in both coincident and leading correlation with GDP growth, while an index based exclusively on forward-looking components achieves somewhat more marked improvements, but only in leading correlation. While the room for improving the ESI seems to be rather limited overall, particularly the forward-looking index could be a promising option to be explored further, given the high interest of policy makers and economic analysts in leading indicators.



Note 1: The horizontal line (rhs) marks the long-term average (=100) of the sentiment indicator.

Note 2: Both ESI and GDP series are plotted at monthly frequency. Monthly GDP 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 quarterly.*

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## 1. Recent developments in survey indicators for the EU and the euro area

In the third quarter of 2012, the Economic Sentiment Indicator (ESI) continued to decrease in both the EU and the euro area. In September, the ESI was well below its long-term average in both areas, at 86.1 in the EU (4.3 points lower than in June 2012) and 85.0 in the euro area (4.9 points lower than in June). The ESI has been below its long term average since August 2011. The worsening in sentiment observed in the third quarter was widespread among EU Member States and reflects a broad-based deterioration across sectors.

Sentiment in *industry* deteriorated by 2.5 points in the EU and by 3.3 in the euro area over the third quarter. However, in the last month of the quarter the indicator remained broadly stable compared with August in the EU and decreased at a lower pace than in July and August in the euro area. On a quarterly basis the industrial confidence indicator decreased in the majority of the EU Member States and in all seven largest Member States, except in the UK where it improved slightly. However, the monthly profile of 2012Q3 shows some improvements in September in Spain, France and the UK.

In both the EU and the euro area, the decline in the industrial confidence indicator in the third quarter results from a deterioration in all three components (production expectations, assessment of order books and stocks of finished products). Similarly, managers' assessment of production trends observed during recent months, export order books and employment prospects (three variables which are not included in the industrial confidence indicator) deteriorated sharply over the third quarter. Selling price expectations are at a lower level than in the second quarter but have increased in August and September. Some positive signs came from a slightly improved assessment of order books in the EU and the level of stocks in the euro area in September.

Quarterly survey data published in July 2012 shows that capacity utilisation decreased markedly in both regions. At 78.2% in the EU and 77.8% in the euro area, capacity utilisation fell further below its long-term average of 81.0% and 81.4%, respectively. Strong heterogeneity in capacity utilisation persists among Member States. In Germany, capacity utilisation fell below its long-term average for the first time since end-2010, to 82.6%.

During 2012Q3, sentiment in *services* worsened sharply in both the EU and the euro area. In both regions, the indicator dropped further below its long-term average throughout the third quarter. The quarterly losses in confidence resulted from a sharp deterioration in all the components (past and expected demand and past business situation).

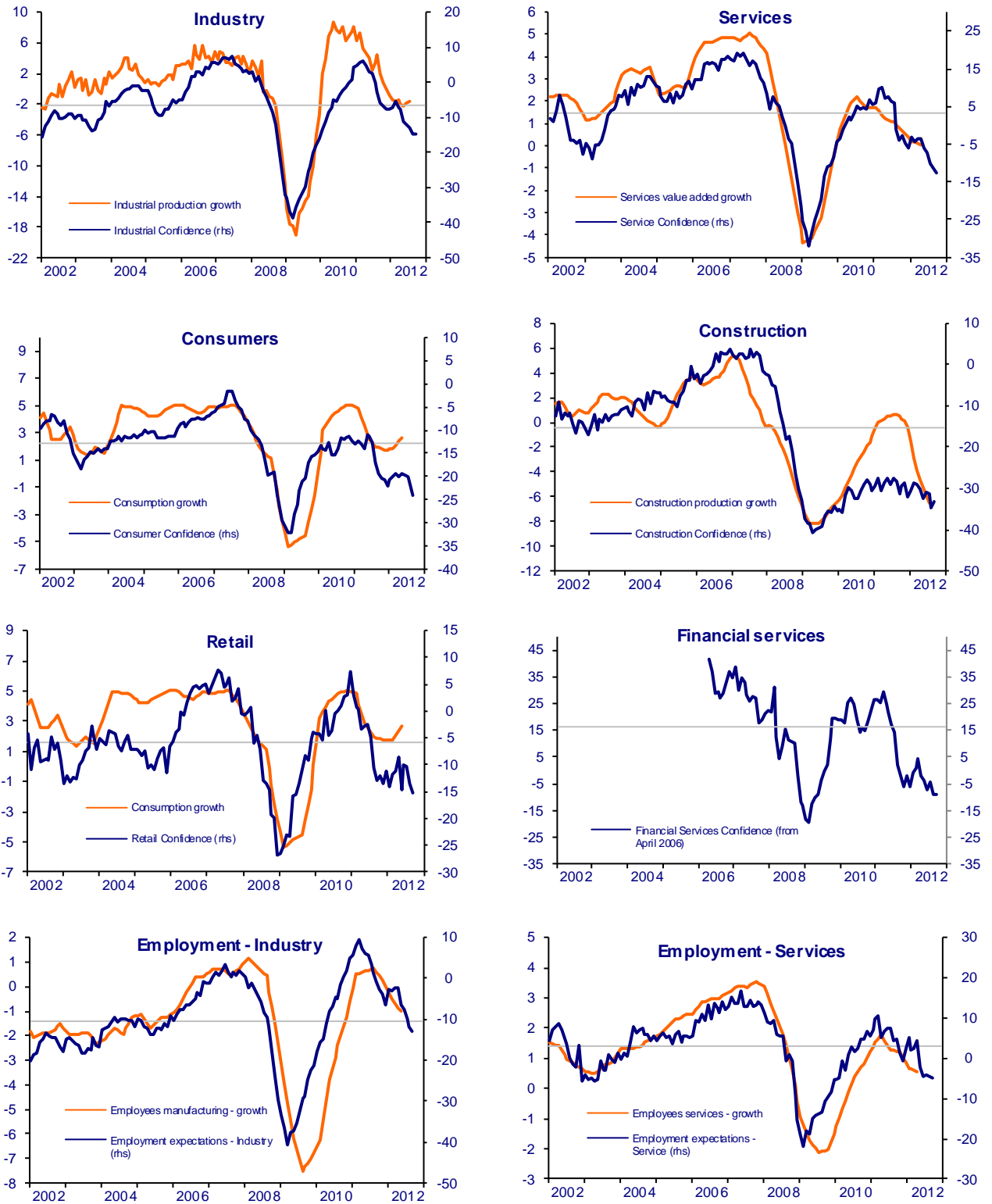
Developments in the confidence indicator were somewhat mixed across countries. Among the seven largest Member States, rather strong decreases were registered in Germany, France, Spain and the UK. Albeit less strongly, sentiment in services decreased also in Italy, Poland and the Netherlands. In September, however, the German, Dutch and UK services confidence indicators stabilised.

On average, the *retail trade* confidence indicator decreased during the third quarter in the EU and the euro area compared to the second quarter. In both areas, the decline over the third quarter was due to a deterioration of managers' appraisal of past and expected business activity. Meanwhile, managers' assessment of the current level of stocks followed a rather volatile monthly path and, all in all, remained broadly stable compared with the second quarter.

Sentiment in *construction* deteriorated over the third quarter but rebounded somewhat in September thanks to a pick-up in employment expectations. By contrast, managers' appraisal of current order books declined over the quarter in both regions. While over the last two to three years confidence in the construction sector oscillated around a rather low level, a moderate downward trend is discernible over the past few quarters. Among the largest Member States, construction confidence clearly deteriorated in France, the Netherlands and Poland, while the indicator was more volatile in Spain and remained broadly stable in Italy and Germany. On the contrary, confidence in the construction sector improved in the UK.

Following its stabilisation over the second quarter, confidence among *consumers* also deteriorated during the third quarter in both the EU and the euro area. In September, the indicator stood well below its long-term average. In both regions, the decline reflects a worsening in all the components of the indicator. Consumer expectations about their financial situation, savings and the general economic situation worsened over the quarter. Also consumers' unemployment fears picked up during the third quarter. Although not included in the consumer confidence indicator, consumers' assessment of their past financial situation and their assessment of the past general economic situation worsened as well, while their intentions to spend more money on big-item purchases remained broadly unchanged in the EU and declined slightly in the euro area.

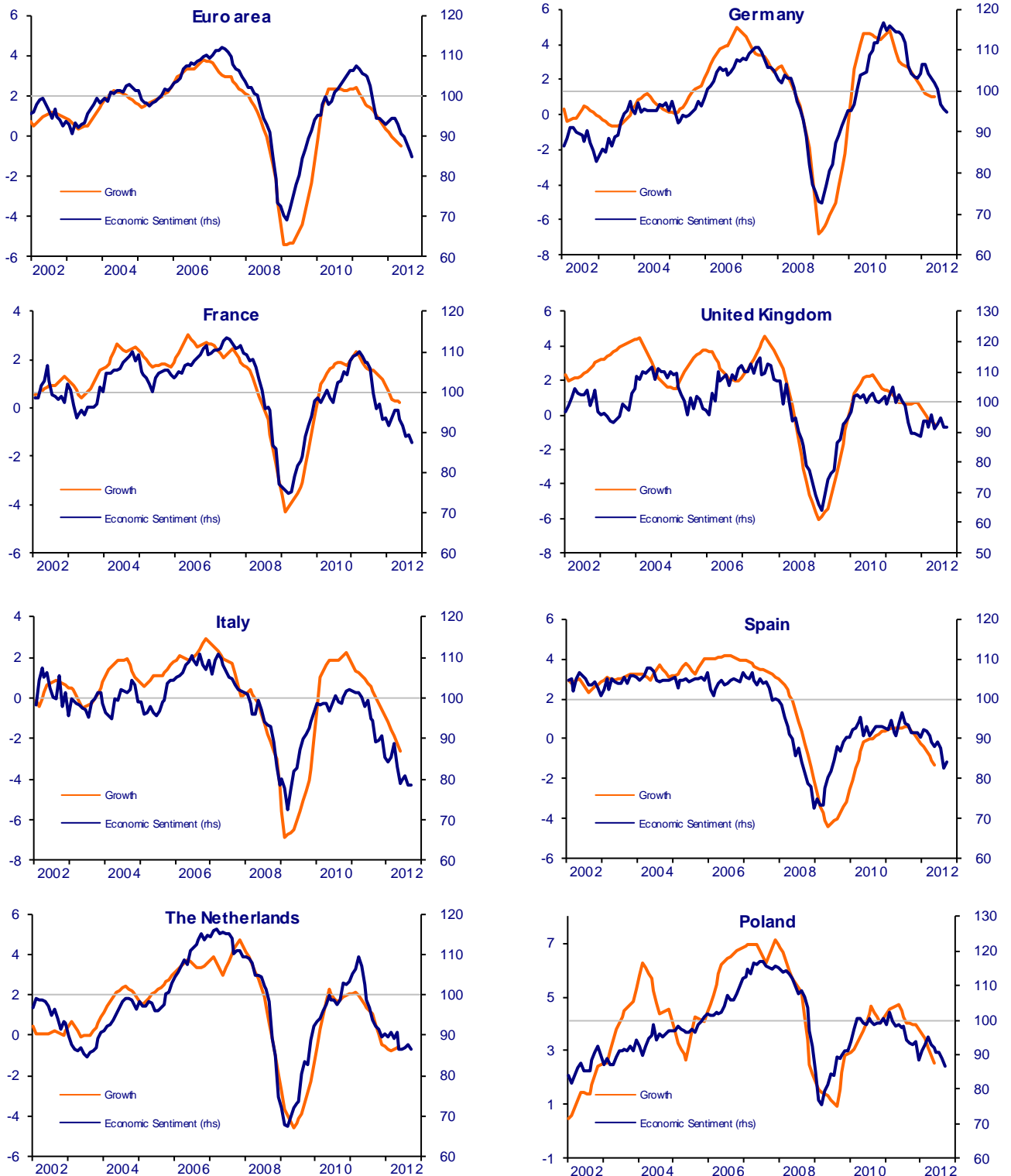
Graph 1.1: Sectoral confidence indicators and reference series for the EU (January 2002 to September 2012 for survey data)



Note 1: The horizontal line (rhs) marks the long-term average of the survey indicators.

Note 2: Confidence indicators are expressed in balances of opinion and hard data in y-o-y changes. If necessary, monthly frequency is obtained by linear interpolation of quarterly data.

Graph 1.2: **Economic Sentiment Indicator — Selected EU Member States**  
(January 2002 to September 2012 for survey data)



Note 1: The horizontal line marks the long-term average (=100) of the sentiment indicator.

Note 2: Confidence indicators are expressed in balances of opinion and GDP in y-o-y changes. Both variables are plotted at monthly frequency. Monthly GDP data are obtained by linear interpolation of quarterly data.

Confidence in *financial services* – which is not included in the ESI – decreased in the third quarter of 2012 in the EU while it remained broadly stable in the euro area. In the EU the fall in confidence was due mainly to a marked decline in the assessment of the past business situation and past demand, while managers' demand expectations showed no clear trend over the quarter. In the euro area, the decline in managers' assessment of past business situation was offset by an increase in demand expectations. Meanwhile, managers' assessment of past demand in the euro area remained broadly unchanged in the third quarter compared with the second.

The developments over the third quarter are confirmed by the evolution of the turning point indicator and the climate tracers. The economic climate tracers for both the EU and the euro area moved deeper into the contraction quadrant in September 2012 (see Annex 1 for further details). Moreover, the turning point indicator for the euro area – which extracts the (positive or negative) surprises from new available survey data – remained in negative territory, signalling a continuously unfavourable cyclical phase for the euro-area economy (see Annex 2 for further details). In September, the turning point indicator worsened marginally compared to August, remaining clearly in negative territory and close to -1.

## 2. Recent developments in selected Member States

During 2012Q3, the ESI decreased in all the seven largest Member States, most significantly in Germany, followed by France, Spain, Poland, Italy, the Netherlands and the UK. Following the steep decrease in Germany, the ESI is now below its long-term average in all the largest Member States.

Economic sentiment in **Germany** continued the downward trend that started in March 2012 after the mild recovery around the turn of the year. The ESI has been below its long-term average of 100 since July and currently stands at 94.4. The negative evolution reflects a worsening confidence in all sectors but construction, which remained broadly unchanged compared with the second quarter. The monthly evolution shows some positive signs in the services sector, where the confidence indicator picked-up in September mainly thanks to an improvement in managers' assessment of their past business situation. By contrast, confidence in the manufacturing sector worsened continuously and markedly in the third quarter, reflecting a deterioration in all the components (assessment of order books, the adequacy of the level of stocks of finished products and future production). Also confidence among consumers, which had held up quite well previously, declined strongly in the third quarter. Consumers became more pessimistic about the future general economic situation, their future

financial position, unemployment expectations and about their future savings. By contrast, consumers' assessment of their own past financial situation and current savings – which are not included in the confidence indicator – remained broadly unchanged compared with the second quarter.

In **France**, the ESI deteriorated further over the third quarter and now stands at 87.6, well below its long-term average. At the sector level, the picture is mixed with confidence declining sharply in services, construction and among consumers, and showing no clear direction in retail trade. In Industry, the indicator remained broadly stable in July and August and improved slightly in September. This development results from a more optimistic assessment of the level of order books and stocks, while managers' production expectations deteriorated. The services confidence indicator deteriorated mainly due to plummeting assessments of the past business situation and past demand. Demand expectations followed a more volatile path around the very low level reached in June. In the construction sector, lower confidence resulted from a sharp deterioration in employment expectations throughout the quarter and worsened assessments of order books. Consumers became more pessimistic mainly about their future financial position and the general economic situation, while their views on envisaged savings and unemployment expectations became somewhat less pessimistic in September.

Based on quarterly averages, the ESI slightly decreased in **the United Kingdom** in the third quarter, in the context of a rather volatile monthly profile. Increasing sentiment in July and September alternated with the fall in August. The volatile profile reflects ups and downs registered in the industry and services sectors. Confidence rebounded in the construction sector thanks to an improvement in managers' assessment of past activity and their expectations about their firms' employment. Consumer confidence improved in the third quarter compared with the second. However, the monthly profile shows that the indicator improved markedly in July but decreased in August and September. Over the last two months, consumers revised down their expectations about their financial situation, their savings and the general economic situation, while their unemployment expectations eased throughout the quarter. After increases in June and July, confidence in retail trade fell back sharply in August and September.

In **Italy**, the ESI registered a further decrease in the third quarter compared with the second. At sectoral level, a downward trend is discernible in confidence in services, retail trade and among consumers. Concerning the latter indicator, a strong increase in July was partly offset in August and September. By contrast, confidence remained broadly stable over the quarter in industry and construction. In industry,



worsened production expectations and more negative assessments of order books were compensated by an improved assessment of the current level of stocks. For services, the deterioration in the third quarter reflects a decline in all three components of the confidence indicator. Consumers' expectations about their financial situation and savings declined slightly while their unemployment fears remained broadly unchanged. By contrast consumers' expectations about the general economic situation improved strongly over the quarter. Confidence in retail trade declined over the quarter but improved in September thanks to an important increase in managers' expectations about their future business activity.

In **Spain**, economic sentiment deteriorated in the third quarter with all sectors witnessing losses in confidence. The September readings showed some positive signs in industry, construction and among consumers. The decrease in confidence in industry in July and August and the following rebound in September results from similar developments at component level. The strong decline in confidence in services also reflects a rather homogeneous pattern at component level, with a particularly marked decrease in managers' assessment of past demand. The monthly profile shows that the worsening in consumer confidence was particularly severe in August and was only partially offset by a minor improvement in September. The same pattern can be seen at component level apart from consumers' savings expectations that continued to worsen in September.

In **the Netherlands**, economic sentiment was at a lower level in the third quarter compared with the second quarter but remained broadly stable within the quarter. Downward trends were observed for confidence in industry, retail trade and construction, while confidence remained broadly stable in services and improved among consumers thanks to more optimistic views on the future general economic situation and unemployment developments.

In **Poland**, economic sentiment deteriorated constantly over the third quarter. Confidence fell sharply across all business sectors and, following a short-lived pick-up in July, also among consumers. The profile of consumer confidence was determined by corresponding developments in the assessment of the general economic situation and the development of unemployment. At the same time, consumers' expectations about their financial situation remained broadly stable and their savings expectations improved slightly.

### 3. Highlight: Tracking GDP growth with composite survey indicators: a fresh look at the ESI's performance

The roots of the Joint Harmonised EU Programme of Business and Consumer Surveys (BCS) date back to the year 1962, when for the first time a harmonised business survey was conducted in several European states. Since then, the scope of the EU BCS has increased both geographically and in terms of the economic sectors covered. Today, the EU BCS encompasses all 27 Member States (plus one acceding and three candidate countries) and covers industry, services, construction, retail trade and consumers<sup>1</sup>. The broad geographical and sectoral scope of the survey, in connection with the ambition to produce high-quality data, translates into large sample sizes: Every month, some 40,000 consumers and 130,000 firms from across the EU are participating in the survey. The questions posed to firms refer to their past, current and future business activity (level of production, order books, etc.), while the consumer survey interrogates consumers' past, current and future financial situation, as well as their assessment of general economic variables. Overall, the survey contains 36 monthly questions<sup>2</sup>.

While the sheer amount of questions asked makes the EU BCS a particularly rich source of information, there is a need to provide "the big picture" of how the Union's economy is running. Aiming to cater for the need for a broad, easy-to-interpret measure of economic performance, the European Commission has developed the monthly Economic Sentiment Indicator (ESI). Its ingredients are the "balances" (= percentage of positive replies minus percentage of negative replies) of two to four questions per economic sector, which are deemed particularly useful for gauging the economic performance of the respective sector. The ESI is essentially an average of those balances, the only specificity being that the balance scores are standardised before inclusion in the ESI and that explicit weights are allocated to the different sectors<sup>3</sup>. While the standardisation is intended to avoid more volatile balance series from dominating the ESI's behaviour, the weighting takes account of the different relative contributions of the economic sectors to GDP<sup>4</sup>. For ease of interpretation,

<sup>1</sup> A separate survey in the financial services sector has been conducted since 2007. Its results are, however, not included in the construction of the ESI, given the comparably short time series.

<sup>2</sup> Moreover, there are a number of quarterly questions in all sectors except for retail.

<sup>3</sup> For a more detailed description of the ESI-calculation, see European Economy Special report under the following link: [http://ec.europa.eu/economy\\_finance/publications/publication7568\\_en.pdf](http://ec.europa.eu/economy_finance/publications/publication7568_en.pdf)

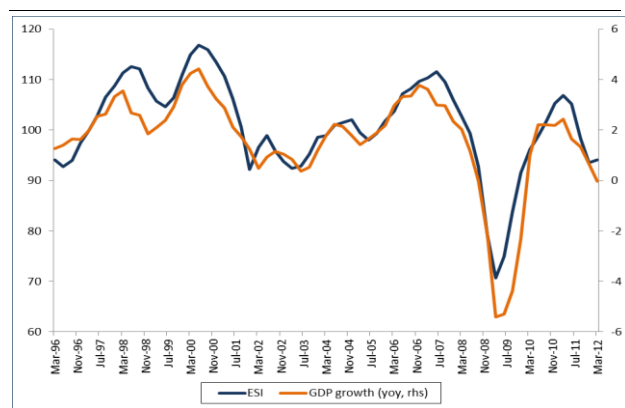
<sup>4</sup> It should be noted that the ESI weighting regime also reflects i) the relative importance of different economic sectors as driving forces of the business cycle and ii)

the final ESI is rescaled to have a long-term mean of 100 and a standard deviation of 10, which translates into values around 100 indicating a neutral economic climate and values below 90 / above 110 a markedly (un)favourable one<sup>5</sup>. This being said it is important to note that in analysing any confidence or sentiment index, it is most important to determine the trend of the index over several months.

This section takes a closer look at how well the ESI allows to track euro area GDP growth. Following that analysis, two alternative designs of the ESI are presented and their GDP tracking performances compared. The alternative designs are limited to selecting a different set of questions for inclusion in the indicator.

Graph 1 gives a first impression of the ESI's tracking performance of GDP growth. The latter is expressed in quarterly year-on-year changes, while the ESI is reported in quarterly levels. It becomes readily apparent that the ESI mimics the up- and downswings of GDP growth with a high degree of precision. Those findings are bolstered by a coincident correlation of 0.92 (see Table 1).

Graph 1: **ESI and GDP growth; euro-area (1996Q1 - 2012Q1)**



Note: monthly BCS data are converted into quarterly by averaging the balances over 3 months. GDP figures refer to y-o-y changes. Source: Commission services.

Graph 1 furthermore shows that the ESI captures the economic turning-points quite well: There is one turning-point, which the ESI reports coincidentally (downturn of 2000Q3), and there are a number of incidences where the ESI signals turning-points

differences among sectors as to how well their balance series track GDP (with better performing sectors receiving higher weights).

<sup>5</sup> Assuming normality, two thirds of the distribution are to be expected within a range of one standard deviation around the mean value.

before they actually materialise (e.g. upswings of 2002Q2 and 2009Q3). However, in some cases the ESI displays a slightly lagging behaviour (e.g. the downturns of 1998Q2 and 2007Q1). Bearing in mind this visual inspection, a value of 0.87 for the leading correlation of the ESI with GDP growth is conclusive: the ESI has clear leading properties, but those are not as pronounced as its ability to track GDP growth coincidentally. However, it should be noted that, given a publication delay in quarterly GDP figures of ca. 45 days, the ability to track GDP coincidentally implies a corresponding information lead of survey-based indicators.

Against the backdrop of this satisfactory tracking record of the ESI, its improvement is likely to prove difficult. However, the results suggest that some potential for improvement rests in tuning the leading properties of the ESI.

In the following, we present two different ways of reconstructing the ESI and embark upon a first, preliminary assessment of their merits. Both designs will differ from the original ESI only in respect of their constituent balances. The first design proposed aims to optimise the leading properties of the ESI. Taking a look at the questions that make up the current ESI, it turns out that three out of 15 questions used for the ESI construction actually refer to the past<sup>6</sup> and four of them to the current situation<sup>7</sup>. This suggests testing a design where only forward-looking questions are included in the ESI. For selecting the forward-looking questions, we resort to the entire 36 monthly questions of the EU BCS. As a principle, we exclude all questions referring to firms' expected selling prices and their expected employment, the reason being that the former variable is hard to interpret (price rises might indicate economic booms, but also rising input costs) and the latter is usually regarded as a lagging indicator due to strict dismissal laws, labour hoarding, etc. Furthermore, we choose to exclude consumers' expectations about future levels of unemployment, on the same grounds as mentioned above, and of their savings, since a rise in the latter can be the result of both rising wages or mounting concerns about the future. Finally, we opt for inclusion of a question on the current level of order books in construction, since there is no explicit forward-looking question for that sector available. It can be argued

<sup>6</sup> Those are questions regarding the business situation and turnover over the past 3 months in services and regarding sales over the past 3 months in the retail sector.

<sup>7</sup> Those questions survey the level of order books in industry and construction, as well as the stock of (finished) products in industry and retail.

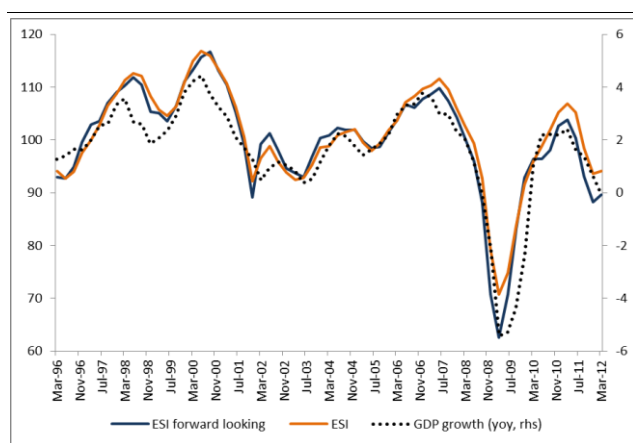


that the level of current orders determines future output, such that there is an implicit forward-looking character of the question. The essence of this "selection procedure" is a set of 6 forward-looking questions, with at least one question per economic sector:

- production expectations in industry
- expected demand in services
- current order books in construction
- expected business situation in retail
- consumers' expected financial position
- consumers' expected general economic situation.

Sticking to the current weighting scheme at the sector level, we recalculate the new forward-looking version of the ESI and plot it (see Graph 2). While superficial inspection confirms that both indicators follow a similar pattern and keep a close grip of GDP, the new design shows a slightly better leading behaviour.

Graph 2: **ESI, alternative ESI (forward looking) and GDP; euro-area (1996Q1 - 2012Q1)**



Note: monthly BCS data are converted into quarterly by averaging the balances over 3 months. GDP figures refer to y-o-y changes. Source: Commission services.

The upswing beginning in 2009Q3, which both indicators signal in 2009Q2 already, is indicated by a steeper slope of the alternative ESI compared to the current one, which is more in line with the steepness of the actual GDP line. In a similar vein, the alternative version of the ESI does indicate – with a lead of one quarter – that the spike in GDP comes to a halt in 2010Q3. The current ESI shows the first indications of plummeting GDP growth only in 2011Q2.

Against the backdrop of those observations, the reported coefficients for coincident and leading correlation of the alternative ESI with GDP growth are in line with expectations: the coincident correlation remains virtually unchanged compared to the current ESI (0.91 compared to 0.92), while the

leading correlation is driven up somewhat (0.92 instead of 0.87).

Table 1: **Correlations of ESI and alternative ESIs with GDP growth (yoy)**

|                               | Coincident correlation | Leading correlation |
|-------------------------------|------------------------|---------------------|
| ESI                           | 0.92                   | 0.87                |
| Alternative ESI (fwd-looking) | 0.91                   | 0.92                |
| Alternative ESI (version 2)   | 0.94                   | 0.90                |

Note: correlation coefficients are computed over the period 1996Q1 – 2012Q1; coincident correlation is computed using current quarter values for both survey and hard data while for the leading correlation the hard data is shifted one quarter ahead.

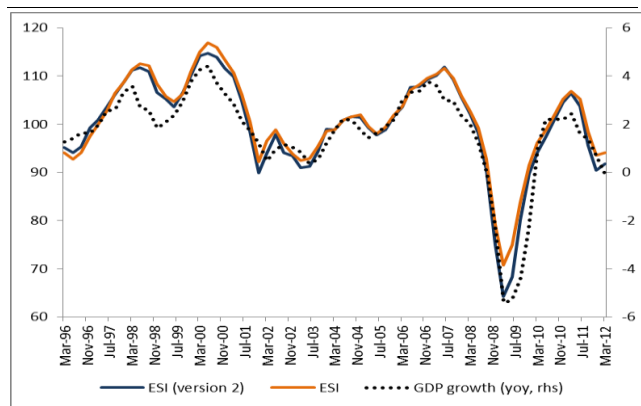
While the first version for an alternative ESI is, by construction, attempting to unleash the ESI's potential as a leading indicator, the second version we test is more agnostic as to where the improvement will materialise (coincident and/or leading properties). Noting that the set of balance series constituting the current ESI is not identical to the set of balance series displaying the highest correlations with GDP, the second version for an alternative ESI consists of including only those best-performing series in the construction of the indicator. Eager to preserve the nature of the ESI as a broad, cross-sector measure of economic activity, we choose the best performing balance series under the condition that there shall be two series per economic sector. The approach results in the following questions taken into account:

- past production in industry\*
- production expectations in industry
- past demand in services
- expected demand in services
- consumers' perception of past economic situation\*
- consumers' expected general economic situation
- expected orders placed with suppliers in retail\*
- expected sales in retail
- past building activity in construction\*
- current order books in construction.

Comparing the selection of the above questions to the ones included in the ESI, it turns out that four of them (marked with an asterisk) are actually new to the ESI. At the same time, the questions are a mix of questions focussing on the past, current and future situation. Taken together, those two properties let us expect that the behaviour of that alternative ESI will be (at least slightly) deviating from both the current ESI and the forward-looking ESI discussed above.

A look into Graph 3 shows that the current ESI and the alternative one under investigation are very similar.

Graph 3: **ESI, alternative ESI (version 2) and GDP; euro-area (1996Q1 - 2012Q1)**



Note: monthly BCS data are converted into quarterly by averaging the balances over 3 months. GDP figures refer to y-o-y changes. Source: Commission services.

The main clearly discernible difference is that the amplitude of the downswing starting in 2007Q2 is larger in case of the alternative version of the ESI. An important difference compared to the forward looking ESI discussed above is that visual inspection does not indicate any improved leading properties compared to the current ESI.

Taking a look at the correlations reported in Table 1, we see that the alternative version of the ESI slightly improves the coincident and leading correlation compared to the current ESI. In direct comparison to the forward-looking ESI, it achieves a slightly higher coincident correlation, but fails to attain the same leading properties.

## Conclusion

The Economic Sentiment Indicator is a relevant tool for policy-makers and economic analysts to keep track of the European economy, providing both persistently high coincident and leading correlations with GDP growth as well as an easy to grasp calculation, which facilitates an intuitive interpretation of the results. Striving to render the ESI even more reliable in tracking GDP, we have tested two alternative new construction methods, which differ from the current practice only in respect of the survey questions to be included in the construction. The first approach was to investigate whether including only forward-looking questions in the ESI would increase its (especially leading) correlation with GDP growth. The second approach shed light on the merits of an ESI constructed from questions selected solely on the basis of the size of their correlation with GDP.

Overall, the room for improvement of the ESI seems to be rather limited. While the ESI based on "best performers" marginally outperforms the ESI in both coincident and leading correlation, the forward looking ESI achieves a somewhat more marked improvement, but only in leading correlation. Given the high interest of policy makers and economic analysts in leading indicators, particularly the forward-looking one could be a promising option. However, more research into the properties of this candidate for an alternative ESI is warranted before any final judgment on its suitability can be made. Finally, it should be borne in mind that, given a publication delay in quarterly GDP figures of ca. 45 days, the ability to track GDP growth coincidentally implies a corresponding information lead of the ESI.

**Annex 1: The Economic Climate Tracer**

The graphs below show the economic climate tracer for the EU (including sectoral components), the euro area and the seven largest EU Member States.

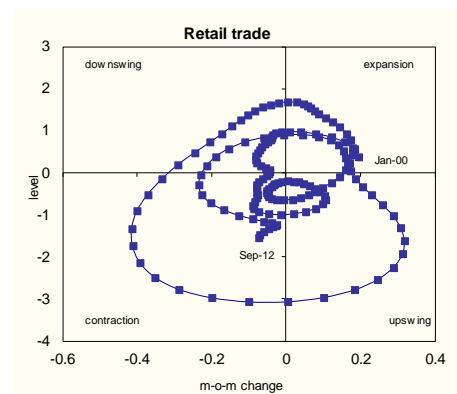
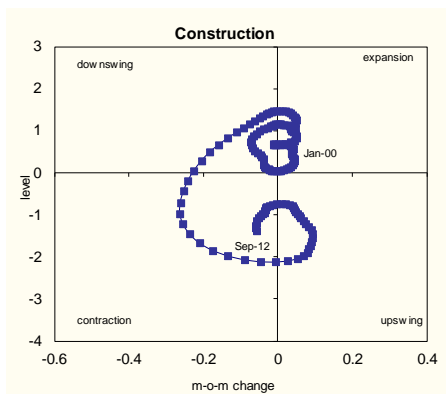
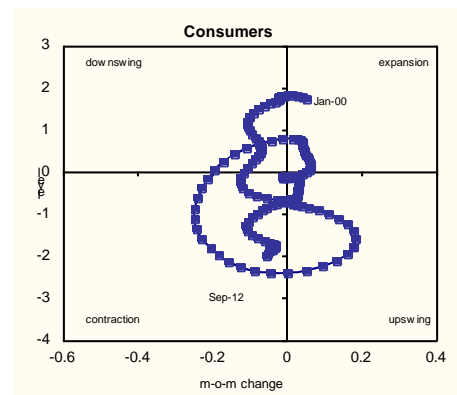
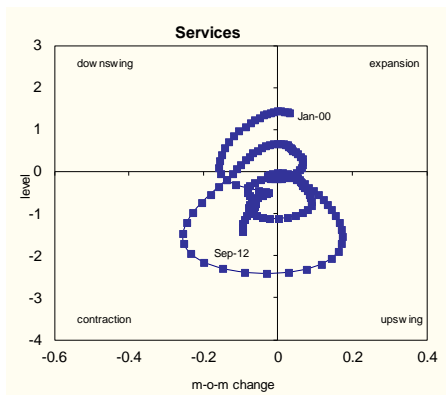
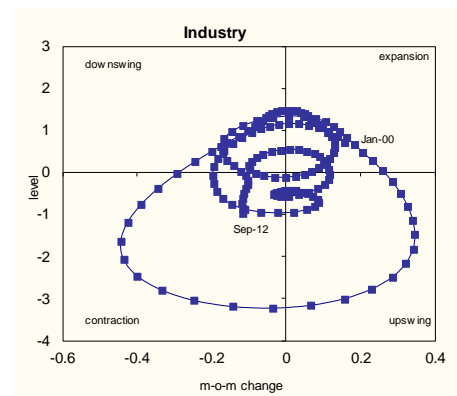
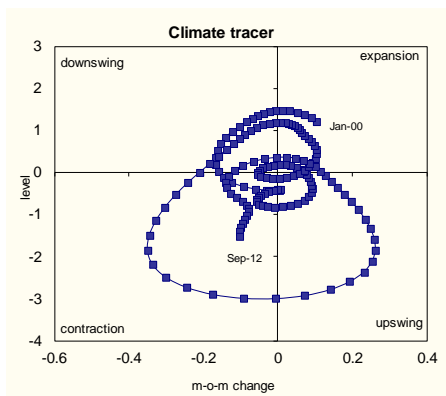
The series levels are plotted against their first differences (m-o-m changes), so that each chart depicts — at the same time — the current stance of the sector/country and its most recent dynamics. Series are smoothed to eliminate short-term fluctuations.

The four quadrants of the graphs enable four phases of the business cycle to be distinguished:

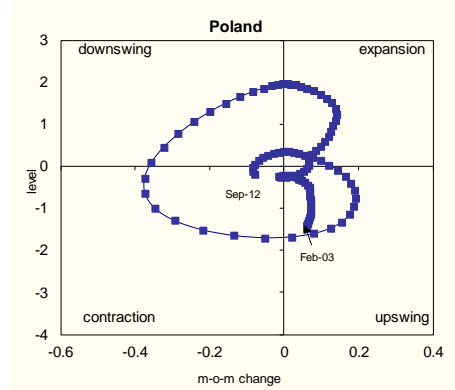
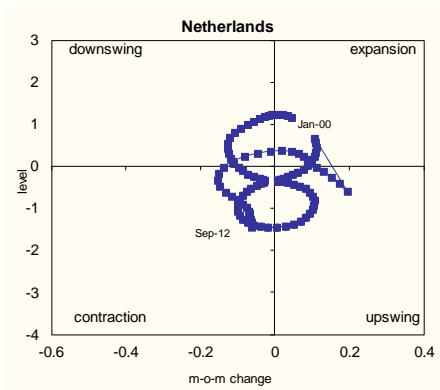
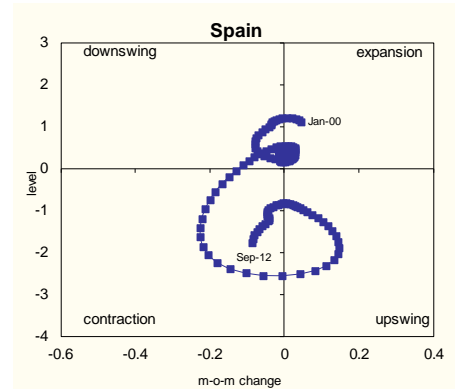
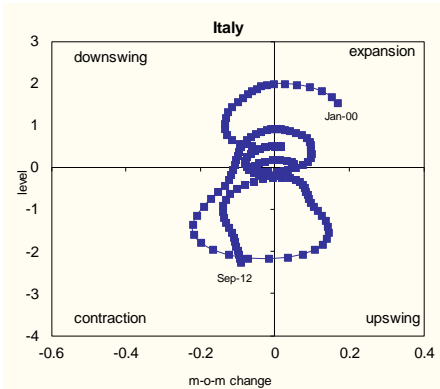
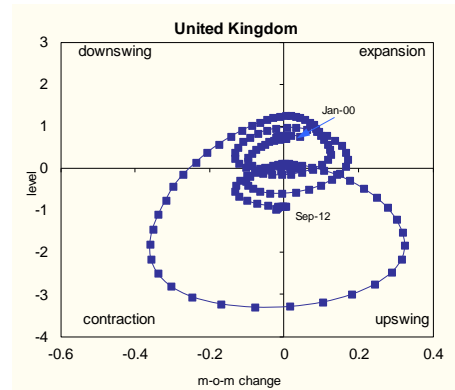
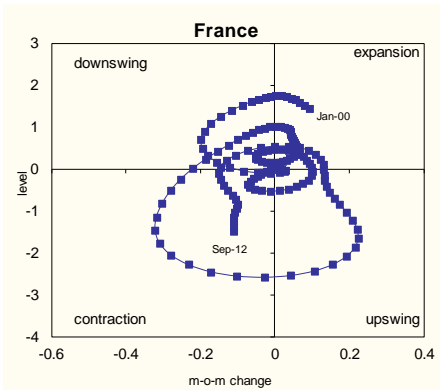
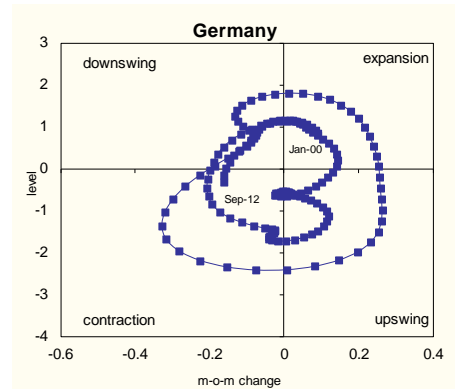
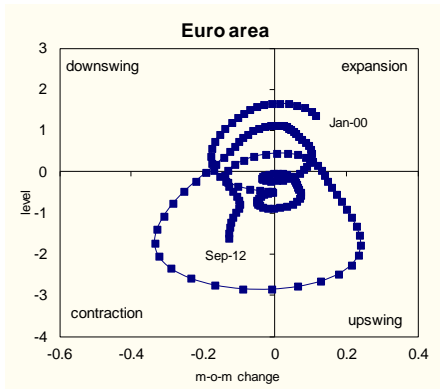
- "expansion" (top right quadrant),
- "downswing" (top left),
- "contraction" (bottom left), and
- "upswing" (bottom right).

Cyclical peaks are positioned in the top centre of the graph, and troughs in the bottom centre.

**Economic climate tracer across sectors, EU**



Economic climate, largest EU Member States

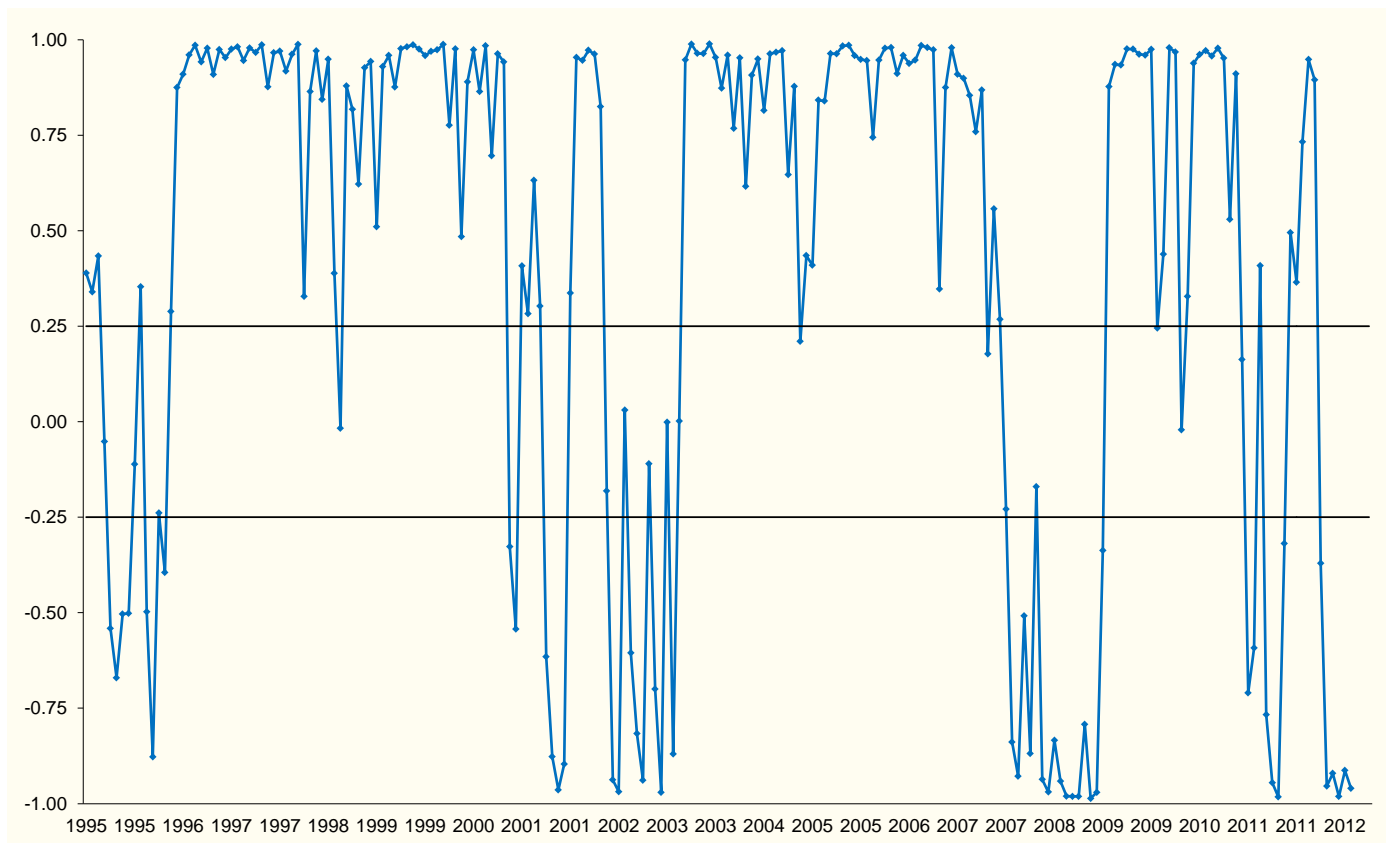


**Annex 2: Euro-area turning point index**

The turning point index — based on a Markov switching model — estimates the difference between high- and low-regime probabilities.

On the basis of the latest survey data for the euro area, the turning point index (TPI) was at -0.96 in September 2012, after -0.91 in August.

By design, the computation of the turning point aims to extract the surprises — positive or negative — from new information in the surveys. In the third quarter of 2012, confidence deteriorated further compared with the previous quarter. The innovations within the framework of the AR modelling method are interpreted as negative. The TPI currently stands very close to -1, pointing to a further unfavourable cyclical phase in 2012Q3.

**Turning point index for the euro area**

**Annex 3: Reference series**

The reference series are from Eurostat, via Ecwin:

| <b>Confidence indicators</b> | <b>Reference series (volume/year-on-year growth rates)</b>                           |
|------------------------------|--|
| 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           |

**Economic Sentiment Indicator**

The economic sentiment indicator (ESI) is a weighted average of the balances of replies to 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 it 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 the construction of the ESI can be found at:

[Methodological guides - Surveys - DG ECFIN website](#)

Long time series of the ESI and confidence indicators are available at:

[Survey database - DG ECFIN website](#)

**Economic Climate Tracer**

The economic climate tracer is a two-stage procedure. The first stage consists of building economic climate indicators. These are based on principal component (PC) analyses of

balance series (s.a.) from the surveys conducted in industry, services, building, the 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 as follows: 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. The economic climate indicator (ECI) is a weighted average of the five PC-based sector climate indicators. The sector weights are equal to those underlying the economic sentiment indicator (ESI), i.e. industry 40 %; services 30 %; consumers 20 %; construction 5 %; and retail trade 5 %. The weights were allocated on the basis of two broad criteria: the representativeness of the sector in question and historical tracking performance in relation to GDP growth.

In the second stage 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 a 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 purpose of the turning point index model, based on the work of Grégoir and Lengart (2000)<sup>8</sup>, is to identify economic growth trends in the euro area, using all the confidence indicators derived from the surveys of industry, services, building, and consumers as input. This model is symmetric in signalling turning points. TPI values within the  $\pm 0.25$  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 on whether the previous period was marked by acceleration or deceleration. By contrast, the signal is very consistent when TPI values are very close to or reach  $\pm 1$ : 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).

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<sup>8</sup> Grégoir, S. and Lengart, F. (2000), 'Measuring the probability of a business cycle turning point by using a multivariate qualitative hidden Markov model', *Journal of Forecasting*, 19.