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# European *Business Cycle* indicators

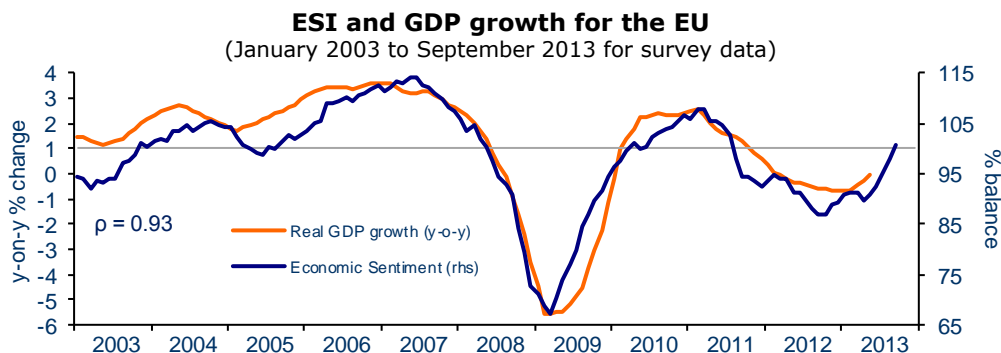
SHORT - TERM ANALYSIS FROM EUROPEAN COMMISSION'S DIRECTORATE GENERAL FOR ECONOMIC AND FINANCIAL AFFAIRS

## Developments in business and consumer survey data in 2013Q3

- In the third quarter of 2013, economic sentiment continued the upward tendency of the last quarter. Both the euro area and the EU Economic Sentiment Indicator (ESI) registered improvements in every month of the quarter. September's increase brought the EU indicator above its long-term average for the first time since July 2011.
- The improvements in sentiment were driven by increasing confidence in all surveyed business sectors (industry, services, retail trade, construction), as well as among consumers. In the case of construction, the improvement was comparatively modest.
- Economic sentiment booked increases in all largest EU economies (Germany, France, the UK, Italy, Spain, the Netherlands and Poland). Increases have been particularly important in the UK and Italy.
- Capacity utilisation in the manufacturing sector improved compared to the last quarter and currently stands around 78% in both the EU and the euro area.

## Highlight: Using survey data for measuring uncertainty

The length of the crisis that started in 2007/08 has brought the role of uncertainty in macro-economic fluctuations to the fore. While economic theory suggests that increases in uncertainty have a negative impact on economic activity by depressing hiring, investment and consumption, measuring uncertainty is intrinsically difficult. The highlight section looks into a relatively new approach to measuring uncertainty based on survey data. The approach is based on the idea that respondents' survey replies will be more or less concordant, depending on the degree of (un-)certainty about the future course of the economy. Looking into the evolution of an uncertainty index that measures the degree of dispersion of replies in the different sectors of the economy, the section concludes that survey data can be useful to gauge economic uncertainty. However, the empirical functioning of the presented measure applied to real survey data also points to some non-trivial caveats that call for caution in the interpretation of the measure and require more work to fully understand the at times opposing mechanics driving the results.



Note 1: The horizontal line (rhs) marks the long-term average (=100) of the sentiment indicator.  
Note 2: Both ESI and y-o-y GDP growth 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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For questions,  
comments and further  
information,  
contact: [Christian.Gayer@ec.europa.eu](mailto:Christian.Gayer@ec.europa.eu)

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

The Economic Sentiment Indicator (ESI) for the EU and the euro area saw steady increases over the third quarter. Continuing the upward tendency of the last quarter, the European Commission's headline survey indicator of economic activity currently records five consecutive monthly improvements.

Compared to the readings at the end of the second quarter of 2013, the ESI has booked substantial gains of 8.0 (EU) and 5.6 points (euro area). Such extreme spikes in sentiment were witnessed for the last time in the immediate aftermath of the financial crisis (2009Q3 in the EU, 2009Q4 in the euro area). The quarterly profile of the ESI is broadly in line with the results of the Ifo's Business Climate Index (for Germany) and Markit Economic's Composite PMI for the euro area.

At the sector level, the ESI was driven by increasing confidence in all surveyed business sectors, as well as among consumers. Except for construction, all surveyed sectors reported brightening sentiment in every single month of the quarter. Cross-sector comparison shows the quarterly profiles to be broadly similar. The quarterly profile in construction stands out in so far as the net increase in confidence at the end of the third quarter is the result of a single confidence spike in September.

At country level, the upward sloping curve of the EU/euro area ESI was in line with developments in the seven largest EU economies. Sentiment in Spain, France, Italy, Poland and the UK increased in every month of the quarter. The overall increase compared to the last month of the previous quarter was most striking in the UK (+18.1 points) and Italy (+7.4). Germany and the Netherlands saw a general increase over the third quarter. However in September, sentiment was flat in Germany and declined in the Netherlands.

### Sector developments

In the course of the third quarter of 2013, **industry** confidence edged up by 6.1 points in the EU and 4.5 points in the euro area. In both areas, September's reading marked the fifth consecutive month of increased confidence. Among the largest EU economies, the confidence gains were most pronounced in the UK (+21.5), followed by Italy (+5.8) and Germany (+5.7). Spain, France, the Netherlands and Poland booked increases in the range of 2-3 points.

The increase in the EU/euro area industrial confidence indicator was driven by a more positive assessment of all questions entering the calculation of the indicator. In the EU, the magnitude of change

was generally somewhat higher than in the euro area thanks to very positive developments in the UK. . In both areas, the question displaying the sharpest improvement concerned managers' production expectations. Also the level of order books and of the stock of finished products was viewed more positively. As for the survey questions not included in the industrial confidence indicator, all of them are consistent with an increased level of confidence. However, managers' assessment of production trends observed during recent months as well as the level of export order books saw significantly sharper increases than managers' employment and price expectations.

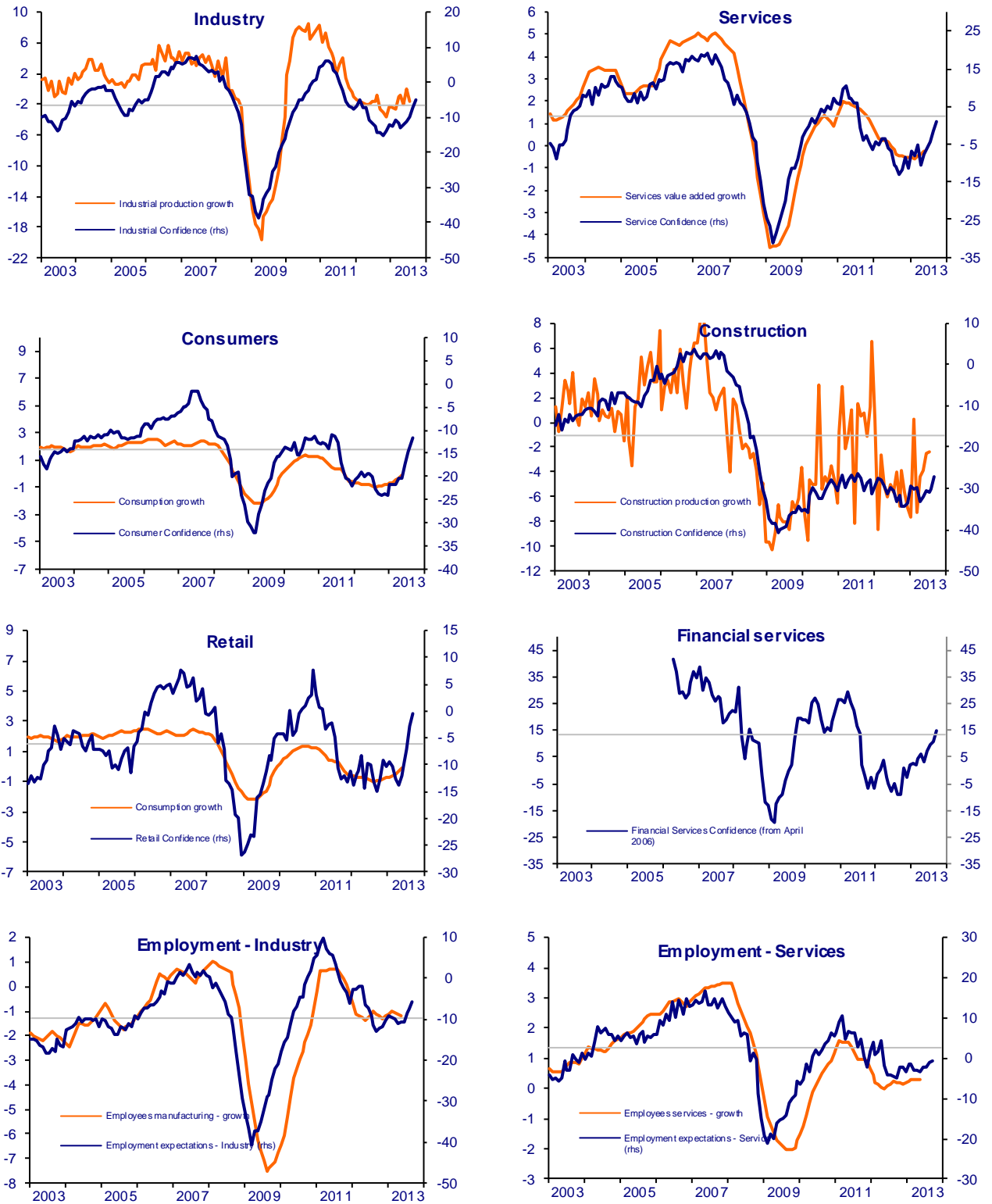
July's results for the **quarterly manufacturing survey** showed increases in the capacity utilisation rate of 0.4 pp in the EU (to 78.1%) and 0.8 pp in the euro area (to 78.3%). In both cases, the q-o-q change is the largest in two years and could more than compensate the slight losses of the previous quarter. Notwithstanding the positive developments, the capacity utilisation rate is still some three points below the long-term average capacity utilisation rate.

Following the sharp slip in April, **services** confidence embarked upon a steady recovery in the ensuing months. In September, confidence edged up for the fifth (EU) / third (euro area) consecutive month. At the end of Q3, services confidence stands at levels that were last reached in July 2011 (EU) / April 2012 (euro area). While all component questions of the confidence indicator picked up in Q3, the assessment of the past business situation was particularly positive in both areas. The appraisals of past demand and demand expectations also continued their recoveries, but at a less noticeable pace.

Services confidence increased in all of the seven largest EU economies. In the UK, Spain and Italy, readings at the end of Q3 are around 10 points higher than at the end of the previous quarter. In Germany, France, Poland and, in particular, the Netherlands, the increases were more modest.

In the third quarter of 2013, **retail trade** confidence saw significant improvements, which brought the indicator in both the EU and the euro-area above its long-term average. September's reading is the highest since March 2011 (EU) / July 2011 (euro area). The increase in confidence was based on favourable developments in all components (past business situation, adequacy of stocks and business expectations), whereby the assessment of the past business situation changed the most and the appraisal of the volume of stocks the least. Among the seven major EU economies, confidence skyrocketed in the UK and increased considerably in Germany, Spain, France and Italy. The Netherlands and Poland stand out with more moderate increases in confidence.

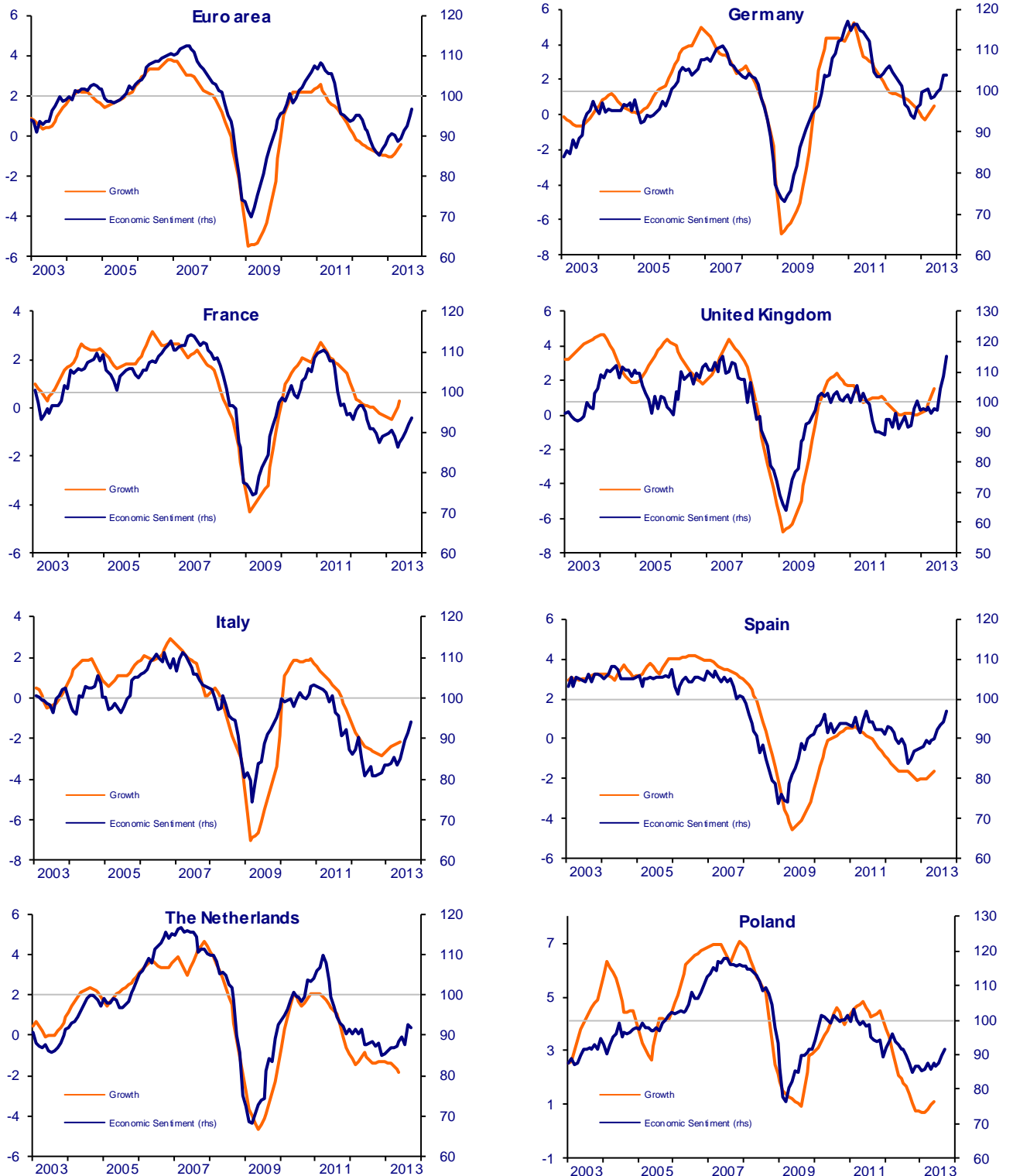
Graph 1.1: Sectoral confidence indicators and reference series for the EU (January 2002 to September 2013 for survey data)



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 2013 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 **construction** increased in the course of the third quarter. However, in comparison to the other sectors, the increase is rather modest and results mainly from a spike in confidence in September. In both the EU and the euro area, the overall increase from June to September is attributable to upward revisions in managers' employment plans, while the assessment of the level of order books increased only moderately (EU) or remained broadly flat (euro area). At country level, the largest confidence spikes could be observed in Italy, the Netherlands and the UK, while the pick-up in confidence was more muted in Germany, Spain, France and Poland.

**Consumer** confidence continued its upward trend, registering the 9<sup>th</sup> (EU) / 10<sup>th</sup> (euro area) consecutive m-o-m increase. In both areas, the indicator's development was mostly fuelled by consumers' more positive appraisal of macro-economic variables (expectations regarding the future general economic situation and unemployment expectations). The improvement in the assessment of the other two components of the confidence indicator, which relate to households' financial situation (expected financial situation and envisaged savings), was less strong. Envisaged savings, although viewed more positively from a quarter-on-quarter perspective, were assessed more negatively in September than in August. As for the largest EU economies, cross-country differences in the development of consumer confidence were significant. While the indicator improved by more than 8 points in the UK, France and Spain, increases were below 4 points in Poland, the Netherlands and Italy. Germany even saw confidence slightly weakening compared to the end of the previous quarter.

Confidence in **financial services** – which is not included in the ESI – continued the recovery that has started in 2012Q4. Contrary to the drivers of the increase in the last quarter, this quarter's developments were fuelled by skyrocketing demand expectations. The assessment of the past business situation and past demand improved to a lesser extent.

The overall positive developments over the second quarter are illustrated by the evolution of the climate tracers. The economic climate tracer for the EU has moved further up in the upswing quadrant, coming closer to the border with the expansion quadrant. (see Annex 1 and Annex 2 for further details). This movement is backed by the climate tracers for all individual sectors. The industry, services, consumer and construction climate tracers moved further into the upswing quadrant. The retail trade climate tracer advanced most: While the indicator was still just on the left edge of the upswing quadrant at the end of the previous quarter, the significant improvements over the third quarter have led the indicator to the border towards the expansion quadrant.

## 2. Recent developments in selected Member States

In the third quarter of 2013, economic sentiment booked marked increases in all seven largest EU economies.

Economic sentiment in **Germany** increased in the third quarter of 2013, continuing the upward trend in place since May. At 104.1 points at the end of September, the ESI stands above its long-term average of 100. The main drivers of the quarterly increase were retail trade, services and industry. The construction sector only made a small contribution, while consumer confidence slightly eased.

In **France**, the ESI continued the upward trend in place since May. While confidence improved in all surveyed sectors, the gains were particularly sharp among consumers and in the retail trade sector. The French industrial sector showed the weakest increase over the quarter and is the only sector where confidence slipped in September. At 93.5 points, the ESI remains below the euro-area reading and well below its long-term average of 100.

Following last quarter's decrease, the ESI in the **United Kingdom** marked a sharp increase. In line with the brightening sentiment, the ESI has settled much above its long-term average of 100. Currently, it stands at 115.4, which is just one point away of its historic maximum of December 1997. The indicator's performance is the result of confidence picking up in all surveyed sectors, whereby the improvement in construction confidence is by far the weakest and the sectoral indicator even slightly slipped in September.

In **Italy**, the ESI improved significantly and currently has a record of five consecutive monthly increases. The improvement was fuelled by positive developments in retail trade as well as services, and, to a lesser extent, building and industry. The slight increase in consumer confidence is negligible compared to the magnitude of change in the other sectors. Standing at 94.0 points, the Italian ESI remains below the euro-area reading and its historical average of 100.

In **Spain**, the ESI continued its recovery. In September it improved for the sixth consecutive month. The continued recovery was driven by services, consumers and retail trade. The gains in industry and construction were significantly smaller. Contrary to all other sectors, construction does not display a clear upward trend. At 96.8, while in line with the euro-area score, the Spanish ESI is still below its long-term average.



Economic sentiment in the **Netherlands** continued to recover from the low levels reached at the end of 2012. However, in comparison to its peers, the recovery is rather slow. A sharp increase in sentiment in August could compensate for the losses of July and September and thus ensured that sentiment at the end of Q3 is slightly higher than at the end of Q2. The sectoral contributions to the increase were similar, with the exception of construction, which displayed sharper increases. The ESI currently stands at 91.8 points and thus still markedly far off its long-term average of 100.

Sentiment in **Poland** increased over the third quarter. All sectors contributed to the increase, whereby retail trade booked the smallest increases and was the only sector seeing confidence slip again in September. At 91.5 points, the ESI is well below its long-term average of 100 and the score for the EU.

### 3. Highlight: Using survey data for measuring uncertainty

Since the start of the crisis in 2008, a large and growing part of the economic literature has looked into the role of uncertainty in macro-economic fluctuations and how uncertainty can usefully be measured.

While there is a general consensus that increases in uncertainty can have a negative impact on economic activity by depressing hiring, investment and consumption,<sup>1</sup> there is no agreed, objective measure of uncertainty yet.

Among the different uncertainty measures that have been proposed until now are measures based on stock market volatility<sup>2</sup>, the dispersion in forecasts by

<sup>1</sup> Bernanke, B. (1983), "Irreversibility, uncertainty, and cyclical investment", *The Quarterly Journal of Economics*, Vol. 98(1), 85-106.

<sup>2</sup> Kose, M., and M. Terrone (2012), "How does uncertainty affect economic performance?", *World Economic Outlook*, Box 1.3, pp 49-53; Bloom, N. (2007), "The impact of uncertainty shocks", *NBER Working Papers* 13385, National Bureau of Economic Research.

professional forecasters<sup>3</sup>, or the prevalence of terms such as 'economic uncertainty' in the media<sup>4</sup>.

The Policy Uncertainty Indicator for the EU proposed by Baker et al. (2013) is a combination of the latter two approaches: one component quantifies newspaper coverage of policy-related economic uncertainty. A second component measures disagreement among economic forecasters (forecast for consumer prices and federal government budget balances) as a proxy for uncertainty.

A relatively new approach to measuring uncertainty is based on survey data. Similar to measures based on the dispersion of professional forecasts, the approach starts from the idea that respondents, when replying to questions about their economic expectations, will be more or less concordant in their views, depending on the degree of (un-)certainty about the future course of the economy.<sup>5</sup>

A potential caveat of this approach is that time-varying dispersion in e.g. firms' survey responses might simply mirror structural heterogeneity between respondents, i.e. some firms or branches react differently to cyclical shocks than others, without this being related to changes in uncertainty. The same applies to consumer surveys, where dispersion in consumers' expectations about their personal financial situation can be driven by structurally different developments across e.g. income categories. Richer people may be very certain that their situation will improve, while poorer respondents are certain of a worse future situation. This could drive up the divergence indicator, but not for the reasons it shall trace.

Bachman et al. (2010) investigated this issue for German manufacturing survey data showing that their derived dispersion measure delivers qualitatively similar results to an alternative uncertainty measure which conceptually excludes the

<sup>3</sup> Baker S., N. Bloom and S. Davis (2013), "Measuring economic policy uncertainty", *Chicago Booth Research Paper* No. 13-02.; Bowels and al. (2007), "The ECB Survey of Professional Forecasters (SPF): a review after eight years' experience" *ECB Occasional Papers series* No 59.

<sup>4</sup> Baker and al. (2013), op. cit.; Knotek, E.S. and S. Khan (2011), "How do households respond to uncertainty shocks?", *Economic Review, Federal Bank of Kansas City*, issue QII.

<sup>5</sup> Bachman, R., S. Elstner and E. Sims (2010), "Uncertainty and economic activity: evidence from business survey data", *NBER Working paper* 1643; European Commission (2013), *Quarterly report on the Euro Area*, Volume 12 No 2, "Assessing the impact of uncertainty on consumption and investment", 7-16.

impact of heterogeneous but certain changes in expectations.<sup>6</sup> This suggests that the issue of heterogeneous respondents is not so important empirically and lends support to the approach of measuring uncertainty through survey disagreement.

European Commission (2013) finds a high correlation between the uncertainty indicators using survey disagreement of euro-area manufacturing managers and consumers and the Policy Uncertainty Indicator, which is striking given that the two measures are based on different methods and capture different concepts of uncertainty<sup>7</sup>.

Starting from these evidences of the general usefulness of a measure of survey disagreement for proxying economic uncertainty, this section broadens the scope of application to the surveys conducted in services and retail trade. Given the at times counterintuitive and/or time-inconsistent results, the analysis then looks into the mechanics of the measure from a theoretical perspective. Confronting the empirical results with the theoretical characteristics points to some practical caveats of the uncertainty measure. The analysis delivers first insights how to overcome these caveats in order to extract reliable signals on economic uncertainty from survey data.

### The data used to measure uncertainty

In order to gauge the degree of uncertainty among managers and consumers the replies of managers and consumers to the following questions on expectations are analysed:

- In the manufacturing industry sector: question 5 "how do you expect your production to develop over the next 3 months?"
- In the services sector: question 3 "how do you expect the demand (turnover) for your company's services to change over the next 3 months?"

<sup>6</sup> This different measure is based on the comparison of individual managers' production expectations with later answers on their past production realisations and is defined as the standard deviation of individual expectation errors.

<sup>7</sup> While uncertainty based on surveys is a measure of dispersion within firm's about their expected future production, the Policy Uncertainty Indicator is based on both the number of entries related to 'economic uncertainty' in the press, and dispersion in professional forecast' about budget deficits and CPI inflation.

- In the retail trade sector: question 4 "How do you expect your business activity (sales) to change over the next 3 months?"
- In the consumer survey:
  - question 2 "How do you expect the financial position of your household to change over the next 12 months?" and
  - question 4 "How do you expect the general economic situation in this country to develop over the next 12 months? "

Respondents to the industry, services and retail trade surveys can select one of three possible answer categories: 'increase' (+), 'remain unchanged' (=), 'decrease' (-). In the consumer survey, respondents can choose between six categories: 'get a lot better' (++), 'get a little better' (+), 'stay the same' (=), 'get a little worse' (-), 'get a lot worse' (--), 'don't know' (N).

### Measuring uncertainty

As sketched above, the idea underlying the measuring of uncertainty using business and consumer survey (BCS) data is that a growing divergence of economic agents' expectations about the future development of their business (or their country or the financial situation of their household) should be a sign of higher uncertainty about the future course of the economy.

The main consideration in choosing how to measure uncertainty is that uncertainty should be at maximum when the divergence of individual replies is largest, while uncertainty should be at minimum when all respondents choose the same possible answer, i.e. there is full concordance about the direction of future changes.

In line with Bachman et al. (2010), the uncertainty index is thus defined as:

$$Uncertainty_t =$$

$$\sqrt{Frac_t(+)+Frac_t(-) - (Frac_t(+) - Frac_t(-))^2},$$

where e.g.  $Frac_t(+)$  is the fraction of 'increase' responses to a survey question at time  $t$ .

This definition of the uncertainty index<sup>8</sup> is directly applicable to the survey questions from the industry,

<sup>8</sup> This index is different from the one used to measure uncertainty with BCS data in the *Quarterly report on the Euro Area*, Volume 12 No 2 (2013), DG ECFIN, European Commission.



services and retail trade surveys. To apply it to the more granular answer scheme of the consumer survey, the '++' and '+' fractions of answers are aggregated into the category 'better' and the '-' and '--' fractions into the category 'worse'. The formula can then be applied to these fractions just like for the business surveys.

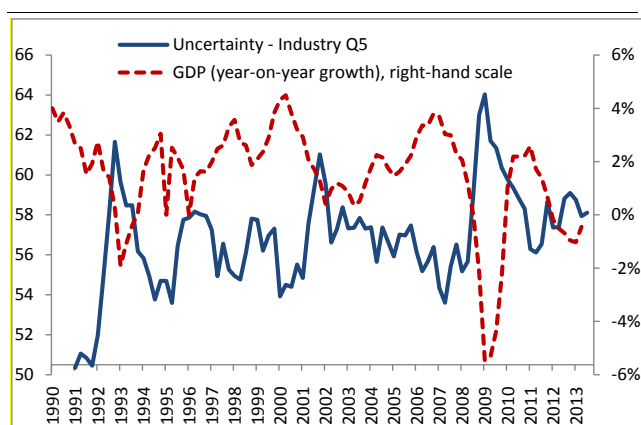
To give some more intuition to the measure, Uncertainty is in fact nothing else than the cross-sectional standard deviation of the survey responses, if the 'increase/better' category is quantified by +1, the 'decrease/worse' category by -1 and the residual category by 0.

Uncertainty is at maximum, equal to 100, when half of the respondents replied 'increase/better' and half of them replied 'decrease/worse', while Uncertainty will be at minimum, equal to zero, when all respondents choose the same reply category. It is important to note that this means that zero uncertainty can imply perfect certainty about a future improvement, an unchanged situation or a deterioration. In theory, the measure is thus symmetric with respect to good or bad expectations.

**Developments in uncertainty across sectors**

This section looks into the empirical evolution of the above-defined uncertainty measure in the different sectors of the euro-area economy. In the *manufacturing industry*, survey-based uncertainty increased during the past three crisis periods, peaking in the last quarters of 1992 and 2001 and in the first quarter of 2009 (Graph 1).

Graph 1: **Euro area:** Uncertainty in the industry\* sector and real GDP (year-on-year growth)



\* Data for Uncertainty are available monthly, but have been converted to quarterly frequency for ease of display. Source: European Commission.

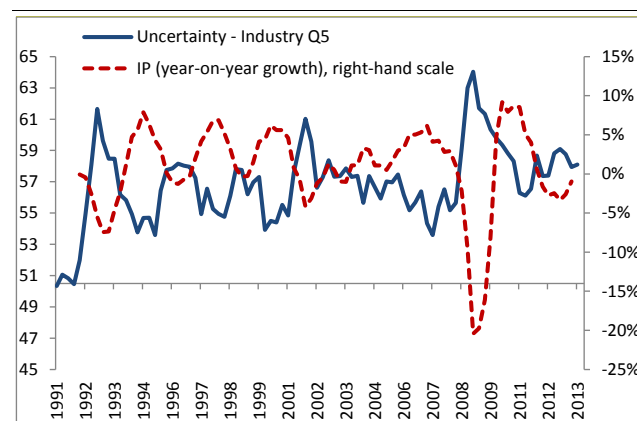
These results are in line with developments in year-on-year growth of euro-area GDP. Peaks in Uncertainty correspond to troughs in GDP growth and vice versa. In practice, the relation with respect to

GDP growth is thus not symmetric, in the sense that uncertainty decreases mainly when economic developments are clearly improving but not when they are clearly deteriorating. In the latter case, a mounting general perception that future developments will worsen should in principle lead to a predominant choice of the 'decrease' option, which should then drive the uncertainty measure down.

Yet, the empirically asymmetric reaction of the measure results in a high negative correlation of Uncertainty with GDP growth: the correlation coefficient over the period 1991Q1 - 2013Q2 is equal to -0.8. The correlation coefficient is at its maximum for a coincident relation, suggesting that – apart from the informational lead due to the earlier availability of the survey data - uncertainty derived from survey data has no leading properties. In any case the observed relation between Uncertainty and growth is associative rather than necessarily causal.<sup>9</sup>

The picture is broadly unchanged when Uncertainty based on manufacturers' production expectations is plotted against industrial production growth (Graph 2).

Graph 2: **Euro area:** Uncertainty in the industry sector and Industrial Production in manufacturing\* (year-on-year growth)



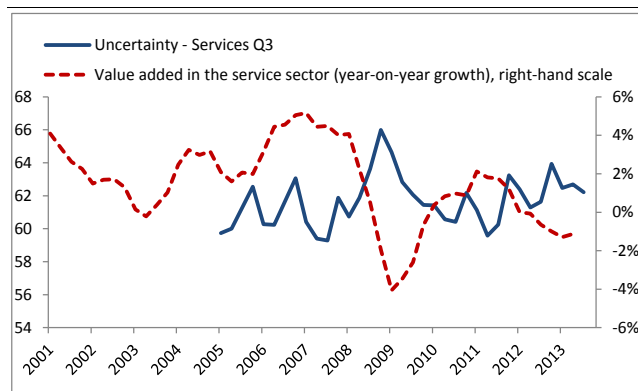
\* see Graph 1. Source: European Commission.

Given that the harmonised survey in the *services sector* started only in 1996 and that the shares of positive, unchanged and negative replies are only available from September 2006<sup>10</sup>, the uncertainty indicator for that sector is shorter. However, the

<sup>9</sup> See similar conclusions in Baker et al (2013), op. cit.  
<sup>10</sup> This reflects data losses due to the change from NACE 1 (Nomenclature of Economic Activities) to NACE rev.2 in May 2010.

reading based on question 3 of the survey ('demand expectations') is similar to the industry sector: the dispersion among managers' replies increases in worsening periods and peaks when value added in the services sector (which is the reference series the survey is supposed to track) is at its minimum. The correlation between the two series is -0.6. The reaction of the uncertainty indicator is thus again not symmetric to good or bad news.

Graph 3: **Euro area:** Uncertainty in the services\* sector and value added in the services sector (year-on-year growth)



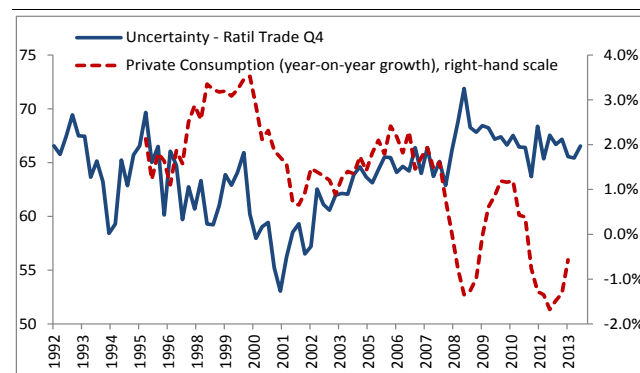
\* see Graph 1.

Source: European Commission.

A slightly different picture is observable when Uncertainty is based on question 4 (business activity expectations) of the *retail trade sector* (Graph 4). At the end of 1999, the uncertainty measure started to decrease in conjunction with a drop in private consumption growth. The uncertainty indicator remained on a downward path until mid-2001; it then started to increase six months before consumption growth recovered.

The uncertainty measure derived from the retail trade survey data does thus not capture the increase in uncertainty that should have been observed when consumption growth started to decline during the period 2000Q1-2001Q4. While it did peak with plummeting consumption growth during the 2008 crisis, there are again no clear signs of higher uncertainty when consumption growth fell back again over 2010Q3-2012Q2.

Graph 4: **Euro area:** Uncertainty in the retail trade\* sector and Private Consumption (year-on year growth)



\* see Graph 1.

Source: European Commission.

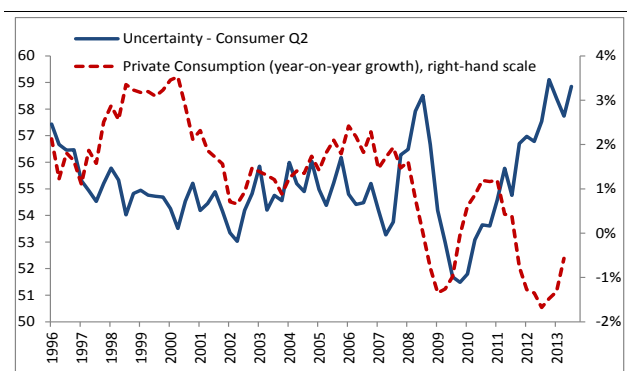
The relationship in the early 2000s is more in line with the expected symmetric behaviour of the uncertainty index, in the sense that retailers appear to have become more concordant in their negative views about the future demand situation. With slowly recovering consumption growth over 2002 – 2007 Uncertainty can be argued to have rightly increased again, reflecting that some retailers remained cautious while others (more and more) responded positively to the survey. However, when the situation worsened sharply in 2007/08, the index points to higher dispersion in retailers' expectations. This and the ensuing development of the indicator is hard to reconcile with a symmetric reaction pattern. In principle, Uncertainty should have come down once retailers' views about the bleak economic outlook became concordant. While a slight decrease in Uncertainty can indeed be seen in mid-2008, the measure has remained at a high historical level and remarkably flat thereafter, given the considerable swings in consumption growth over 2009 – 2013.

A similarly unsystematic relationship between consumption growth and the survey based uncertainty measure emerges for consumers' expectations according to questions 2 (financial position of the household) and 4 (economic situation in the county) of the *consumer survey*.

Graph 5 shows that when private consumption growth started to decrease in late 2007, Uncertainty increased strongly among consumers, before decreasing strongly again in the third quarter of 2008, suggesting that consumers became very concordant about the likely worsening of their financial situation. With the crisis abating over 2010 and into 2011, the uncertainty measure increased in line with its supposedly symmetrical behaviour due to a rising share of positive survey respondents. However, the uncertainty measure continued to increase sharply even when the again clearly worsened economic outlook in 2011 – 2012 would

have suggested that consumers became certain rather than uncertain about the (bad) implications for their financial situation. However this did not happen because the implications of the sovereign debt crisis were unclear at that stage.

Graph 5: **Euro area:** Uncertainty in the question 2 of the Consumers\* survey and Private Consumption (year-on-year growth)

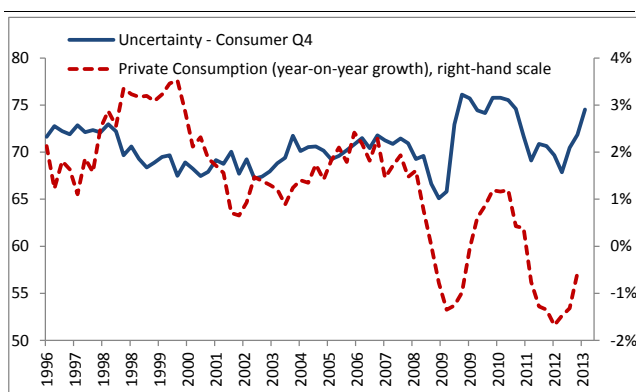


\* see Graph 1.

Source: European Commission.

Question 2 of the consumer survey is a question about respondents' subjective, personal financial situation. One could then check against question 4, which asks consumers about the general economic situation in the country.

Graph 6: **Euro area:** Uncertainty in the question 4 of the Consumer\* survey and Private Consumption (year-on-year growth)



\* see Graph 1.

Source: European Commission.

Visual inspection of the developments of Uncertainty derived from this question (Graph 6) shows that the measure to some extent mirrors the economic developments as intuition would suggest. In contrast to the positive correlation with economic developments observed for the manufacturing and

services surveys, the measure based on consumer expectations shows a markedly positive correlation with growth developments since the early stages of the crisis. The falling uncertainty in 2008 appears to be due to a rising concordance among consumers about the deteriorating economic outlook. Uncertainty in consumers' assessments rose again when the situation temporarily improved as from 2009. However, consumers were apparently never sure enough of a reliably improved outlook, i.e. the dispersion of their views and thus Uncertainty remained at high levels over this period. When things started to get gloomy again around mid-2011, Uncertainty decreased, reflecting that consumers became increasingly certain about the deteriorated outlook. The pick-up in the uncertainty measure in 2013 indicates less dominance of pessimistic expectations.

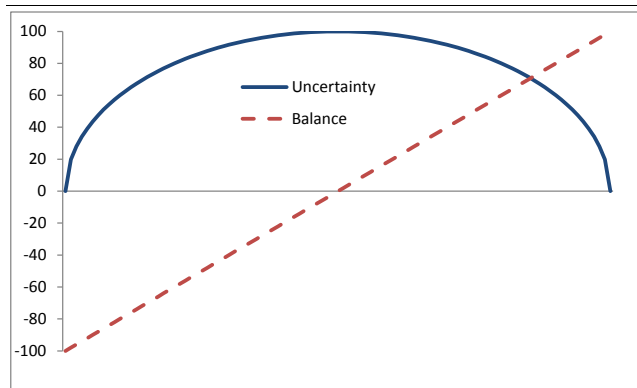
It has to be noted that such rationalisation of the uncertainty indicator brings it conceptually very close to the usual interpretation of 'confidence indicators' (based on the balance of positive over negative survey replies). While the empirical analysis of the uncertainty measures based on the manufacturing and services survey results indicates that they basically behave like negatively defined confidence indicators (up in downswing, down in upswing), the uncertainty indicator based on consumers' economic expectations appears to behave like a sarcastic confidence indicator for crisis times: low uncertainty is a negative signal, since it corresponds to high certainty about a bad outlook, while high uncertainty implies less certainty about a bad outlook.

Together with the inconsistent messages derived from the uncertainty measures based on retailers' survey responses and consumers' expectations concerning their financial situation, the nature, interpretation and value added (compared to confidence indicators) of the presented uncertainty indicators remains somewhat unclear so far.

### Limitations of the uncertainty measures

Correctly reading the formula defining the uncertainty measure shows that Uncertainty should be at maximum when the divergence of the replies is at maximum, while it should be at minimum when all the respondents choose the same possible answer. Graph 7 illustrates the stylised development of the Uncertainty curve. Starting from a negative balance of -100 (i.e. the fraction of 'decrease' responses is 100, the other fractions are zero), uncertainty increases from zero to its maximum of 100 when the balance of replies is zero (i.e. the fraction of both 'increase' and 'decrease' corresponds to 50). Uncertainty then decreases again with the 'increase' fraction mounting above 50. Zero uncertainty is reached again when the balance is +100 due to a corresponding fraction of 'increase' replies.

Graph 7: **Uncertainty:** The assumption is that the fraction of "unchanged" replies is constant at zero and that the share of "increase" varies from 0 to 100.



Two important features of the uncertainty measure have to be recalled:

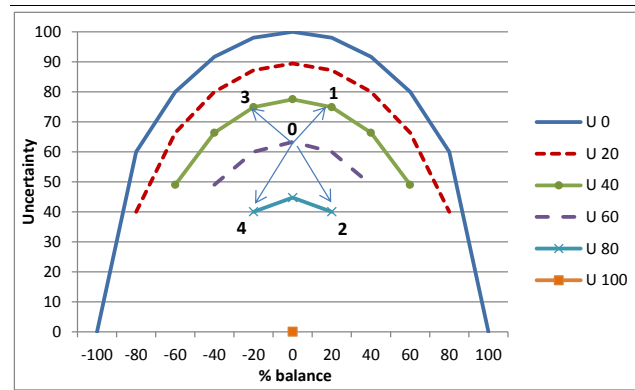
- The underlying formula does not differentiate between a dominant percentage of positive or negative responses. Thus, Uncertainty will be equal to zero when everybody expects an improvement but also when everybody expects a worsening of the situation.
- The share of 'unchanged' replies does not enter directly in the formula. However, the 'unchanged' share has a substantial impact on the results. Graph 8 displays the uncertainty curve for different 'unchanged' shares ('iso-unchanged' curves). In fact, the increase or decrease of Uncertainty can be caused by (1) a movement along the same 'iso-unchanged' line or by (2) a jump to a higher 'iso-unchanged' line representing a constellation where fewer respondents choose the 'unchanged' answer option.

The combination of these two factors can make it very difficult to interpret changes in Uncertainty, in particular when the changes in the 'unchanged' share are important and frequent.

Starting from a situation characterised by the central point of the U 60 iso-curve (share of 'unchanged' is 60, the balance of the remaining fractions of 20 for both 'increase' and 'decrease' is zero) (point 0), the following situations can occur (*inter alia*):

- The 'increase' fraction rises by 20 points to 40, the 'unchanged' fraction decreases to 40 (U 40 iso-line), 'decrease' stays unchanged. As an effect, the balance of positive over negative replies improves to 20 and Uncertainty goes up (point 1)

Graph 8: **Uncertainty:** Uncertainty (U) based on the 'unchanged' shares



- The 'increase' fraction remains at 20 points, but the 'unchanged' fraction increases to 80 (U 80 iso-line), while 'decrease' goes to zero. As an effect, the balance of positive over negative replies improves to 20 and Uncertainty goes down (point 2)

- The 'decrease' fraction rises by 20 points to 40, the 'unchanged' fraction decreases to 40 (U 40 iso-line), 'increase' stays unchanged. As an effect, the balance of positive over negative replies declines to -20 and Uncertainty goes up (point 3)

- The 'decrease' fraction remains at 20 points, but the 'unchanged' fraction increases to 80 (U 80 iso-line), while 'increase' goes to zero. As an effect, the balance of positive over negative replies declines to -20 and Uncertainty goes down (point 4)

As a general rule, the uncertainty measure can be seen to normally increase when the share of 'unchanged' replies is declining. In fact, this observation explains the lack of symmetry in Uncertainty based on the industry survey data (Graphs 1 and 2). For the underlying survey question 5, the balance statistic (the difference between the share of 'increase' and 'decrease') is normally above zero, with a minimum value of around -30 being reached in extremely bad times. At the same time, the share of 'unchanged' has remained broadly stable around 60%. However, Graph 9 illustrates that in times of serious crises the share of 'unchanged' suddenly drops. This is why in 1992/1993, 2001 and 2008 two opposing forces are driving the uncertainty indicator: the increasing dominance of negatives replies drives the indicator down (signalling a decrease of Uncertainty), while the decreasing share of 'unchanged' replies drives Uncertainty up (jump to a higher iso-line). Given the large extent of the decrease of the 'unchanged' share, the latter force generally dominates the development of the indicator. This corresponds to a change from point 0 to point 3 in Graph 8.

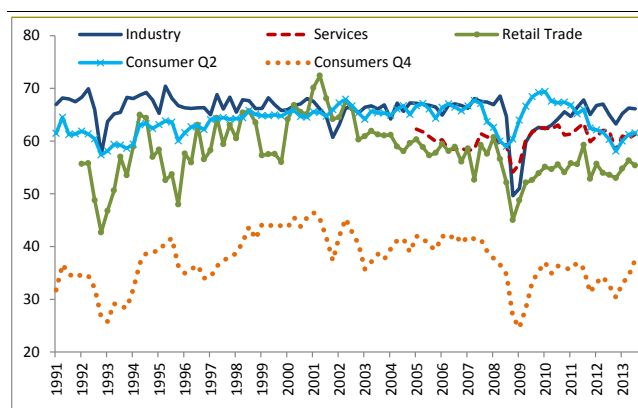
By contrast, in times of improving economic environment, the opposite situation occurs,

represented by a move from point 0 to point 2 in Graph 8: the share of 'unchanged' rebounds (see Graph 9), and the decrease of Uncertainty is even amplified by the jump to a lower iso-line.

This highlights the fact that while the survey data indeed signal correctly changes in uncertainty, the interpretation of the Uncertainty measure is not straightforward and needs to be interpreted together with the balance series and the share of 'unchanged' replies.

The same conclusion holds for Uncertainty derived from the services survey and to some extent also for the uncertainty measure for the retail trade and consumer surveys. In the latter two, however, the fraction of 'unchanged' replies is significantly more volatile over the whole data sample – leading to frequent shifts in the corresponding uncertainty measures and making their interpretation even more complicated.

Graph 9: **Euro area:** Share of 'unchanged' in the industry, services and retail trade surveys and consumer survey (Q2 and Q4)\*



\* see Graph 1.

Source: European Commission.

An alternative or complementary measure of uncertainty could be taken from the consumer survey by simply looking at the fraction of 'don't know' replies to the questions 2 and 4 of the survey. The observation that a higher share of consumers sees itself unable to indicate whether the economy/their financial situation will improve, remain unchanged or deteriorate might indeed be interpreted as a genuine signal of uncertainty, pointing to a situation where the information at hand is not sufficient to even make a qualified guess.

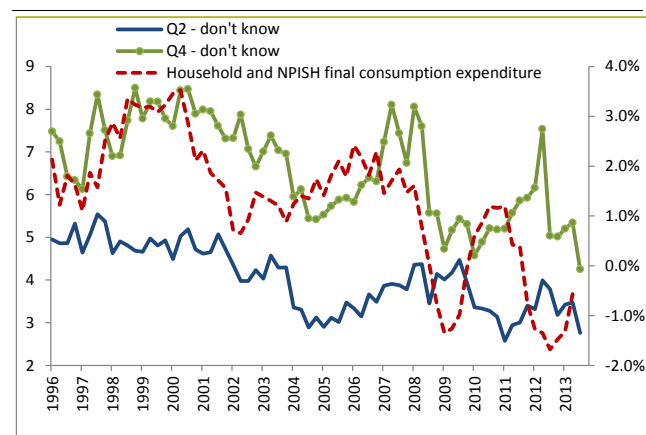
Graph 10 illustrates that the share of 'don't know' replies to Q4 started to increase already some months before the beginning of the first financial turmoil in mid-2007, when private consumption growth began to give first signals of deterioration.

The 'don't know' share then decreased when it became clear that the economic situation was worsening. The share increased some months before private consumption growth started to recover in mid-2009 and decreased again when it became clearer that growth was on an upward trend. These developments are in line with intuition on how an uncertainty measure should behave. However, subsequently the 'don't know' share increased again when consumption growth was still on its upward path and, more recently, the share did not reflect the rebound in consumption growth.

The changes in the 'don't know' share for Q2 show - to a certain extent - the same asymmetry that was observed for the manufacturing industry and services-based uncertainty measures, peaking in coincidence with the troughs at the beginning of 2009 and mid-2012 (Graph 10).

Therefore, while the analysis of the share of 'don't know' replies can be an interesting complement in analysing uncertainty in survey results, the measure does not always deliver consistent messages, similar to the above findings on the dispersion-based uncertainty measures.

Graph 10: **Euro area:** Share of "don't know" in questions 2 and 4 of the consumer\* survey and private consumption (year-on-year growth)



\* see Graph 1.

Source: European Commission.

## Conclusions

Based on the assumption that increasing divergence in survey respondents' views on future economic developments should signal an increase in uncertainty, this section looked into the cross-sectional standard deviation of survey responses to calculate an uncertainty measure.



The uncertainty measures for different sectors were evaluated against the developments of their respective reference series (GDP and industrial production growth for the industry survey, growth of value added for the services survey and private consumption growth for the retail trade and consumer surveys).

The analysis suggests that survey data are useful to gauge uncertainty among managers and consumers linked to economic developments. However, the interpretation of the presented uncertainty measure is not straightforward. As a matter of fact, changes in the measure are driven by two main forces: (1) the rising or falling dominance of 'increase' over 'decrease'-replies (or vice versa) and (2) the increasing or decreasing share of 'unchanged' replies. These two forces can work in the same direction, amplifying the total effect on Uncertainty, but can also operate in opposite directions.

Empirically this opposition of the two forces is often driving the discussed uncertainty measures applied to the BCS surveys. To arrive at a time-consistent assessment, the presented uncertainty measures therefore have to be interpreted carefully and along with the underlying shares of positive, unchanged and negative replies.

Clearly, an indicator of uncertainty that would correct for the influence of the share of 'unchanged' replies to the survey would be easier to interpret. Future work should therefore be devoted to disentangling the opposing forces driving the uncertainty measure presented here.



**Annex 1: The Economic Climate Tracer**

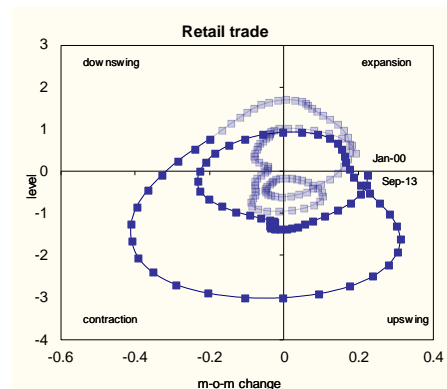
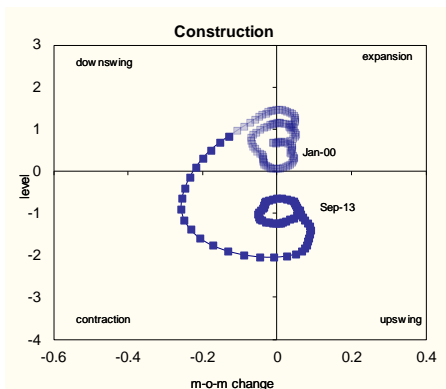
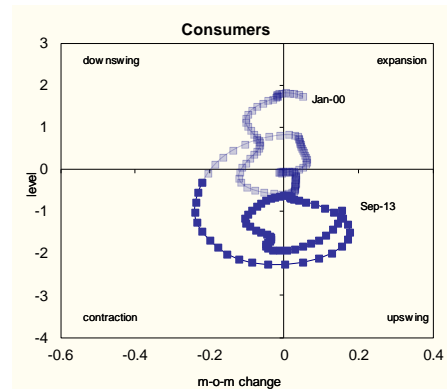
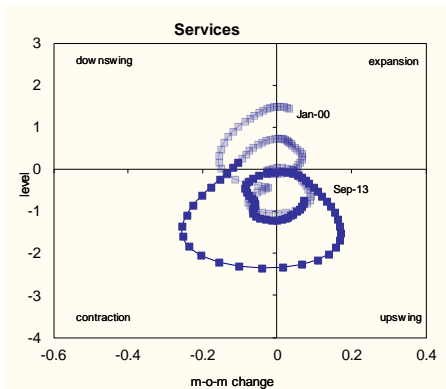
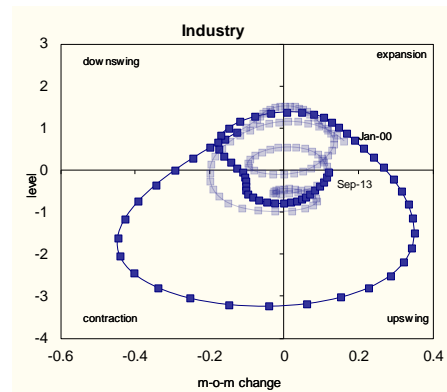
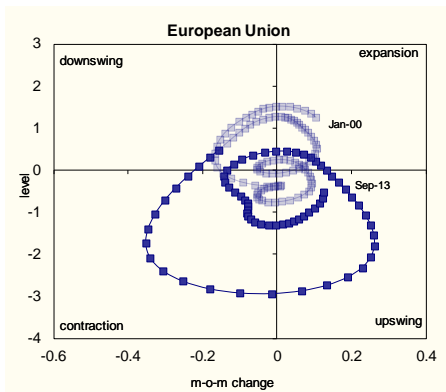
The graphs below show the economic climate tracer for the EU (including sectoral components), the euro area and the seven largest EU Member States.

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.

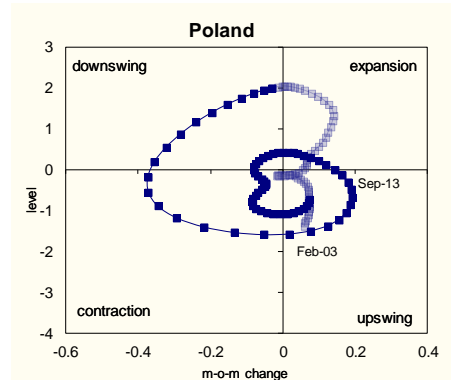
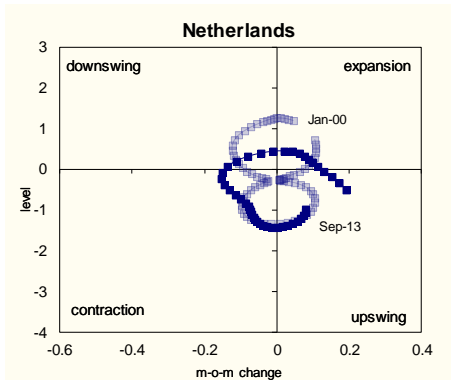
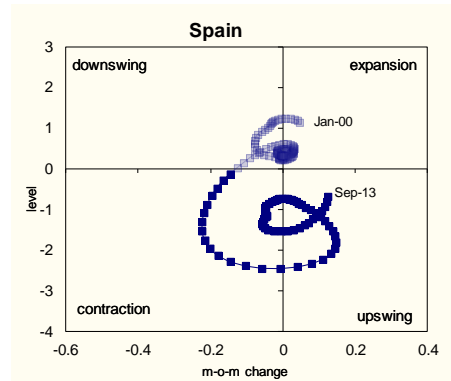
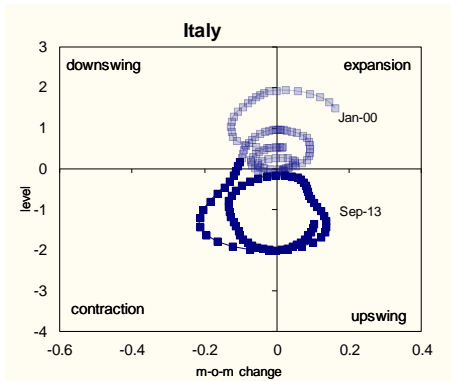
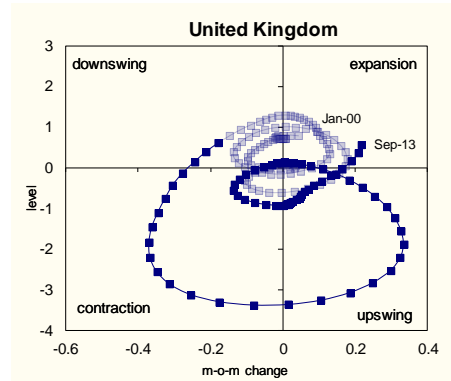
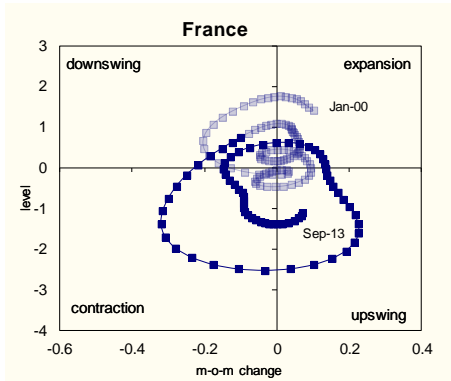
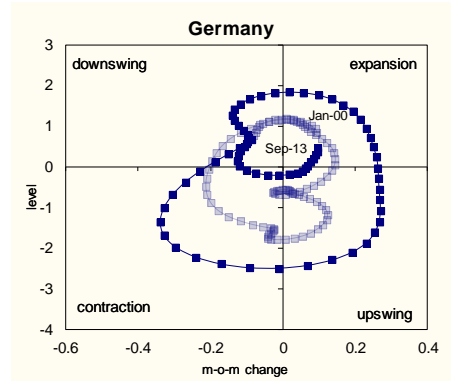
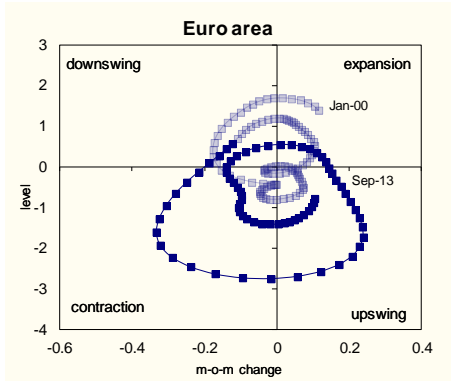
The four quadrants of the graphs enable four phases of the business cycle to be distinguished: "expansion" (top right quadrant), "downswing" (top left), "contraction" (bottom left), and "upswing" (bottom right). Cyclical peaks are positioned in the top centre of the graph, and troughs in the bottom centre.

In order to make the graphs more readable, two colours have been used for the tracer. The darker line shows developments in the current cycle, which in the EU and euro area roughly started in January 2008.

**Economic climate tracer across sectors, EU**



Economic climate, largest EU Member States



**Annex 2: 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.