European Commission

ISSN 2443-8049 (online)

European Business Cycle Indicators

4th Quarter 2015

TECHNICAL PAPER 005 | JANUARY 2016

EUROPEAN ECONOMY

Economic and Financial Affairs

European Economy Technical Papers are reports and data compiled by the staff of the European Commission's Directorate-General for Economic and Financial Affairs.

Authorised for publication by José Eduardo Leandro, Director for Policy Strategy and Coordination.

This document exists in English only and can be downloaded from http://ec.europa.eu/economy_finance/publications/eetp/index_en.htm or http://ec.europa.eu/economy_finance/publications/. It appears quarterly.

Luxembourg: Publications Office of the European Union, 2016

KC-BF-16-005-EN-N (online)
ISBN 978-92-79-54521-4 (online)
doi:10.2765/890855 (online)

KC-BF-16-005-EN-C (print)
ISBN 978-92-79-54520-7 (print)
doi:10.2765/094300 (print)

European Commission
Directorate-General for Economic and Financial Affairs

European Business Cycle Indicators

4th Quarter 2015

Special topic

- Forecasting turning points in private consumption growth - a closer look at specific components of the Consumer Confidence Indicator (CCI)

This document is written by the staff of the Directorate-General for Economic and Financial Affairs, Directorate A for Policy Strategy, Coordination, Unit A4 – Economic situation, forecasts, business and consumers surveys http://ec.europa.eu/economy_finance/publications/cycle_indicators/index_en.htm.

Contact: Christian.Gayer@ec.europa.eu.

CONTENTS

OVERVIEW

Recent developments in survey indicators

- Both the euro-area and the EU Economic Sentiment Indicator (ESI) increased over the last quarter of 2015. In December 2015, the ESI scored rather comfortably above the long-term average of 100 in both the euro area (at 106.8) and the EU (at 108.9).
- At euro area and EU sector level, confidence improved markedly among consumers and in the services and construction sectors, while industry confidence remained (broadly) unchanged and retail trade confidence worsened over the quarter.
- Compared to September's readings, the ESI brightened in four of the seven largest EU economies (France, Italy, Spain, and Poland). By contrast, the indicator weakened in Germany and the Netherlands and remained broadly unchanged in the UK.
- Capacity utilisation in the manufacturing sector remained stable in the EU while it increased somewhat in the euro area. In both areas it stands slightly above its respective long-term average. In the services sector, capacity utilisation increased in both areas, reaching the highest levels since the start of the publication of the indicator (July 2011).
- Manufacturing managers foresee positive growth rates for real investment in both European aggregates. For the euro area, managers expect a 2.6% increase for 2015 and a further 6.4% increase in 2016. For the EU, survey results point to a growth of 3.8% in 2015 and a further increase of 4.6% in 2016.

Special topic: Forecasting turning points in private consumption growth - a closer look at specific components of the Consumer Confidence Indicator (CCI)

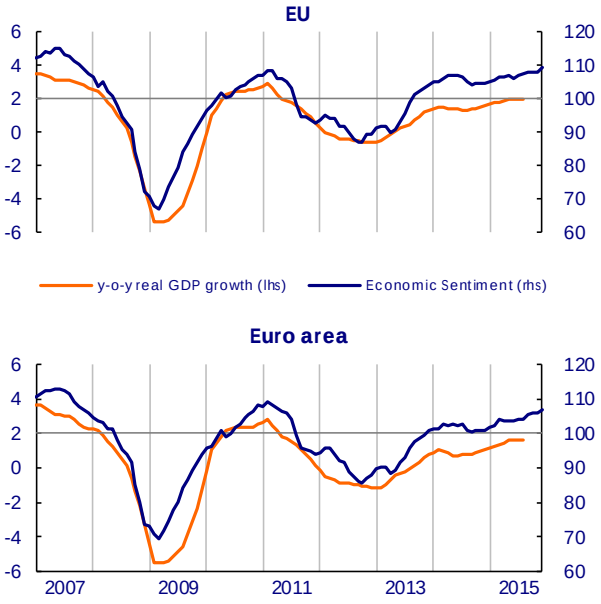
Following up on the analysis in the previous issue of the EBCI, this quarter's special topic investigates whether new ways of aggregating the results of the harmonised EU consumer survey can produce confidence indicators which are more powerful than DG ECFIN's established CCI in forecasting turning points in private consumption growth. Focussing on realistic forecasting scenarios (i.e. scenarios where the confidence indicators are used alongside available hard data), we find no evidence that a more sophisticated construction method and/or the use of a wider set of survey questions would produce consumer confidence indicators with a significantly better ability to forecast turning points in consumption growth. However, when re-constructing the new indicators solely on the basis of household-specific (micro) questions, such as households' financial situation, their savings plans, etc., the new indicators are shown to carry forecast-relevant information which is complementary to that in the hard data, and going beyond that contained in the CCI.

1. RECENT DEVELOPMENTS IN SURVEY INDICATORS

1.1. EU and euro area

In the last quarter of 2015, the EU and the euro-area Economic Sentiment Indicators (ESI) continued on the mild upward trend that has been discernible since the last quarter of 2014. At the end of 2015, the ESI scored rather comfortably above the long-term average of 100 in both the EU (at 108.9) and the euro area (at 106.8).

Graph 1.1.1: Economic Sentiment Indicator



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

Compared to the readings at the end of the third quarter of 2015, the ESI registered gains of around 1¼ points in both the EU and the euro area. After the broadly flat developments of October and November, these gains were essentially due to increases in the last month of 2015. The mild improvement over the quarter was broadly in line with developments in the Ifo Business Climate Index (for Germany) and Markit Economics' Composite PMI for the euro area.

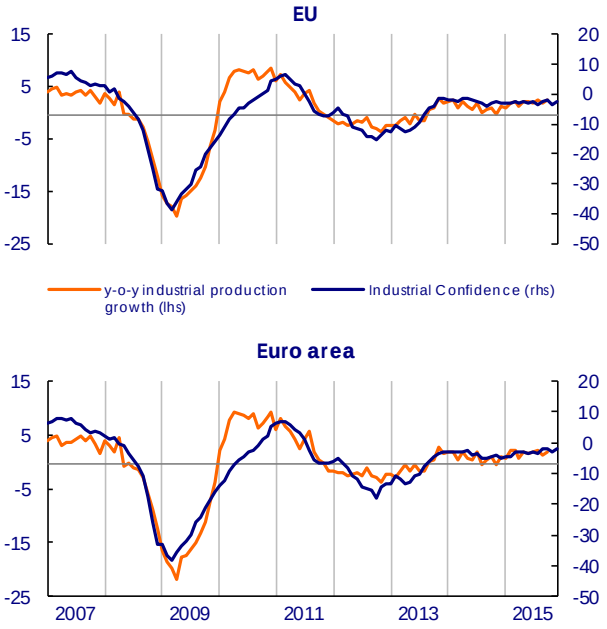
At EU and euro area sector level, the development of the sentiment indicator over the fourth quarter was fuelled by confidence increases among consumers and managers in the services and construction sectors. By contrast, the retail trade confidence indicator scored at a lower level than at the end of the third quarter 2015, while confidence in industry remained (broadly) stable. In terms of levels, all sectoral EU and euro area indicators currently score above their corresponding historical mean.

At country level, sentiment improved in four of the seven largest EU economies compared to September, namely in Spain (+2.9), France (+1.5), Poland (+1.0) and Italy (+0.6). The Netherlands (-1.7) and Germany (-0.8), by contrast, saw sentiment cooling down somewhat, while sentiment remained broadly unchanged in the UK (-0.2).

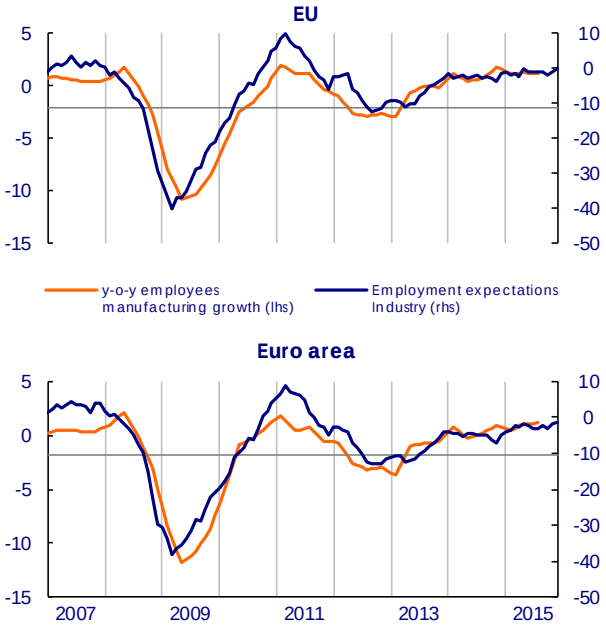
Sector developments

In both the EU and the euro area, confidence in the **manufacturing industry** fluctuated around a rather stable level over the fourth quarter of 2015. Small increases in October were followed by decreases in November and a renewed pick-up in December. On balance, a comparison of December's readings to those of September shows a (broadly) unchanged situation for the EU (0.0) and the euro area (+0.3).

Graph1.1.2: Industry Confidence indicator



Graph1.1.3: Employment - Industry Confidence indicator



Compared to the end of the third quarter, managers' production expectations worsened in both regions, while their assessments of both total and export order books improved. Their assessment of the stocks of finished products worsened slightly in the EU, while it improved marginally in the euro area. Also managers' appraisals of past production trends improved in the euro area, while remaining broadly stable in the EU. Due to an important downward revision in the last month of the quarter, managers' selling price expectations were broadly at the same level in December as in September in both areas.

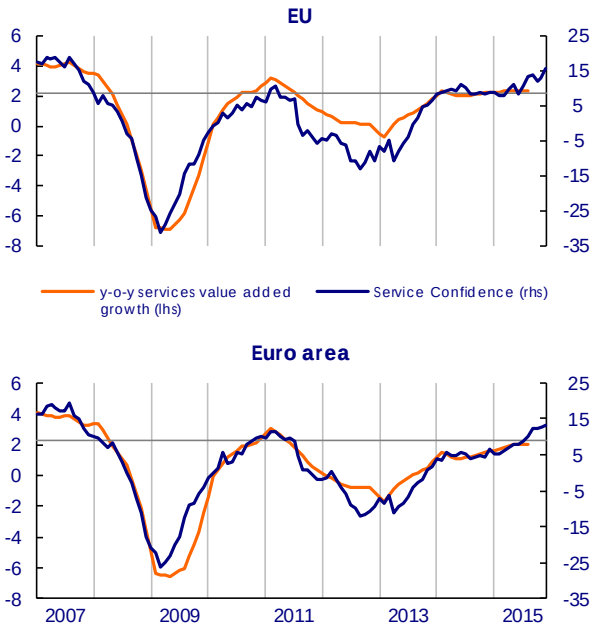
Industry managers' employment expectations improved slightly in December compared with September.

In the seven largest EU countries, compared to the end of the third quarter, industry confidence increased in France and Spain (by 1.3 and 1.6 points, respectively), while it remained broadly unchanged in Italy (-0.3). By contrast, confidence worsened strongly in the UK (-3.7) and less so in the Netherlands (-1.5), Germany (-0.7) and Poland (-0.4).

The latest readings from the quarterly manufacturing survey (carried out in October) showed that, compared to July 2015, ***capacity utilisation in manufacturing*** remained stable in the EU while it increased slightly by 0.4 percentage points in the euro area. The level of capacity utilisation stood at 81.2%, in the EU and 81.5% in the euro area, thus slightly above the long-term averages in both areas (EU 80.9%; euro area 81.2%).

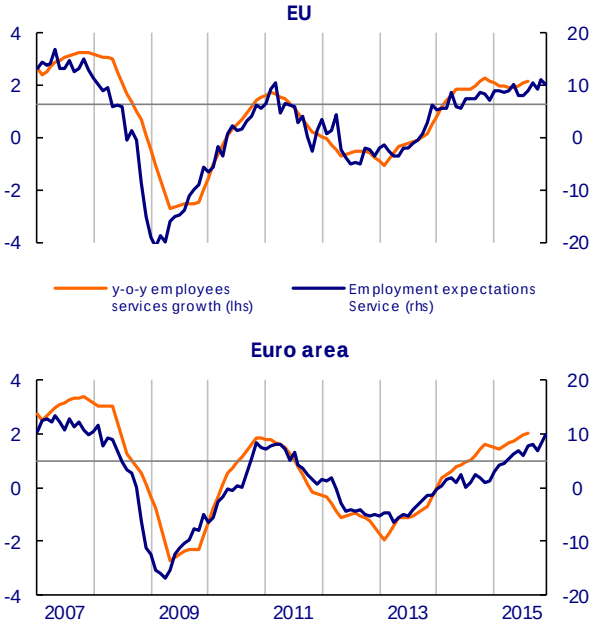
Over the third quarter of 2015, confidence in the **services sector** increased noticeably in the EU (+2.0) and slightly in the euro area (+0.7). Both indicators currently score above their historical averages. In the EU, the indicator decreased markedly in October and then registered two strong increases in November and December, while in the euro area, the slight increase was mainly due to a single uptick in November.

Graph1.1.4: Services Confidence indicator



As for the individual components of the confidence index, in both areas managers' demand expectations improved markedly, while theirs views on the past business situation improved in the EU but decreased somewhat in the euro area. Managers' assessment of past demand was unchanged in the EU in December compared with September, while it worsened in the euro area.

Graph1.1.5: Employment - Services Confidence indicator

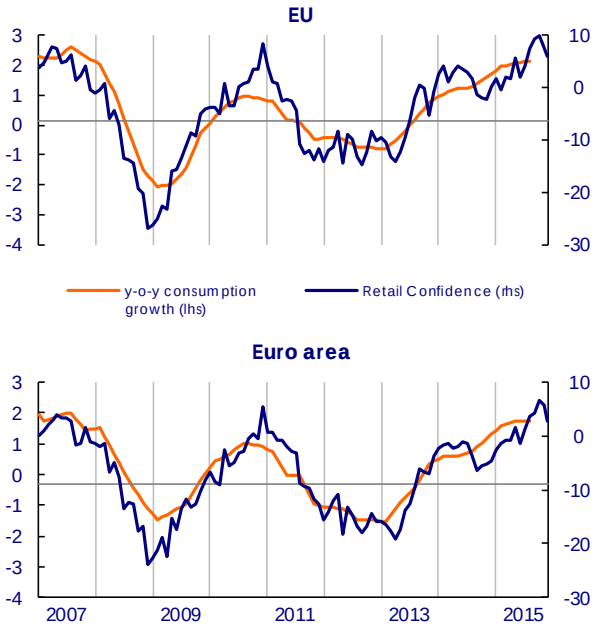


Looking at the largest EU countries, compared to September 2015, confidence improved markedly in the UK (+7.6), France (+3.9), the Netherlands (+3.4) and – to a lesser degree – Spain (+0.9). The indicator remained broadly unchanged in Poland (+0.3), while it decreased in Italy (-0.8) and Germany (-2.0).

Capacity utilisation in services has been on an upward trend since the beginning of 2013. In October 2015, it increased in both the EU (by 0.8 points to 89.2%) and the euro area (by 0.6 points to 88.7%), reaching the highest levels since the start of the publication of the indicator (July 2011).

In the last quarter of 2015, **retail trade** confidence decreased sharply in both the EU (-3.3) and the euro area (-1.4). The worsening resulted from two marked declines in November and December, which more than offset an increase registered in October.

Graph1.1.6: Retail Trade Confidence indicator

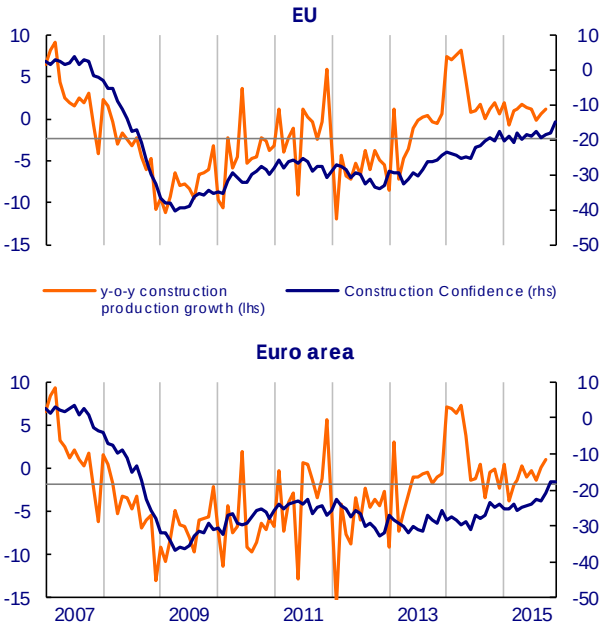


In both areas, managers' appraisals of the past and expected business activity weakened substantially, while their views on the adequacy of the volume of stocks improved. From a country perspective, confidence worsened significantly in the UK, France and Germany (-12.3, -9.5 and -3.0 points compared to September). By contrast, it improved strongly in Spain (+5.7) and, less strongly, in the

Netherlands (+1.9), Italy (+0.8) and Poland (+0.6).

Compared to September, confidence in **construction** improved sharply in both the EU and the euro area (by 4.5 and 5.6 points, respectively). From a month-on-month perspective, the indicator increased for three months in a row in the EU, while in the euro area it increased markedly in October and November and paused in December. In both areas, the indicator now stands above its long-term average.

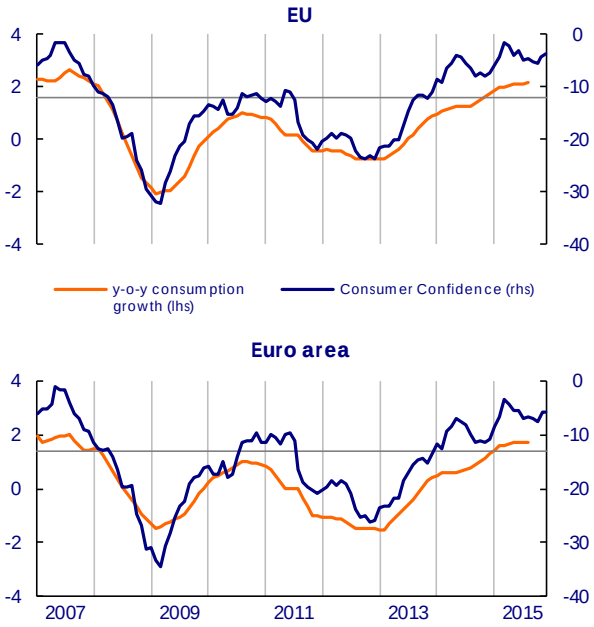
Graph1.1.7: Construction Confidence indicator



Both components of the indicator - managers' views on current order books and their employment expectations – improved markedly. Focusing on individual countries, the indicator rose in all the seven largest EU Member States. The indicator increased dramatically in Spain (+15.2). Important gains were booked also in Germany (+6.1), the Netherlands (+5.3), Poland (+3.1) and France (+2.7), while in the UK and Italy the indicator increase moderately, by 1.0 and 0.8 points respectively.

In both the EU and the euro area, confidence among **consumers** improved markedly in the fourth quarter of 2015, mainly resulting from an important improvement in November.

Graph1.1.8: Consumer Confidence indicator

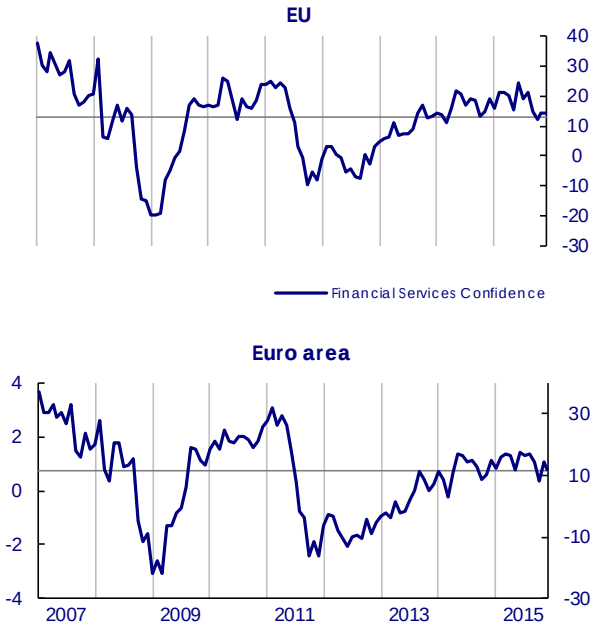


This result was backed by strong improvements in three of the four components of the indicator (consumers' expectations about their personal financial situation, the general economic situation and savings); only consumers' unemployment expectations remained stable in the EU and worsened in the euro area. At country level, confidence improved markedly in Spain (+8.0), Italy (+4.4), the UK (+3.7) and Poland (+3.3), while it worsened in the Netherlands (-2.7), Germany (-1.3) and France (-1.0).

While there is no apparent impact from the Paris terror attacks on overall consumer confidence, consumers seemed to be wary of the possible fallout of the refugee crisis on national labour markets in the countries most concerned: unemployment expectations of German and Austrian consumers soared since the summer, suggesting growing concerns about the possibility of the influx of asylum seekers driving up unemployment. At the end of 2015, German unemployment expectations remained at the highest level since December 2012.

EU and euro-area confidence in **financial services** (not included in the ESI) worsened somewhat over the last quarter of 2015. The decline resulted from managers' more negative views on the past business situation and expected demand, while managers' assessment of past demand improved.

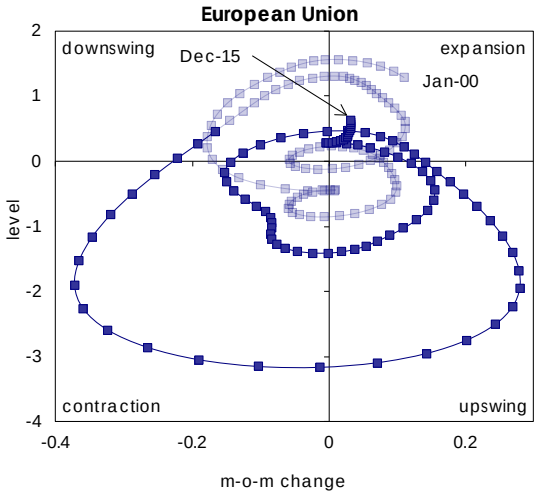
Graph1.1.9: Financial Services Confidence indicator



Climate tracers

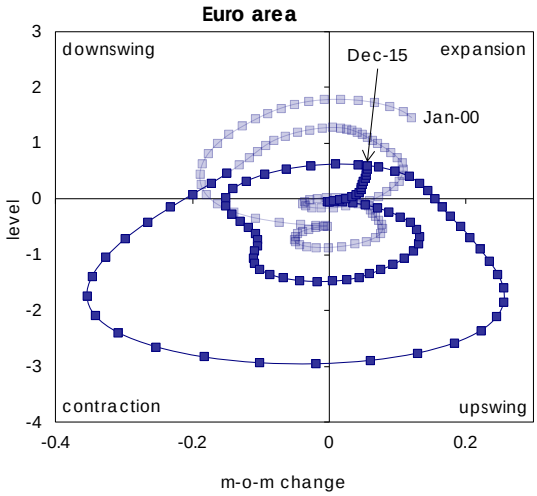
The developments in survey data over the fourth quarter are illustrated by the evolution of the **climate tracers.** The economic climate tracer for the EU moved further into the expansion quadrant.

Graph 1.1.10: EU Climate Tracer



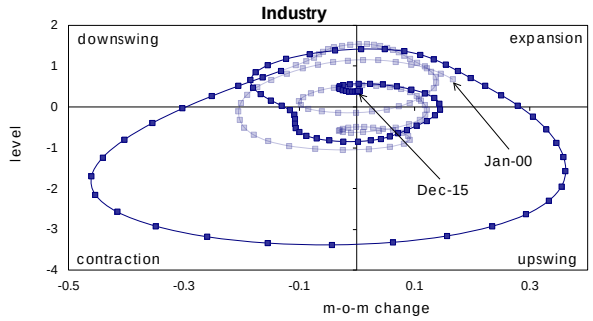
This movement was driven mainly by the climate tracers for consumers and services which moved deeper into the expansion area, and for construction, which is just at the border between the upswing and expansions areas and pointing to the latter one. The tracer for retail trade also remains in the expansion quadrant but has started to bend towards the downswing quadrant. The climate tracer for industry stayed in expansion, but remains very close to the border with the downswing quadrant. Also for the euro area, the overall economic climate tracer is now located deeper in the expansion quadrant. At sector level, movements are very similar to the described EU developments.

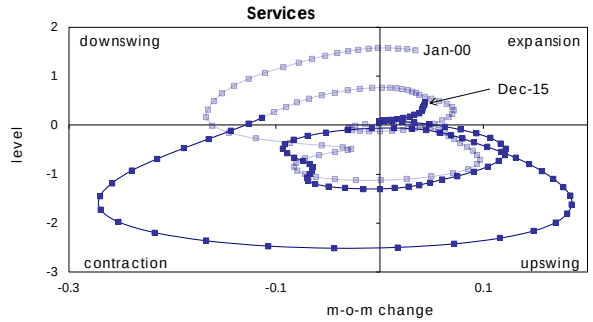
Graph 1.1.11: Euro area Climate Tracer

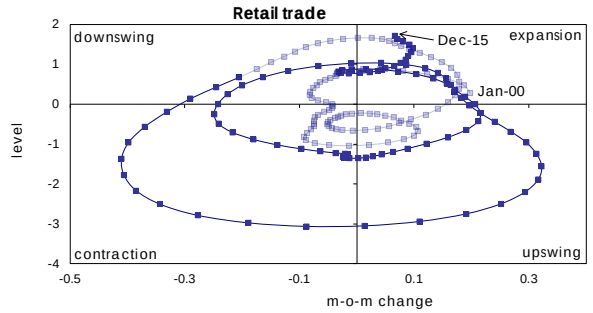


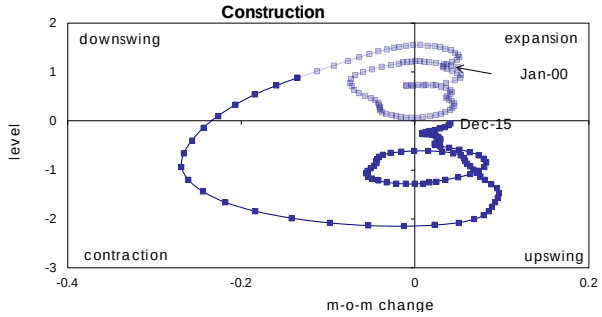
Graph 1.1.12: Economic climate tracers across sectors

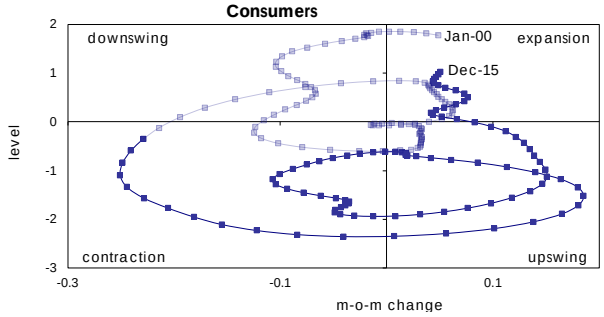
EU



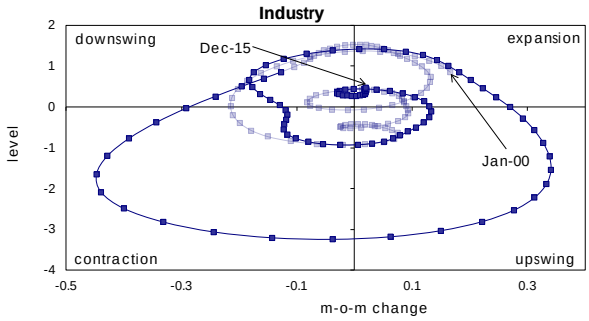


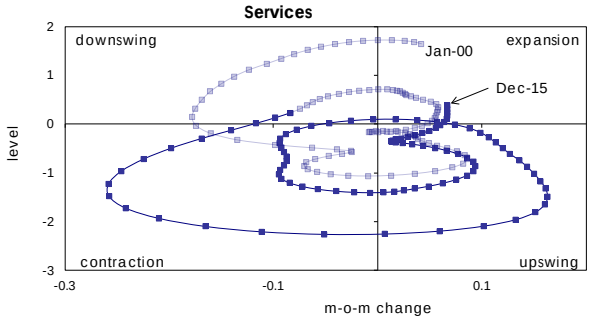


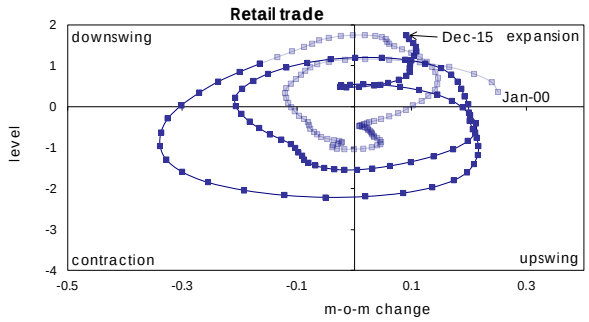


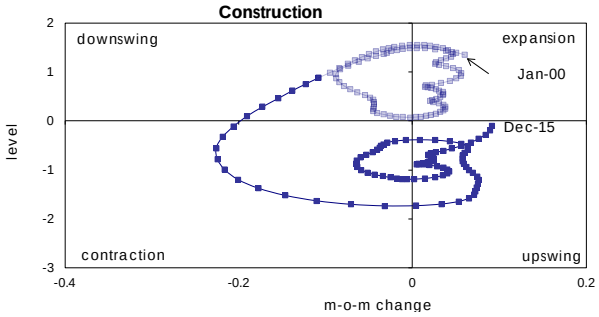


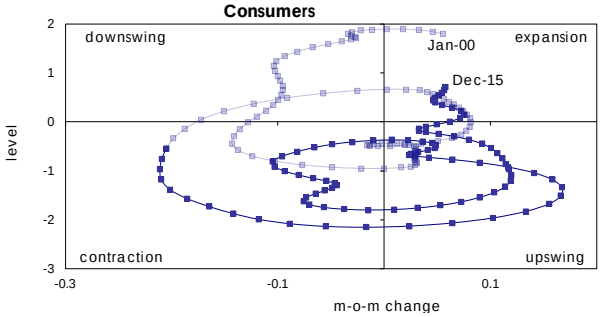
Euro area









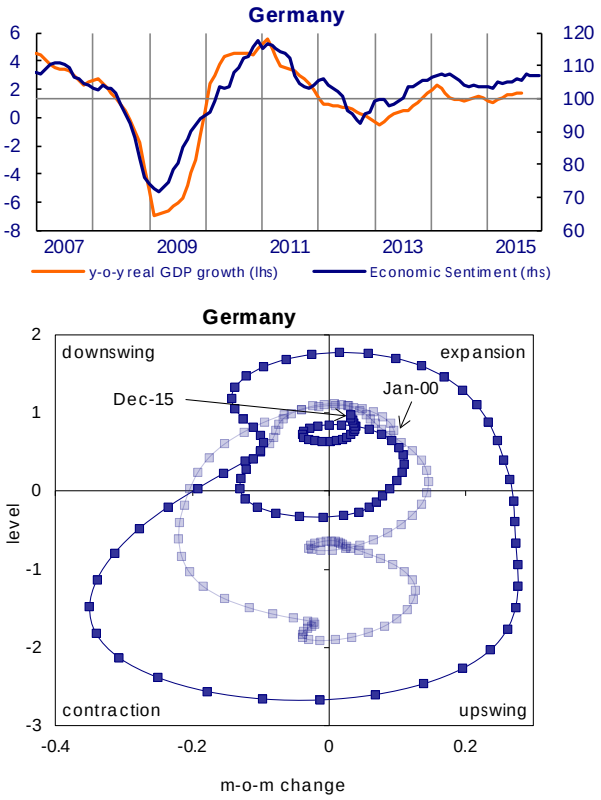


1.2. Selected Member States

During the fourth quarter of 2015, sentiment has improved strongly in Spain and France and - to a lesser extent - in Poland and Italy, while it has deteriorated in the Netherlands and Germany and remained stable in the UK. The sentiment index scored above its long-term average in all the seven largest Member States but Poland.

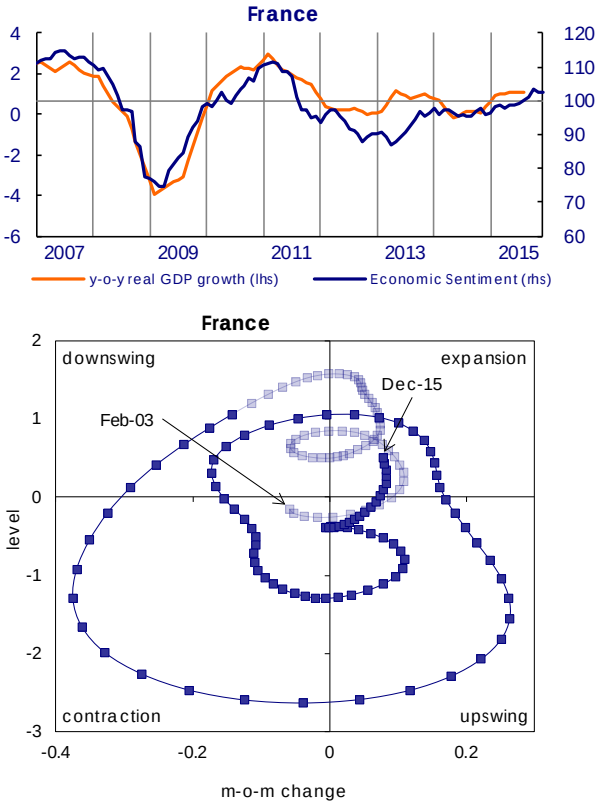
In **Germany,** the ESI slightly decreased in the fourth quarter compared to the end of the third quarter (-0.8). This resulted from a decrease in October followed by stable developments in November and December. Despite the small drop, the indicator remains well above its long-term average of 100, at 106.9 points. Confidence improved markedly in construction, while it worsened in industry, services, retail trade and among consumers. In terms of the climate tracer, Germany remains in the expansion quadrant, indicating further firm growth.

Graph 1.2.1: Economic Sentiment Indicator and Climate Tracer for Germany



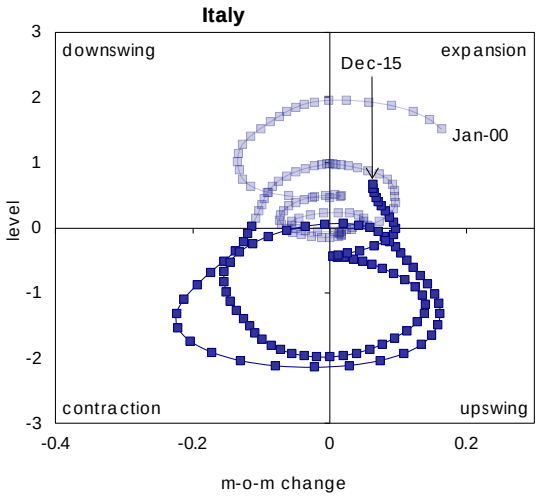
Economic sentiment in **France** improved over the first quarter (+1.5); the indicator increased strongly in October, decreased somewhat in November and remained stable in December. At 102.5 points the sentiment index is now confidently above its long-term average of 100. Confidence improved strongly in services and, to a lesser extent, in industry and construction, while it worsened somewhat among consumers and plummeted in retail trade. The slump in retail trade confidence was led by a significantly worsened assessment of the past business situation in December, testifying to weaker Christmas sales in the aftermath of the Paris terror attacks. Overall, the climate tracer has been moving deeper into the expansion quadrant, implying further positive growth dynamics.

Graph 1.2.2: Economic Sentiment Indicator and Climate Tracer for France



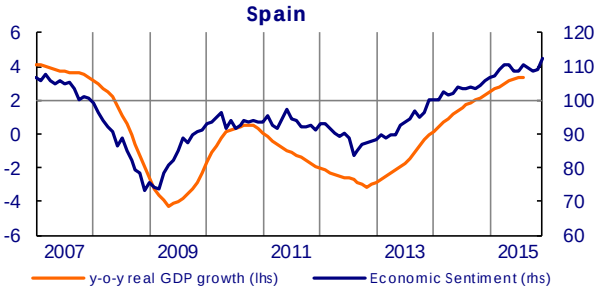
Sentiment in **Italy** rose in October, decreased in November and picked up again in December, resulting in a minor increase compared to September (+0.6). The sentiment index is now well above its long-term average of 100, at 109.8 points. At sector level, confidence improved markedly among consumers and slightly in the retail trade sector. By contrast confidence worsened slightly in services and construction and remained broadly unchanged in industry. The climate tracer moved deeper into the expansion area, indicating steady growth dynamics.

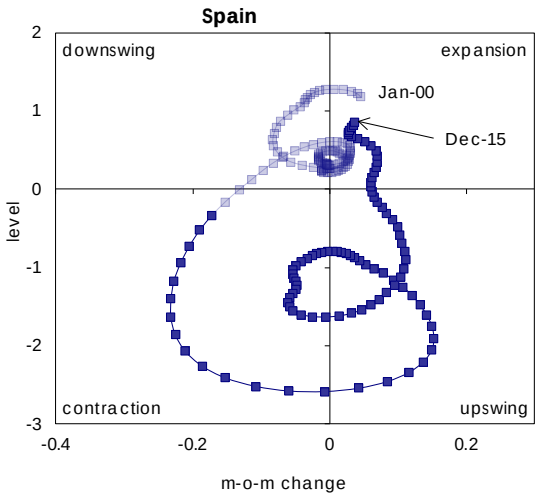
Graph 1.2.3: Economic Sentiment Indicator and Climate Tracer for Italy



The ESI for **Spain** improved strongly compared to September (+2.9), thanks to an important gain registered in the last month of the quarter. At 112.4 points, the sentiment indicator is soundly above its long-term average of 100. Confidence improved in all business sectors and among consumers. Gains were particularly strong in construction but also very important in retail trade and among consumers. Notably, the confidence indicators in retail trade and among consumers reached their historical highs in December (at +17.0 and +5.4, respectively). Overall, the fourth quarter reconfirms Spain's position in the expansion quadrant of the climate tracer and sustained growth dynamics.

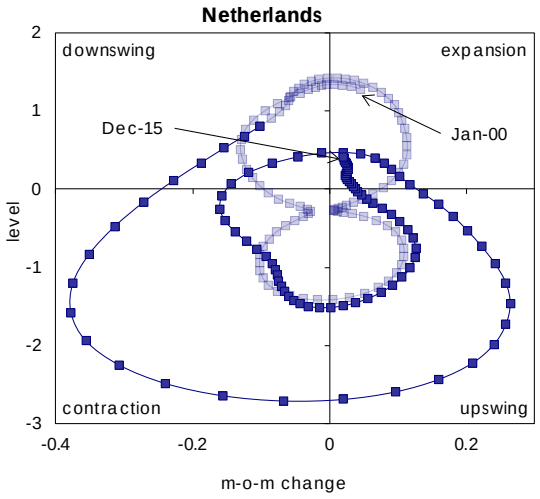
Graph 1.2.4: Economic Sentiment Indicator and Climate Tracer for Spain





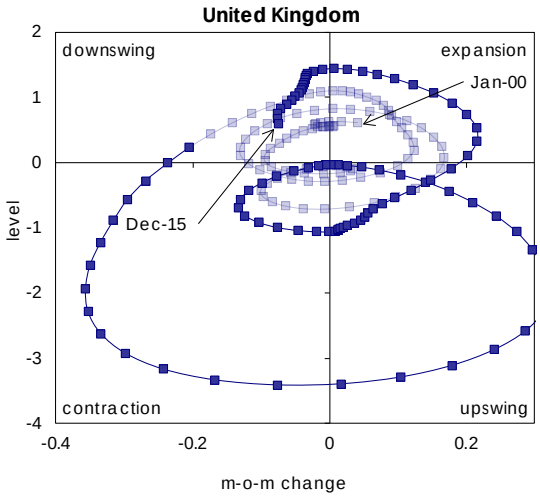
In the **Netherlands**, sentiment worsened over the last quarter of 2015 (-1.7). The ESI decreased in October, recovered in November but dropped again in December. At 104.4, the indicator remains above its long-term average. At sector level, confidence worsened in industry and among consumers, while it improved in services, retail trade and construction. The climate tracer for the Netherlands remains in the expansion quadrant, but is pointing to the downswing area.

Graph 1.2.5: Economic Sentiment Indicator and Climate Tracer for the Netherlands



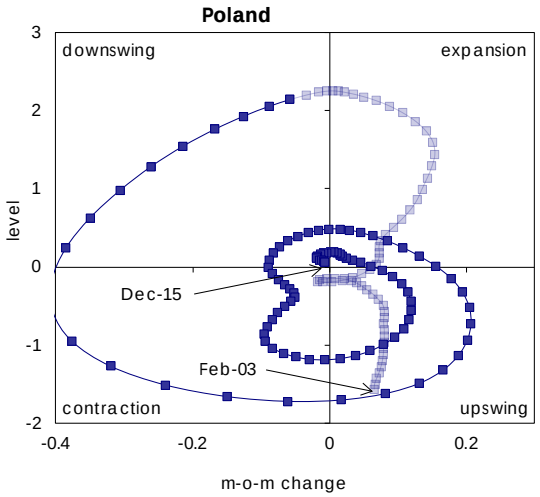
In the **United Kingdom**, sentiment remained broadly unchanged in the last quarter compared to September 2015, resulting from two marked drops in October and November levelled off by a strong increase in December. The indicator remains well above its long-term average of 100, at 110.6. Stable sentiment resulted from strong downward revisions in industry and retail trade being offset by marked improvements in services, construction and among consumers. The climate tracer's position in the downswing quadrant suggests strong but decelerating growth dynamics.

Graph 1.2.6: Economic Sentiment Indicator and Climate Tracer for the United Kingdom



Economic sentiment in **Poland** recorded a mild improvement over the fourth quarter compared to September 2015. Having improved in October and November, it registered a partial relapse in December. The ESI thereby continues to score below its long-term average, at 98.7. At sector level, confidence remained broadly stable in industry and services. By contrast it improved in construction and among consumers and, slightly, in retail trade. The Polish climate tracer is currently pointing to a neutral positon in the zero-point of the diagram.

Graph 1.2.7: Economic Sentiment Indicator and Climate Tracer for Poland



1.3. Results of the autumn 2015 EU Investment Survey in the manufacturing sector

Developments in overall investment

According to the latest Investment Survey carried out in October/November 2015, real manufacturing investment in the euro area is expected to have increased by 2.6% in 2015 compared with 2014. Concerning 2016, manufacturers expect a further increase in investment by 6.4%. Compared with the previous survey conducted in March/April 2015, managers revised downwards their assessment for 2015 (by 2.3 pp). Managers in the EU anticipate an increase of 3.8% for investments in 2015 (down from 5.2% in March/April) and expect a further increase of 4.6% for 2016.

The results from the investment survey are not directly comparable with available Eurostat figures on investment growth. The Investment Survey covers only investment by manufacturing companies and therefore only roughly 40% of total investment[1] in the economy; a Eurostat breakdown for investment in the manufacturing sector is not available. Instead, investment in equipment[2] can be used as a rough proxy for investment activity in the manufacturing sector.

Compared to total investment, investment in equipment typically reacts stronger to the business cycle, a feature that is likely also for manufacturing investment. Nevertheless, there is no full congruency between the two concepts.

Graph 1.3.1 presents manufacturing managers' estimates of investment growth for 1998-2014 (surveyed in March/April of each subsequent year) along with Eurostat estimates for total

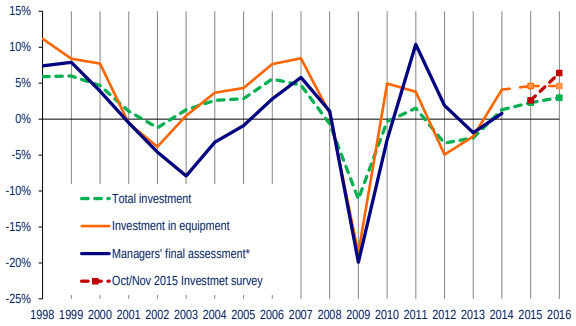
[1] In this publication, 'total investment' corresponds to Eurostat data for gross fixed capital formation (GFCF) in total fixed assets, in volume terms.

[2] 'Investment in equipment' corresponds to Eurostat data for GFCF in 'machinery and equipment and weapons systems', in volume terms.

investment and investment in equipment in the euro area, plus the respective Autumn Commission forecasts and the latest survey result for 2015 and 2016.

Until 2002, manufacturing managers' assessments were quite close to the outcomes of the two investment series. Between 2003 and 2006, managers underestimated past investment growth. Prior to the crisis in 2007 and up to 2010, the graph shows a good fit between the series again, apart from the underestimation by manufacturing managers of the recovery in machinery and equipment investment dynamics in 2010. For 2011 and 2012, the results from the Investment Survey were significantly above the Eurostat figures, while for 2013 and 2014, results were closely aligned again. Currently, manufacturing managers' plans in 2015 (+2.6%) are broadly in line with the Commission's Autumn forecasts for total investment (+2.3%)[3] and slightly lower than the Commission's Autumn forecasts for investment in equipment (+4.6%), while for 2016 manufacturing managers are somewhat more optimistic than the Commission's Autumn forecasts for both total and equipment investment (+3.0% and +4.6%, respectively).

Graph 1.3.1: **Investment growth in the euro area (annual changes in %, in volumes)**



Note: Total and equipment investment data for 2015 and 2016 are Commission's Autumn forecasts. *Mar/Apr year t surveys, managers' assessment of investment in year t-1.
Source: Commission services.

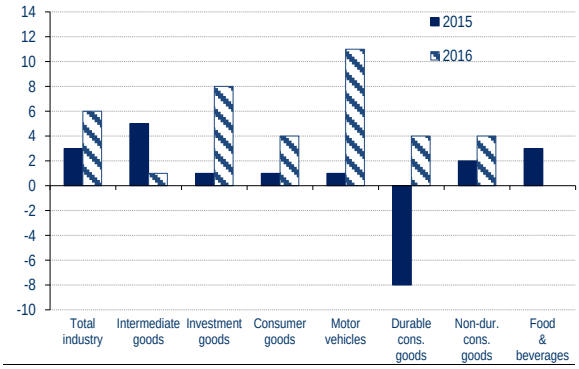
[3] Available data for total investment in the first three quarters of 2015 indicate annual growth rates of +2.2% for the EA and 2.8% for the EU.

Investment dynamics by sectors in the euro area

Looking at the sectoral breakdown of the survey (see Graph 1.3.2), managers in all three sectors reported to have registered an increase in investment in real terms in 2015: of 1.0% in the investment and consumer goods sectors and of 5.0% in the intermediate goods sector. Managers in the motor vehicle sector – which is part of the investment goods sector – estimated an increase in investment of around 1.0%. The increase in the consumer goods sector is the result of a decrease of 8.0% in the durable consumer goods sector and an increase of 2.0% in the non-durable consumer goods sector. Within the latter, investment increased by 3.0% in the food and beverages sub-sector.

Also for 2016, managers in all three sectors expect to increase their investment: by 1.0% in the intermediate goods sector, 8.0% in the investment goods sector and 4.0% in the consumer goods sector. At sub-sector level, investment in both the durable and non-durable consumer goods sectors is forecast to increase further by 4.0%. Investment is foreseen to increase strongly in the motor vehicle branch (+11.0%) of investment goods while in the food and beverages branch investment should remain unchanged.

Graph 1.3.2: **Surveyed change of investments in the euro area by sectors (annual % changes)**



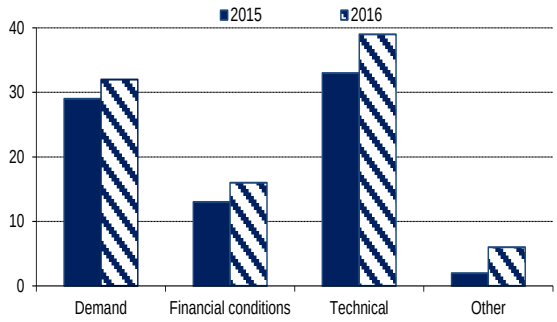
Source: Commission services.

Factors influencing investments

The autumn Investment Survey also provides information on the factors influencing investment, namely: demand, financial resources (availability and cost of financing, opportunity costs of investment, etc.),

technical (e.g. technological developments and the availability of labour) and other factors (e.g. taxation and the possibility of moving production abroad).

Graph 1.3.3: **Factors influencing investment in the euro area (balance statistic*)**



*Balances are the weighted averages of the percentages of answers describing each factor as 'very stimulating' (coefficient 1), 'stimulating' (0.5), 'limiting' (-0.5) and 'very limiting' (-1).
Source: Commission services.

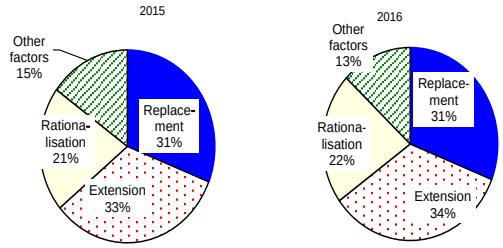
For both 2015 and 2016, all the factors are reported as stimulating investment in the euro area (see Graph 1.3.3). In addition, all the four factors became more supportive in 2015 compared with 2014 and are expected to stimulate investment even more positively in 2016.

Investment structure

Firms are also asked to assign their investments to four categories: replacement of worn-out plant or equipment, extension of production capacity, investment designed to streamline production (rationalisation), and other investment objectives (pollution control safety, etc.).

For 2015, the largest share of investments has gone to extension purposes (33%), followed by replacement (31%), rationalisation (21%) and other objectives (15%). Compared to 2014 there has been a slight shift from 'other' and extensions purpose to replacement and rationalisation objectives. The structure of investment is expected to change only marginally in 2016: the largest share of investments will continue to serve extension purposes (34%), followed by replacement investment (31%) and rationalisation (22%). Only 13% will be used for other investment objectives (see Graph 1.3.4).

Graph 1.3.4: **Investment structure in the euro area (percentage of total investment)**



Source: Commission services.

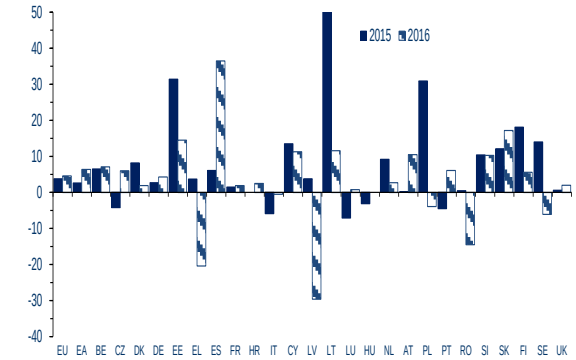
Developments by country

At country level, the picture is rather positive for both 2015 and 2016 with managers in most countries reporting an increase in real investment. For 2015 only three countries in the euro area and five in the EU have reported decreases. For 2016 the number of countries expecting a decrease remained at three in the euro area and slightly increases to six in the EU (see Graph 1.3.5).

Manufacturing managers assessed their investment in 2015 to have increased in all the largest Member States except for Italy (-6%). Investments are estimated to have risen strongly in Poland (+31%), the Netherlands (+9%) and Spain (+6%), and to a lesser extent, in Germany (+3%), France (+2%) and the UK (+1%).

For 2016, managers in Germany, Spain, France, the Netherlands and the UK expect to further increase their investment by, respectively, 4%, 37%, 2%, 3% and 2%. Investments are expected to increase strongly in Spain thanks to an important increase in the motor vehicle sector (+51%). Investment is foreseen to slightly contract further in Italy (-1%), and to decrease somewhat more markedly in Poland (-4%).

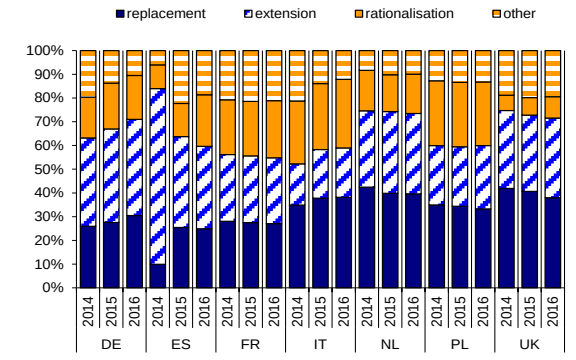
Graph 1.3.5: **Surveyed change of investments in the EU Member States (annual changes in %)**



Source: Commission services.

The structure of investment in 2015 varies across countries (see Graph 1.3.6). Investment has mainly served extension purposes in Germany and Spain. In France extension investment has been as important as replacement investment, while in Italy, the Netherlands, Poland and the UK investment has been driven mainly by replacement needs. For 2016 the picture remains broadly the same.

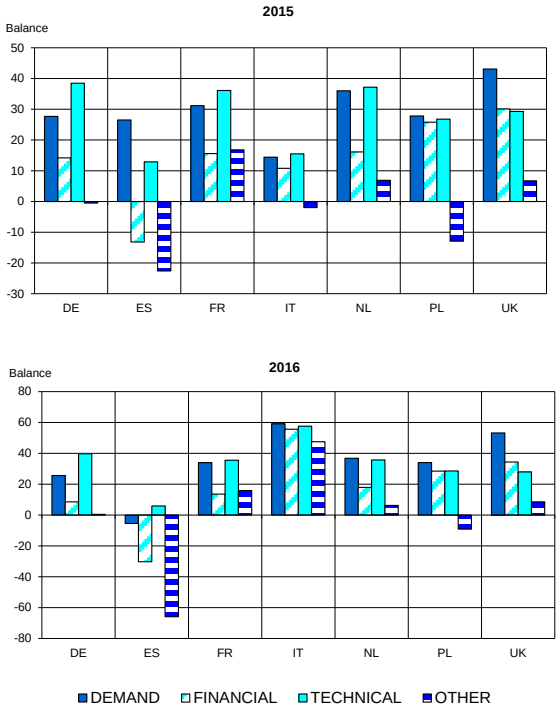
Graph 1.3.6: **Structure of investments in the big Member States in 2014, 2015 and 2016 (share in %)**



Source: Commission services.

Graph 1.3.7 shows which factors are stimulating or limiting investment in the largest Member States in 2015 and 2016. For 2015, demand, financial conditions and technical factors were considered as stimulating investment in all the large Member States except for Spain where financial conditions were assessed as a limiting factor. Other factors (e.g. taxation and the possibility of moving production abroad) were seen as limiting in Spain, Italy, and Poland but as stimulating in France, the Netherlands, and the UK. In Germany 'other factors' were considered as neither limiting nor stimulating. These patterns change very little for 2016. The main exceptions are Spain, where managers expect demand to become limiting investments, and Italy, where 'other factors' become supportive of investment.

Graph 1.3.7: **Factors influencing investment decisions in large EU Member States in 2015 and 2016 (balance statistic)**



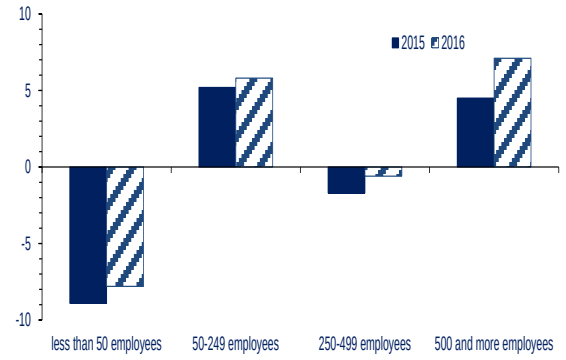
Source: Commission services.

A closer look at developments in investment by enterprise size

According to the survey, both very large firms (employing more than 500 people) and medium-sized enterprises (employing between 50 and 249 people) experienced an expansion in real investment in 2015 of 5% (see Graph 1.3.8). By contrast, small and large-sized enterprises (respectively, those employing up to 50 and between 250 and 499 people) experienced a decrease of around 9% and 2%, respectively.

For 2016 this structure remains unchanged: while managers of small and large-sized firms expect a further decrease of, respectively, 8% and 1%, very large and medium enterprises project to further increase their investments by 7% and 6%, respectively.

Graph 1.3.8: **Surveyed change of investments in the euro area by company size (annual % changes)**



Source: Commission services.

As visible in Graph 1.3.9 - which shows the breakdown by size of enterprises across countries - the decrease in 2015 among small enterprises is mainly due to a strong decline (-17%) for small enterprises in Germany and to a lesser degree to decreases in Spain and Italy. The small decrease among large firms is mainly due to decreases in Germany (-6%) and Italy (-9%). Investments for medium enterprises were particularly strong in Germany, the Netherlands and Poland, while Spanish and Italian managers reported a decrease in investment for 2015 compared with 2014. Concerning very large firms, investments should have increased in all the large Member States, expect for the UK (-6%). Growth is assessed to have been particular strong in Poland (+28%).

For 2016, the decrease expected among small firms results from decreases in Germany, Spain and Poland, while managers of small enterprises in France, the Netherlands and the UK expect to increase their investments. Concerning the medium-size class, the planned increase results from positive assessments in Germany, France, the Netherlands and the UK. By contrast medium firms in Spain, Italy and Poland expect investment to decrease in 2016. The decrease among large firms is due to decreases in four of the largest Member States (all except Germany, France and the UK). Finally, for very large enterprises expectations are generally positive with only managers in the UK expecting a minor decrease. The increases are expected to be particularly important in Spain and Poland.

Graph 1.3.9: **Surveyed change of investments in large EU Member States by size (annual % changes)**

Source: Commission services.

Conclusions

The results from the autumn Investment Survey in the manufacturing sector indicate that euro-area and EU real investment has risen in 2015 and is foreseen to increase further in 2016. Manufacturing managers' plans in 2015 (+2.6% for the EA and +3.8% for the EU) are slightly higher than the annual growth rates of total investment calculated over the first three quarters of 2015 (+2.2% for the EA and 2.8% for the EU). Real investment is expected to increase across all sub-sectors (intermediate, investment and consumer goods) in both the euro area and the EU in 2015 and 2016. At the size level, the picture is generally more positive for very large and medium enterprises then for small firms. The largest share of investment is reported to serve extension needs in both 2015 and 2016. Finally, managers consider that demand, financial resources, technical and other factors are stimulating investment in both 2015 and 2016.

2. SPECIAL TOPIC: FORECASTING TURNING POINTS IN PRIVATE CONSUMPTION GROWTH - A CLOSER LOOK AT SPECIFIC COMPONENTS OF THE CONSUMER CONFIDENCE INDICATOR (CCI)

Introduction

Departing from the observation that the consumer confidence indicator (CCI) regularly published by DG ECFIN of the European Commission is constructed in an ad-hoc way (simple averaging of four questions from the harmonised EU consumer survey), the special topic in the last edition of the European Business Cycle Indicators (EBCI 2015q3) investigated whether (i) the application of more elaborate statistical methods and (ii) the use of a wider set of consumer survey questions could produce superior indicators. Rather than restricted to four survey questions aggregated at euro area (EA) level, the new indicators were derived from the balance series of eleven survey questions from ten different EA countries, which together account for some 97% of EA real private consumption. Each indicator represented a different statistical aggregation method, namely principal components analysis (PCA), partial least squares (PLS) and ridge regressions (RR). The resulting indicators were shown to move largely in lockstep with the existing CCI. The picture was confirmed when examining the directional accuracy of the competing indicators in tracking private consumption. By the same token, a pseudo out-of-sample exercise focussing on the ability of the individual indicators to predict turning points (in real private consumption) showed a similar performance for all four indicators.

Building on the preliminary conclusion that there seem to be no major quality differences between the established CCI and the discussed alternative measures, the present analysis inquires whether this assessment holds true in a more ambitious forecast simulation exercise. Rather than examining the indicators' forecasting performances in models relying exclusively on consumer confidence measures, we repeat the analysis, this time including a number of potentially relevant and timely hard data series in the forecasting equations (interest rates, inflation, etc.). Arguably only such a test allows shedding light on whether, in a realistic forecasting situation, any of the alternative indicators is more useful than the CCI.

With the results of our analysis failing to identify any significant value added of the alternative indicators, we take a critical view at their construction principles. While not discarding the idea that their derivation from a broader set of survey questions might render them more effective, our attention focusses on whether certain types of questions might carry more predictive power than others. Practically, we reproduce all three indicators (PCA-, PLS- and RR-based), using only certain sub-sets of questions for their construction. All steps of the forecasting simulation exercise are subsequently repeated on these new indicators. As our analysis shows, there is, indeed, a subset of (household-specific) survey questions allowing for the production of confidence indicators which are more powerful than the CCI in forecasting turning points in private consumption.

The data and econometric set-up

Same as in the special topic of the 2015q3 edition of the EBCI, the variable to be forecast is a binary one, with 1 standing for recessionary and 0 for expansionary phases in EA real private consumption growth. The variable is constructed by (i) extracting the cycle from the consumption variable by means of the Christiano-Fitzgerald method, filtering out fluctuations shorter than 6 quarters and longer

than 32 quarters, and (ii) applying the Harding-Pagan procedure to the resulting time-series.[4]
The construction of the predictor variables (i.e. the established CCI, as well as the three alternative consumer confidence indicators) has been extensively described in the previous special topic. For the purpose of our forecast simulation exercise, all indicators are expressed as changes in their quarterly averages.

In contrast to the analysis in the previous EBCI, our exercise is augmented in the sense that it includes hard data series among the predictors, notably a short-term interest rate (3-month euribor, *str*), a European stock market index (Euro Stoxx 50, *stk*), as well as the harmonised index of consumer prices in the EA (*cpi*). All of them are expressed in quarterly averages, whereby the former remains in levels, while the latter two variables are log-transformed before computing the first difference of y-o-y changes.

We test the forecasting abilities of the four alternative confidence indicators in the framework of the following equation,

$$\text{Prob}[R_t=1]=f\{cc_t, str, stk, cpi\} \quad (1)$$

where *cc* represents either the established CCI, the PCA-, PLS- or RR-based indicator. The out-of-sample simulation is conducted in pseudo real-time, meaning that, at every stage of the forecasting exercise, the historic data-availability conditions are replicated. All in all, 40 forecasts are conducted, corresponding to one forecast per quarter over the period 2005q2 to 2015q1.[5] In every quarter, it is assumed that the forecast is conducted at the end of month 3 of the quarter. At that point in time, each of the predictor variables features three monthly readings for the quarter under investigation, [6] while the latest available score of the recession probability (=dependent variable) refers to t-1.
Once the different models are run, the analysis proceeds to a comparison of their forecasting performances. As pointed out by Liu and Moench (2014), a formal comparison of the predictive ability of alternative probit specifications is quite problematic since the probability of a recession implied by the models is rarely exactly zero or one.[7] Thus, a cut-off (e.g. 0.50) is usually adopted such that a predicted probability above the cut-off is classified as a recession. Obviously, the choice of the cut-off can have a significant bearing on which model performs best.

In order to overcome this problem, we construct for every model a receiver operating characteristic (ROC) curve.[8] The idea is to plot the rate of false positives (x-axis) against the rate of true positives (y-axis) for different cut-off values (from 0 to 1). The intuition is that a good model will always be above a virtual 45 degrees line, separating the x- and y-axis, since it will produce a higher *true* positive than false positive rate. To assess which model is best, irrespective of the choice of the cut-off value, we compare the integrated area under (AU) the ROC curve. The larger the area, the better the model. Generally, a model with an AUROC larger 0.5 performs better than a random guess model, which would, on average, produce an equal number of true and false positives and thus have an AUROC of 0.5.

[4] See Harding, D. and Pagan, A. (2002), "Dissecting the Cycle: A Methodological Investigation", *Journal of Monetary Economics* 49, pp. 365–381; Christiano, L. and Fitzgerald, T.J. (2003), "The bandpass filter", *International Economic Review* 44, pp. 435-465; Stock, J.H. and Watson, M.W. (2005), "Understanding Changes in International Business Cycle Dynamics", *Journal of the European Economic Association* 3, pp. 968- 1006.

[5] The in-sample period consists of a rolling window of 36 quarterly observations.

[6] The *cpi* variable is an exception. Due to its delayed publication, only the readings of the first two months of a given quarter are available by the end of that quarter. Accordingly, in our forecasting exercise, the average of the first two months (rather than all three months) of a given quarter is taken into account when constructing the quarter-on-quarter differences of *cpi*.

[7] Liu W. and E. Moench, (2014), "What Predicts U.S. Recessions?", Federal Reserve Bank of New York Staff Reports 691.

[8] See, for instance, Jordà, O., and Taylor, A.M. (2011), "Performance evaluation of zero net-investment strategies," NBER Working Paper 17150.

Results: evidence from the entire set of questions from the consumer survey

Table 2.1 (left panel) reports the AUROCs for forecasts based on equation (1), with each row of the table representing the use of a different type of consumer confidence indicator in the model. As was to be expected, the AUROCs of all models are significantly above those reported in the previous EBCI's special topic (above 0.7). The addition of hard data to the models thus seems to pay off in terms of their ability to predict turning points in private final consumption growth.

In a next step, we test whether there are statistically significant differences in the AUROCs of the different models. As the p-values in the right panel of Table 2.1 show, none of the models is statistically superior to that relying on the CCI (and hard-data). A first preliminary conclusion is thus that, even in a realistic forecasting scenario, i.e. one where consumer confidence is lumped together with available hard data, there is no indication that a more sophisticated construction method and/or the use of a wider set of survey questions would produce consumer confidence indicators with a better ability to forecast turning points in private consumption.

Table 2.1: AUROCs and differences between models' AUROCs

out-of-sample AUROCS		pair-wise differences between AUROCs		
			t-stat.	p-value
CCI	0.72			
PCA	0.74	CCI/PCA	0.421	0.337
PLS	0.76	CCI/PLS	0.777	0.219
RR	0.76	CCI/RR	0.672	0.251

Results: evidence from sub-sets of questions from the consumer survey

In a next step, we examine whether the picture changes when using confidence indicators which are constructed from sub-sets of the consumer survey questions, rather than all of them. The motivation for our approach is that the survey questions can be categorised along two main criteria which potentially help filtering out questions carrying forecast-relevant information which goes beyond that included in available macro-economic series.

The first criterion is the time period to which the survey questions refer. Questions inquiring *consumers' expectations* (for the next 12 months) arguably measure a dimension which is, if at all, only partially reflected in the available macro-economic series used in our model. At the same time, the expectation questions can be assumed to be particularly beneficial for the purpose of forecasting. The assumption is thus that the inclusion of confidence indicators extracted only from forward-looking questions will yield models performing better than models using questions about the current situation and past developments.

A second important fault line between the survey questions is whether they inquire *household-specific (micro)* questions, such as households' financial situation, their expenditure/savings plans, etc., or questions about general economic conditions (unemployment levels, etc.). While we do not have strong a priori assumptions as to which of the two question types will produce more forecast-relevant confidence indicators, the indicators derived from micro-questions could arguably be more complementary to the hard data predictors contained in the models than indicators derived from macro survey questions. After all, the micro dimension can be assumed to be largely absent from the hard data.

Tables 2.2 to 2.5 summarise the results. Against our expectations, there does not seem to be any difference between current/backward- and forward-looking questions regarding their forecasting power when combined with hard data in a model: In both cases, their AUROCs remain clearly above 0.7, but below 0.8 (see left panels of Tables 2.2 and 2.3). Little surprising, there is no statistically significant difference between the model based on the CCI and that based on the new indicators, no matter whether using current/backward- or forward-looking input questions (see the p-values in the right panel of Tables 2.2 and 2.3).

Table 2.2: current/backward-looking survey questions

out-of-sample AUROCS		pair-wise differences between AUROCs		
			t-stat.	p-value
CCI	0.72			
PCA	0.75	CCI/PCA	0.517	0.303
PLS	0.79	CCI/PLS	1.065	0.143
RR	0.78	CCI/RR	0.849	0.198

Table 2.3: forward-looking survey questions

out-of-sample AUROCS		pair-wise differences between AUROCs		
			t-stat.	p-value
CCI	0.72			
PCA	0.73	CCI/PCA	0.215	0.415
PLS	0.73	CCI/PLS	0.137	0.445
RR	0.74	CCI/RR	0.444	0.328

Table 2.4: general economy survey questions

out-of-sample AUROCS		pair-wise differences between AUROCs		
			t-stat.	p-value
CCI	0.72			
PCA	0.73	CCI/PCA	0.264	0.396
PLS	0.75	CCI/PLS	0.480	0.316
RR	0.75	CCI/RR	0.586	0.279

Table 2.5: household-specific survey questions

out-of-sample AUROCS		pair-wise differences between AUROCs		
			t-stat.	p-value
CCI	0.72			
PCA	0.80	CCI/PCA	1.479	0.070
PLS	0.81	CCI/PLS	1.490	0.068
RR	0.81	CCI/RR	1.491	0.067

Turning to the difference between survey questions inquiring general economic versus household-specific concepts, the picture changes. Firstly, models resorting to the indicators based on *household-specific (micro) questions* achieve AUROCs which are substantially higher than those produced if confidence indicators based on questions about the *general economic situation (macro questions)* are included in the forecasting equation (compare left panels of Tables 2.4 and 2.5). The approach relying on micro questions produces AUROCs equal to, or slightly above, 0.80. These AUROCs also compare favourably to the model relying solely on the CCI and hard-data (0.72). In line with these findings, the analysis of the differences between the different micro-question models and the one based on the CCI (see right panel of Table 2.5) testifies to the superiority of the former type of models, with p-values indicating statistical significance at the 10% level. The finding holds true, irrespective of whether the micro questions have been aggregated by PCA, PLS or RR methods. By the same token, the models based on confidence indicators derived from macro-questions are found to not to be statistically more powerful than the CCI – model (see right panel of Table 2.4).

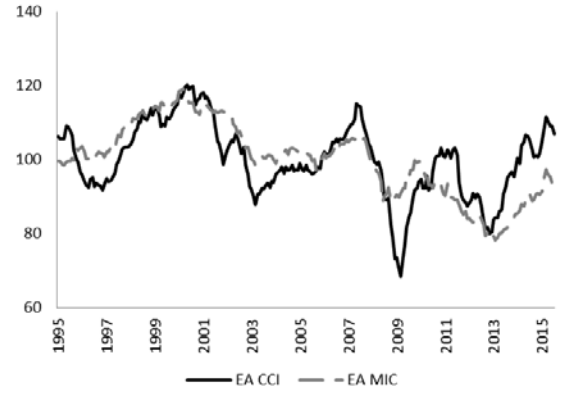
In a nutshell, our findings thus suggest that micro questions carry information which, in combination with available hard data, is more useful than the CCI for forecasting turning points in private consumption growth. Keeping in mind that the hard data included in our model are rather general, in the sense that they capture economic conditions relevant to all types of economic actors, not to private households in particular, it appears plausible that a confidence indicator capturing solely household-specific conditions provides a particular value added.

To get a better understanding of the consumer indicator based on household-specific questions, we plot it alongside the current established CCI (see graph 2.1).[9] Up to the financial crisis of 2008/09, both indicators seem to go broadly in lockstep. Subsequently, they clearly diverge from each other: While the CCI reaches its lowest ever level at the peak of the financial crisis, in 2009, the new indicator shows a far more profound drop in the economic downturn of 2013. The observed pattern appears convincing when recalling the economic policies of the last years: 2009 saw significant increases in government spending in order to fend off the negative consequences of the crisis. As evidenced by the EA

[9] The alternative indicator EA Mic is based on ridge regression (RR). Both indicators have been rescaled to render them comparable.

unemployment rate peaking and consumer spending reaching its low-point in 2013, private households have arguably not been as much affected by the 2009 crisis as they were a few years later, at the peak of the sovereign debt crisis, which forced states to rein in their spending and implement significant tax hikes. Since the alternative confidence indicator relies solely on household-specific questions, it is logical that it is more sensitive to changes in households' revenue position than in more general, macroeconomic conditions.

Graph 2.1: EA consumer confidence indicator (CCI) and indicator derived from household-specific survey questions (MIC)



Conclusions

The present special topic complements the analytical steps documented in last quarter's EBCI, which aim to establish whether new ways of aggregating the results of the harmonised EU consumer survey can produce 'better' confidence indicators than DG ECFIN's established CCI. Focussing on the performance of the CCI and a number of promising alternative indicators in realistic forecasting scenarios (i.e. scenarios where the confidence indicators are used alongside available hard data), the evidence in this special topic suggests that none of them carries forecast-relevant information going beyond that included in the CCI. However, when re-constructing the new indicators solely on the basis of household-specific (micro) questions, such as households' financial situation, their savings plans, etc., the new indicators are shown to carry forecast-relevant information which is complementary to that in the hard data, and going beyond that contained in the CCI.

In interpreting our results it has to be borne in mind that they apply to the specific case of forecasting *turning points* in private consumption growth, using a *combination of survey and hard statistical data*. The finding that a particular data or indicator category produces worse results in this scenario than another does not rule out that it might show a better tracking performance of recent developments in consumption growth when used as a simple indicator as such. Moreover, the jury on the performance of the diverse indicators in producing *quantitative point estimates* (rather than qualitative turning point indications) is left for further research.

ANNEX

Reference series

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

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. EU and euro-area aggregates are calculated on the basis of the national results and seasonally adjusted. The ESI is scaled to a long-term mean of 100 and a standard deviation of 10. Thus, values above 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 (ESI and confidence indices) 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, based on principal component analyses of balance series (s.a.) from five surveys. The input series are as follows: industry: five of the monthly survey questions (employment and selling-price expectations are excluded); 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 sector climate indicators. The sector weights are equal to those underlying the Economic Sentiment Indicator (ESI, see above).
In the second stage, 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 normalised (zero mean and unit standard deviation). 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 and 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. 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.

EUROPEAN ECONOMY TECHNICAL PAPERS

European Economy Technical Papers can be accessed and downloaded free of charge from the following address:
http://ec.europa.eu/economy_finance/publications/eetp/index_en.htm

Titles published before July 2015 can be accessed and downloaded free of charge from:
http://ec.europa.eu/economy_finance/publications/cycle_indicators/index_en.htm
(European Business Cycle Indicators).

Alternatively, hard copies may be ordered via the "Print-on-demand" service offered by the EU Bookshop: http://bookshop.europa.eu.

HOW TO OBTAIN EU PUBLICATIONS

Free publications:

- one copy:
  via EU Bookshop (http://bookshop.europa.eu);

- more than one copy or posters/maps:
  from the European Union's representations (http://ec.europa.eu/represent_en.htm);
  from the delegations in non-EU countries (http://eeas.europa.eu/delegations/index_en.htm);
  by contacting the Europe Direct service (http://europa.eu/europedirect/index_en.htm) or
  calling 00 800 6 7 8 9 10 11 (freephone number from anywhere in the EU) (*).

  (*) The information given is free, as are most calls (though some operators, phone boxes or hotels may charge you).

Priced publications:

- via EU Bookshop (http://bookshop.europa.eu).

KC-BF-16-005-EN-N

Publications Office