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European Business Cycle Indicators

4th Quarter 2019

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European Commission
Directorate-General for Economic and Financial Affairs

European Business Cycle Indicators

4th Quarter 2019

Special topic

- A new employment index for the euro area based on sectoral employment expectations

This document is written by the staff of the Directorate-General for Economic and Financial Affairs, Directorate A for Policy, Strategy, Coordination and Communication, Unit A3 - Economic Situation, Forecasts, Business and Consumer Surveys (http://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/business-and-consumer-surveys_en).

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- The Economic Sentiment Indicators (ESI) for the euro area (EA) and the EU stabilised over the fourth quarter (-0.2 (EA) / ±0.0 (EU) points compared to September), putting a tentative halt to the persistent downward trend they had followed since early 2018. The EA indicator finished the year slightly above (101.5 points), and the EU indicator precisely at the long-term average of 100.

- Confidence levels in EA/EU industry and retail trade stayed broadly unchanged. Construction and services managers posted some improvements in sentiment. Consumer mood softened, more noticeably so in the EA.

- Focussing on the seven largest EU economies, sentiment in 2019-Q4 worsened in Poland (-2.4), the Netherlands (-1.2) and Spain (-1.0), while it changed little over the quarter in the UK (-0.1), France (-0.5) and Germany (+0.6). Italy stood out with a 1.7-points improvement.

- Capacity utilisation in manufacturing decreased in both the EA and the EU by, respectively, 0.7 and 0.5 percentage points (pp) compared to the last survey wave of July. Currently, capacity utilisation is at 81.2% (EA) and 81.1% (EU), i.e. only marginally above the two regions' respective long-term averages of around 81%. In services, capacity utilisation decreased slightly by around ¼ pp. in both regions. At 90.2%, EA capacity utilisation remained above its long-term average of just below 89%. The EU rate of 89.1% is just an inch above its historic mean of 88.8%.

Results of the autumn 2019 EU Investment Survey in the manufacturing sector

The latest EU-wide Investment Survey was conducted in October-November 2019. The results indicate that euro-area and EU real manufacturing investment has declined in 2019 (by 2.0% and 1.7%, respectively) and is foreseen to rebound moderately in 2020 (at rates of 1.3% and 0.7%, respectively). At country level, manufacturing managers assessed their investment in 2019 to have increased in Germany, France, the Netherlands, Poland and the UK, while managers in Spain and Italy estimated a decline. For 2020, managers in Germany and the UK plan to further increase their investment. Investments are expected to decrease in France, the Netherlands and in Poland, and also managers in Spain and Italy foresee a further decline. The Investment Survey also provides information on the factors influencing investment (demand, financial resources, technical, other) and asks firms to assign their investments to four objectives (replacement, extension, rationalisation, other). Interestingly, other investment objectives (pollution control, safety, etc.) appear to have gained importance over recent years. Results for the EU, euro area and large Member States, broken down by main industrial groupings and size classes are reported.

Special topic: A new employment index for the euro area based on sectoral employment expectations

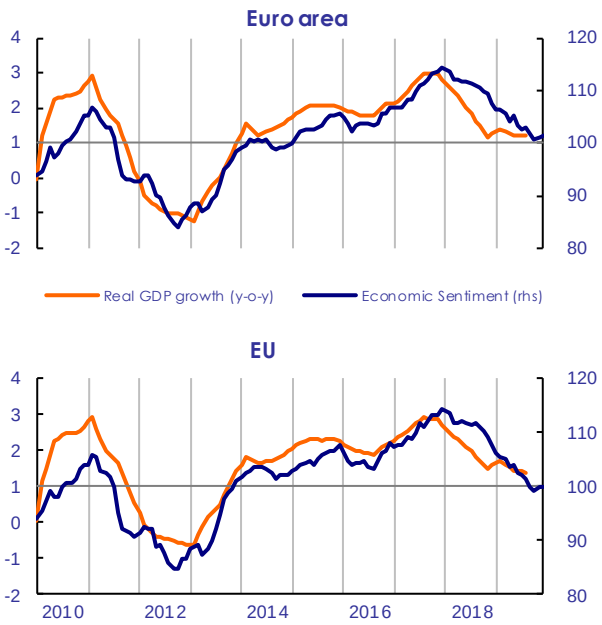
This special topic presents an analytical framework to construct a new employment index for the euro area, designed to complement the information about output-related developments provided by the Economic Sentiment Indicator (ESI). Four different indexes are constructed using data on sectoral employment expectations collected by the Harmonised EU Programme of Business and Consumer Surveys. All four composite indexes are highly correlated with total employment growth, irrespective of the weighting system used for the construction, and perform well in terms of directional accuracy. From a conceptual point of view, the index based on sectoral employment shares appears preferable. While expectations collected in the first month of the quarter show some lagging properties, these are reduced or disappear when the expectations collected in the last month of the quarter are examined. Considering the significant publication delay of statistical information on employment growth, the presented indicators do contain valuable information on employment trends during the quarter. The study also presents a simple nowcasting exercise, showing that the BCS-based employment indexes improve the accuracy of predictions of employment growth. The creation of the new survey-based employment index is in line with, and may help support and strengthen, the economic narrative of the new European Commission, which stresses social fairness, inclusive growth and prosperity.

1. RECENT DEVELOPMENTS IN SURVEY INDICATORS

1.1. EU and euro area

The Economic Sentiment Indicators (ESI) for the euro area (EA) and the EU stabilised over the fourth quarter (-0.2 (EA) / ±0.0 (EU) points compared to September), putting a tentative halt to the persistent downward trend they had followed since early 2018. The EA indicator finished the year slightly above (101.5 points), and the EU indicator precisely at the long-term average of 100.

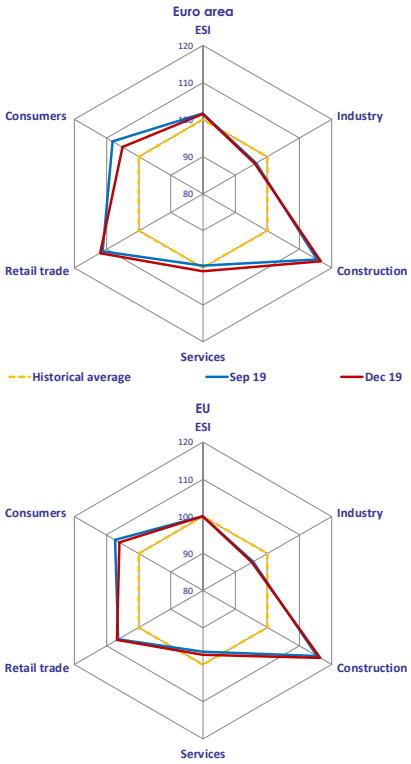
Graph 1.1.1: Economic Sentiment Indicator



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.

Developments in the ESI were broadly in line with those in IHS Markit's PMI Composite Output Index and the Ifo Business Climate Index (for Germany), both of which showed signs of stabilisation in 2019-Q4 after the broad downward trend followed since the beginning of 2018.

Graph 1.1.2: Radar Charts



Note: A development away from the centre reflects an improvement of a given indicator. The ESI is computed with the following sector weights: industry 40%, services 30%, consumers 20%, construction 5%, retail trade 5%. Series are normalised to a mean of 100 and a standard deviation of 10. Historical averages are generally calculated from 1990q1. For more information on the radar charts see the Special Topic in the 2016q1 EBCI.

From a sectoral perspective (see Graph 1.1.2), confidence levels in EA/EU industry and retail trade stayed broadly unchanged. Construction and services managers posted some improvements in sentiment, which were a bit more pronounced in EA services. Consumer mood softened, more noticeably so in the EA.

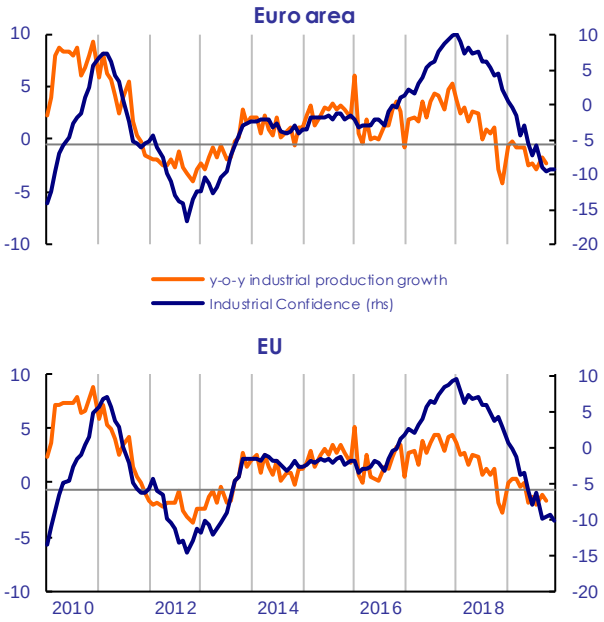
In terms of levels, EA and EU confidence indicators in retail trade, construction and among consumers remain well above their respective long-term averages, while the industry index continues scoring low by historic standards. The latter also holds true for services in the EU, while the EA indicator surpassed its long-term average in 2019-Q4.

Focussing on the seven largest EU economies, sentiment in 2019-Q4 worsened in Poland (-2.4), the Netherlands (-1.2) and Spain (-1.0), while it changed little over the quarter in the UK (-0.1), France (-0.5) and Germany (+0.6). Italy stood out with a 1.7-points improvement.

Sector developments

Industry confidence moved broadly sideways in both the EA (-0.4) and the EU (-0.2), putting a tentative halt to the indicators' steady decline since 2018. Both indices stabilised below their respective long-term averages, as illustrated in Graph 1.1.3. Reflecting the flat evolution of industry confidence, the climate tracer for the sector remained in the contraction quadrant in both the EA and the EU (see Graph 1.1.14).

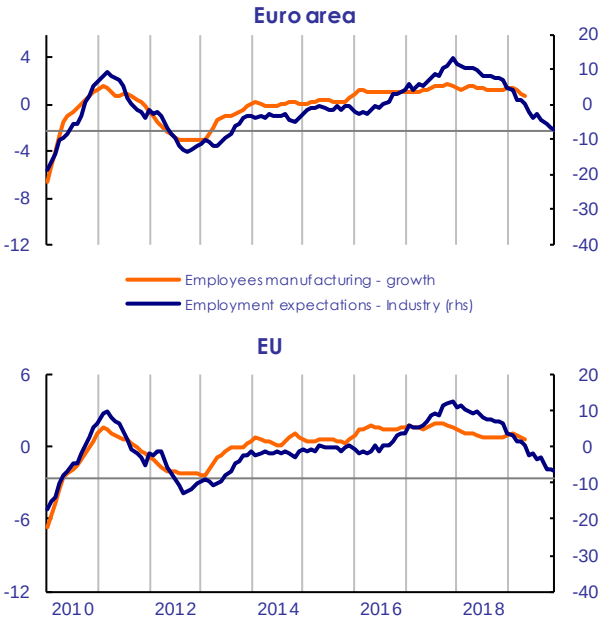
Graph 1.1.3: Industry Confidence indicator



The largely unchanged level of industry confidence reflects managers' more tepid assessments of their order books and the stock of finished products, which were counterbalanced by improved production expectations, especially in the EU.
Of the components not included in the confidence indicator, both managers' views on past production and export order books deteriorated, whereby that tendency was more pronounced in the EU.

Echoing the stabilisation of overall confidence in the sector, EA and EU managers' selling price expectations bottomed out after three quarters of strongly declining readings. **Industry managers' employment expectations**, by contrast, showed no signs of a consolidation, posting the eighth consecutive quarterly decline (see Graph 1.1.4).

Graph 1.1.4: Employment expectations- Industry

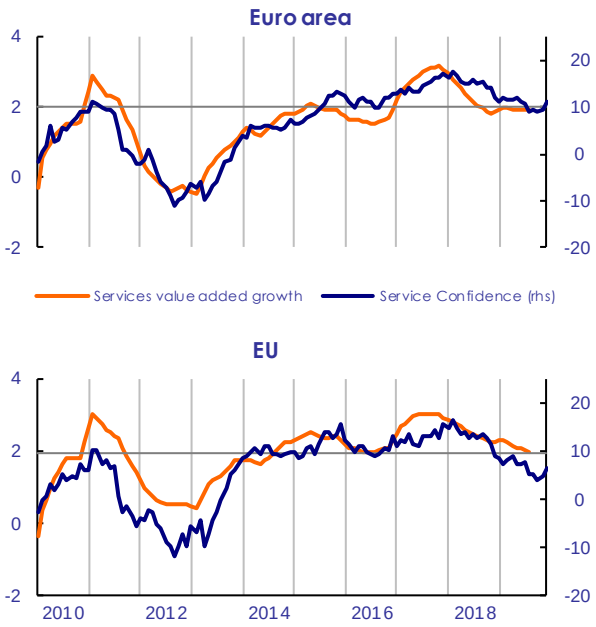


Among the seven largest EU Member States, industry confidence weakened in the Netherlands (-1.3) and Germany (-0.9), while it strengthened in France (+0.8), the UK (+1.5) and Spain (+2.0). Sentiment in Italy (+0.3) and Poland (-0.3) remained virtually unchanged.

According to the quarterly manufacturing survey (carried out in October), **capacity utilisation in manufacturing** decreased in both the EA and the EU by, respectively, 0.7 and 0.5 percentage points (pp) compared to the last survey wave of July. Currently, capacity utilisation is at 81.2% (EA) and 81.1% (EU), i.e. only marginally above the two regions' respective long-term averages of around 81%.

Services confidence finished 2019 on a positive note, rebounding from a significant drop in Q3. Gaining 1.9 points on the quarter, the EA indicator is again above its long-term average which it had fallen short of since August. EU confidence posted a 1.2-point increase, which, however, failed to lift the index above its historic average (see Graph 1.1.5).

Graph 1.1.5: Services Confidence indicator



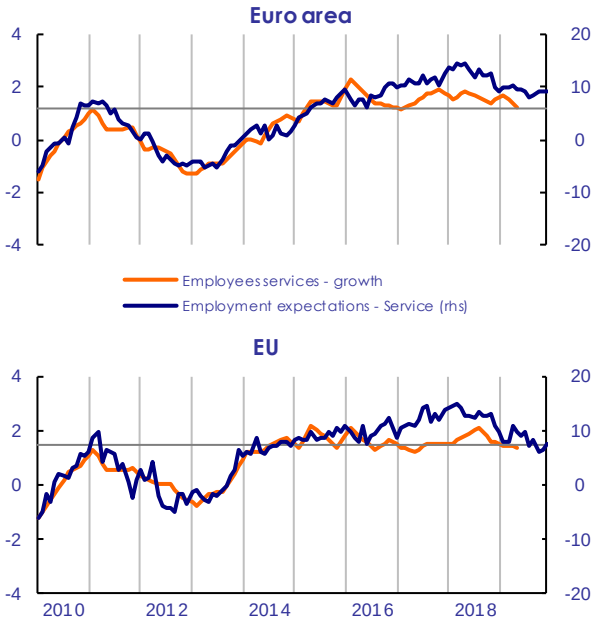
The rise in EA services confidence was driven by managers' more favourable views on past and expected demand, as well as, to a lesser extent, better appraisals of the past business situation. In the EU, by contrast, better sentiment reflected the largest quarterly improvement in demand expectations since 2011, which were only partially offset by grimmer views on past demand and the past business situation

Employment expectations in services edged up in the EA after 1 ½ years of deteriorating or flat quarterly readings, while expectations in the EU continued clouding over (see Graph 1.1.6). In line with brighter demand expectations, selling price expectations rose, albeit only by a moderate margin. The latest figures thus hint at a continuation of the broad upward trend observed in official data on EA services inflation (year-on-year) since August.

Focussing on the seven largest EU economies, services confidence firmed in Germany (+4.5), Italy (+4.2) and France (+1.2), while it decreased in Spain (-3.1), the Netherlands (-2.3) and Poland (-1.6). Developments in the UK were broadly flat (+0.1).

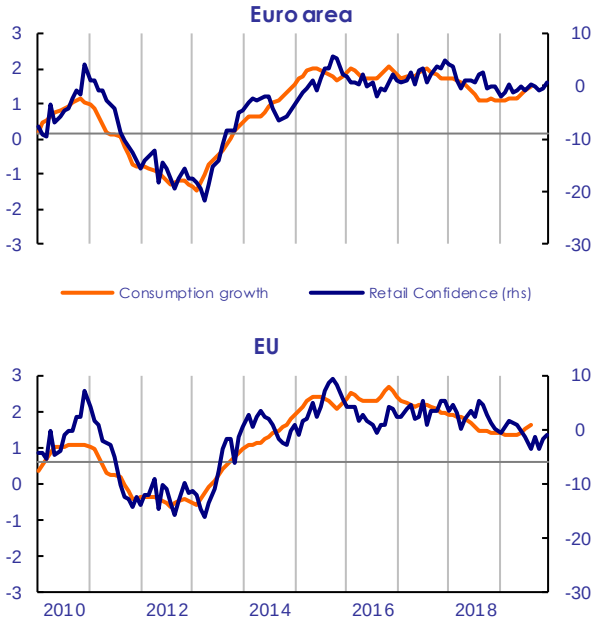
Capacity utilisation in services, as measured by the quarterly survey in October, decreased slightly in both the EA and EU, by 0.3pp and 0.2pp respectively, compared to the last survey wave of July. At 90.2%, EA capacity utilisation remained above its long-term average of just below 89% (calculated from 2011 onwards). The EU rate of 89.1% is just an inch above its historic mean of 88.8%.

Graph 1.1.6: Employment expectations- Services



The **retail trade** confidence indicator moved broadly sideways in the EA (+0.6), as well as the EU (+0.3). Both indicators sit comfortably above their respective long-term averages (see Graph 1.1.7).

Graph 1.1.7: Retail Trade Confidence indicator



In the EA, the broadly unchanged picture compared to the end of 2019-Q3 resulted from

managers' more favourable appraisals of the past business situation being diluted by virtually unchanged views on the level of stocks and the future business situation. In the EU, managers were much more upbeat in respect of the future business situation, but, at the same time, they reported a higher level of stocks in relation to expected sales. The latter is mainly due to a surge in stocks in October, which likely reflected some stockpiling of retails amid growing concerns about a possible 'hard' Brexit at that time. Finally, managers' views on the past business situation remained much the same compared to the preceding quarter.

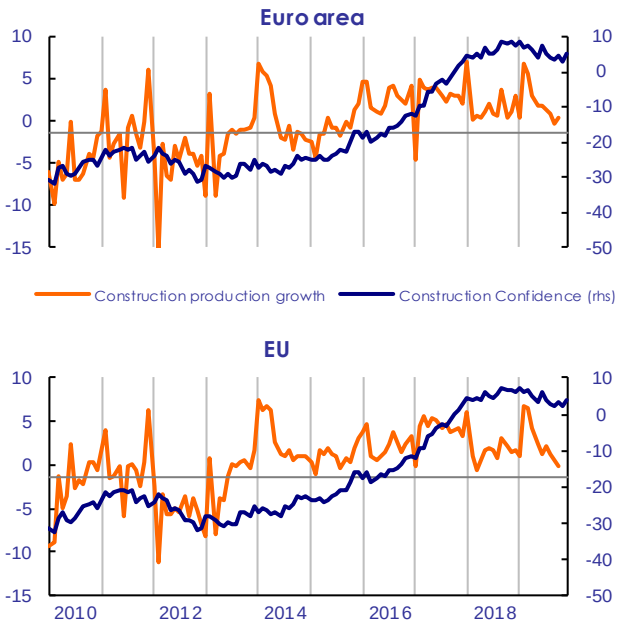
Zooming in on seven largest EU economies, confidence firmed in Germany (+2.7), Italy (+1.7) and France (+1.4), while it got weaker in the Netherlands (-3.1) and the UK (-1.6) and stayed broadly flat in Spain (-0.2) and Poland (+0.4).

Construction confidence showed some signs of a recovery from its softening in 2019-Q3, gaining 1.6 (EA) / 1.2 (EU) points on the quarter. In spite of the indicators' muted downward trend since 2018-Q4, both prevail at historically high levels, when compared to their long-term averages (see Graph 1.1.8).

At component level, both areas saw managers' **employment expectations** improve. The assessment of order books, by contrast, improved only in the EA, while it remained virtually unchanged in the EU.

Among the six[1] largest EU economies, construction confidence increased in France (+4.9), Germany (+2.5) and Italy (+2.3), while it faded in the Netherlands (-6.9) and Spain (-3.6). Sentiment in Poland remained broadly stable (+0.4).

Graph 1.1.8: Construction Confidence indicator



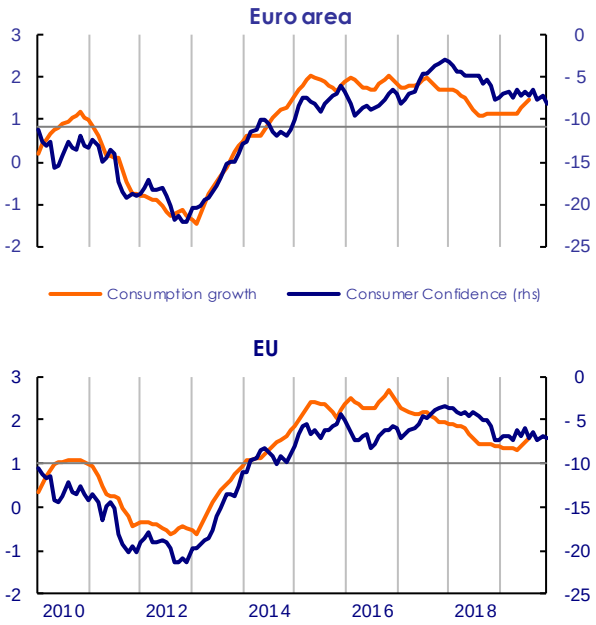
Consumer confidence eased in the EA (-1.6) and, marginally so, in the EU (-0.6). From a longer-term perspective though, the recent changes do not visibly alter the stable level that the indicator has maintained since the beginning of 2019, following the correction witnessed during 2018. Accordingly, consumer confidence remains comfortably above its long-term average in both regions (see Graph 1.1.9).

Looking at the individual components of the indicator, EA/EU consumers' assessments of their personal financial situation (both past and future) deteriorated. Their intentions to make major purchases, however, remained broadly stable. As regards the future general economic situation, consumers in the EA became increasingly concerned throughout 2019-Q4, while results in the wider EU hint at stable expectations.

Consumer sentiment clouded over in Spain (-5.9), France (-3.2), Poland (-2.9) and Germany (-1.3), as opposed to developments in the UK (+2.7) and the Netherlands (+1.2). The level of confidence in Italy remained practically unchanged (-0.4).

[1] No results can be reported for the UK, where the construction survey was stopped in November 2019.

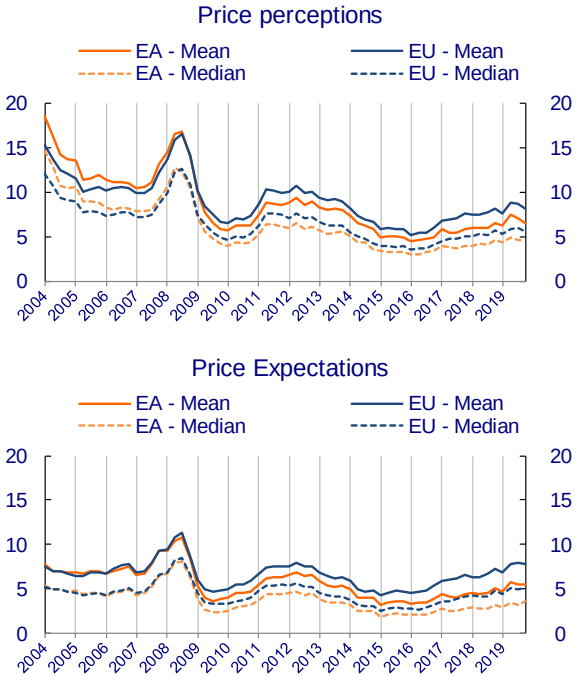
Graph 1.1.9: Consumer Confidence indicator



In both the EA and the EU, the mean of consumers' quantitative price perceptions decreased in 2019-Q4 compared to 2019-Q3. Also the two region's median price perceptions eased, but to a lesser extent, especially in the EA. The mean of consumers' price expectations over the next 12 months remained unchanged in the EA, while it saw a slight decrease in the EU. Consumers' median expectations, by contrast, increased in the EA and, marginally so, in the EU (see Graph 1.1.10).[2]

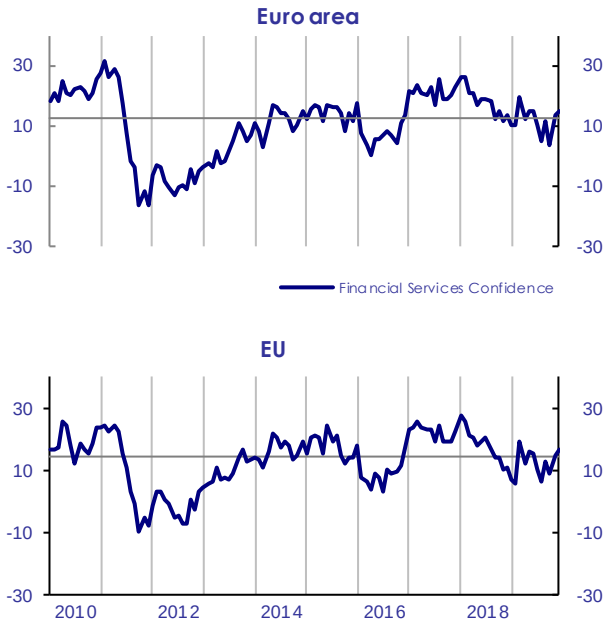
The same image appears when looking at the socio-economic breakdown categories (i.e. gender, age, income, educational level). In virtually all of the categories the mean and the median decreased in the case of price perceptions. For consumers' price expectations, there is no common tendency across the different categories in terms of EA mean and EU median expectations. By contrast, mean expectations in the EU decreased across the board, the opposite holding true for EA median expectations (see tables A.1.1 and A.1.2 in the Annex to section 1).

Graph 1.1.10: Euro area and EU quantitative consumer price perceptions and expectations



The **financial services** confidence indicator (not included in the ESI) gained 3.6 (EA) / 4.1 (EU) points on the quarter. In both regions, the increases of 2019-Q4 lifted the indicator slightly above its long-term average (see Graph 1.1.11).

Graph 1.1.11: Financial Services Confidence indicator



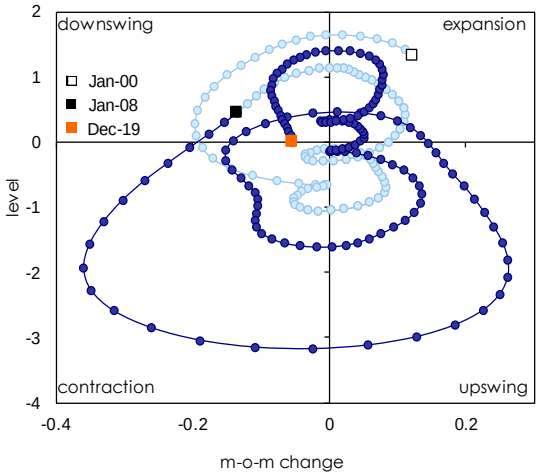
EA and EU financial managers were more upbeat in respect of past demand and the past

[2] For more information on the quantitative inflation perceptions and expectations, see the special topic in the previous EBCI 2019Q1.

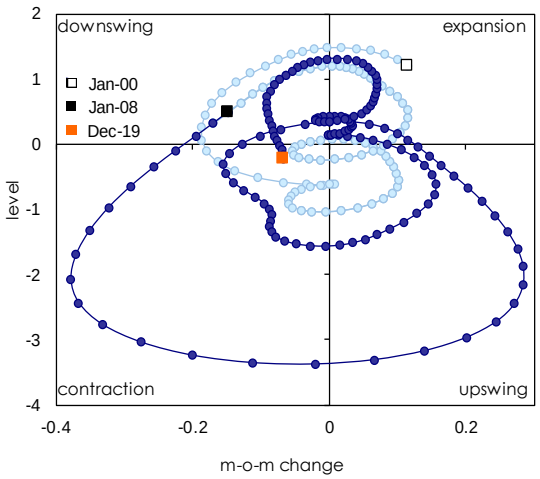
business situation, while less optimistic as regards the evolution of future demand.

Reflecting the flat development of overall economic sentiment in 2019-Q4, the EA and EU **climate tracers** (see Annex for details) remained virtually unchanged compared to the end of 2019-Q3. Both tracers are currently in the border region between the downswing and the contraction quadrant (see Graphs 1.1.12 and 1.1.13).

Graph 1.1.12: Euro area Climate Tracer

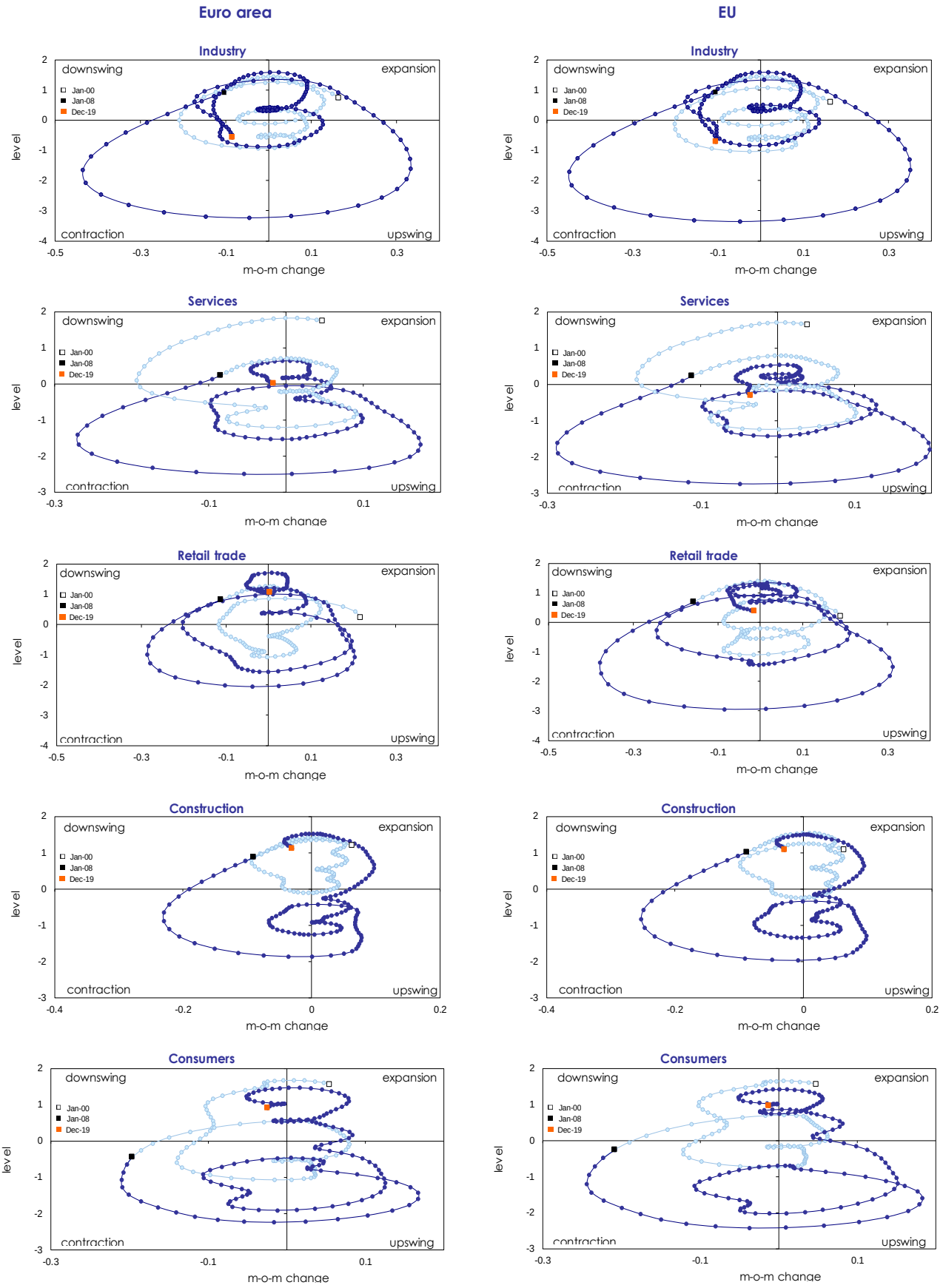


Graph 1.1.13: EU Climate Tracer



The sectoral EA/EU climate tracers (see Graph 1.1.14) changed in most cases only marginally between the end of 2019-Q3 and Q4. The only developments worth mentioning relate to the consumer climate tracers, which moved in both the EA and the EU from the border between expansion and downswing more firmly into the downswing quadrant.

Graph 1.1.14: Economic climate tracers across sectors

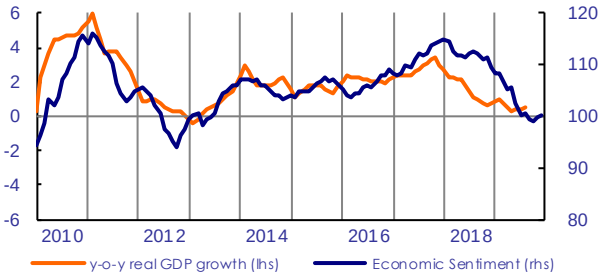


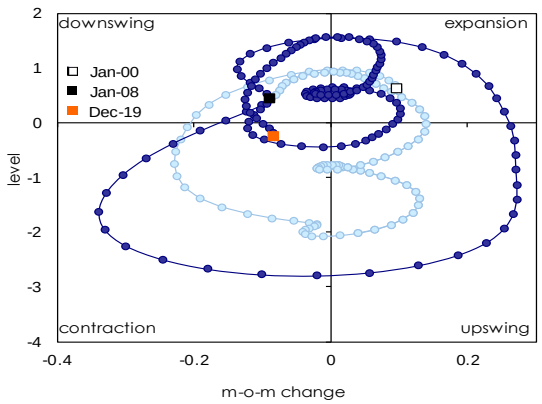
1.2. Selected Member States

Focussing on the seven largest EU economies, 2019-Q4 sentiment worsened in Poland (-2.4), the Netherlands (-1.2) and Spain (-1.0), while it changed little over the quarter in the UK (-0.1), France (-0.5) and Germany (+0.6). Italy stood out with a 1.7-points improvement.

In **Germany**, the ESI edged up in 2019-Q4 (+0.6), hinting at a bottoming-out after four consecutive quarters of hefty declines, which had temporarily brought the indicator below its long-term average. At 100, the current ESI-reading corresponds precisely to its historic average. The German climate tracer (see Graph 1.2.1) showed little movement, continuing to locate the economy in the upmost layer of the contraction quadrant.

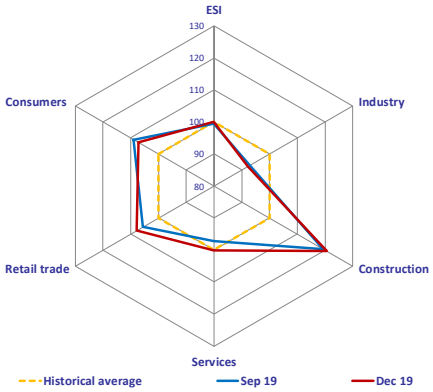
Graph 1.2.1: Economic Sentiment Indicator and Climate Tracer for Germany





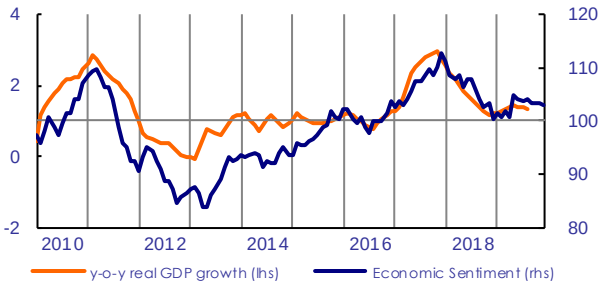
From a sectoral perspective, services confidence rebounded from its sharp losses in 2019-Q3. Further positive signals came from the retail trade and construction sectors. Consumer morale, by contrast, eased, as did confidence among industry managers. In respect of the latter, it is worth highlighting that the decrease over 2019-Q4 was very moderate compared to the preceding five quarters, providing some hope of a stabilisation of the sector. Compared to historic standards, confidence levels are currently high among consumers, as well as in retail trade and, particularly, construction. Sentiment in services is at usual levels, while industry managers are exceptionally pessimistic (see Graph 1.2.2).

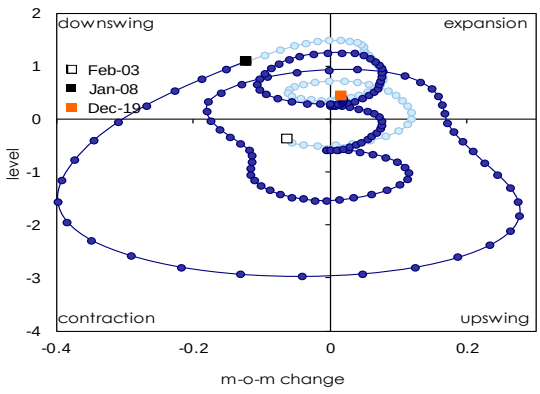
Graph 1.2.2: Radar Chart for Germany



In **France** the ESI continued the marginally downward-sloping sideways movement of 2019-Q3 (-0.5). At 103.0 points, the indicator still exceeds its historical average.

Graph 1.2.3: Economic Sentiment Indicator and Climate Tracer for France



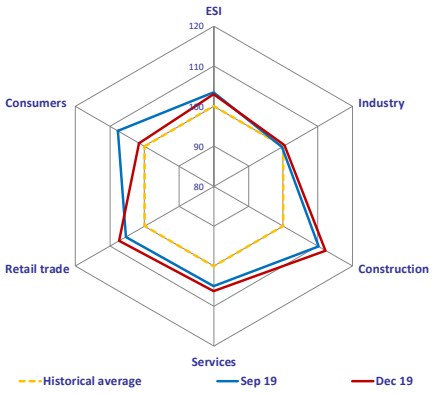


In line with the quiescent sentiment data, the French climate tracer remained virtually

unchanged in the expansion quadrant (see Graph 1.2.3).

A look at the French radar chart (see Graph 1.2.4) shows the relative stability of the ESI to reflect a combination of improving sentiment in all surveyed business sectors and a slump in consumer morale. The latter posed an abrupt end to the ballooning of consumer confidence throughout the first three quarters of 2019. Confidence levels continued to largely exceed long-term averages in construction, services and retail trade, while they were at usual levels in industry and among consumers.

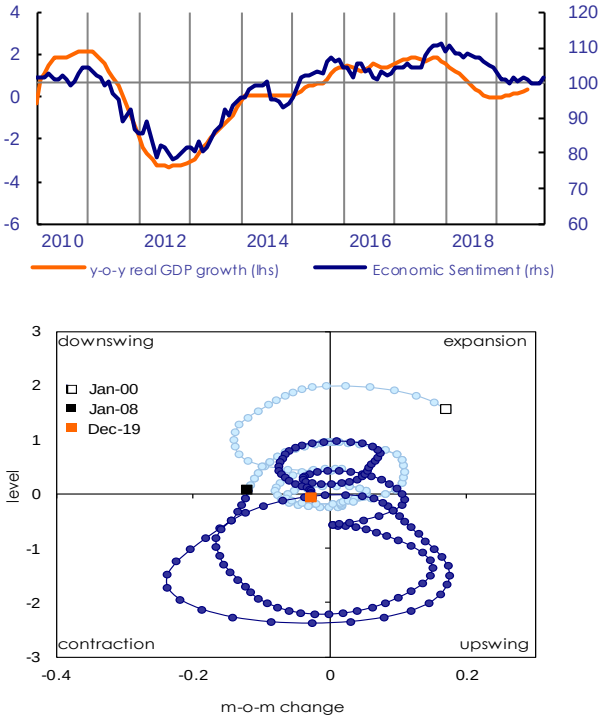
Graph 1.2.4: Radar Chart for France



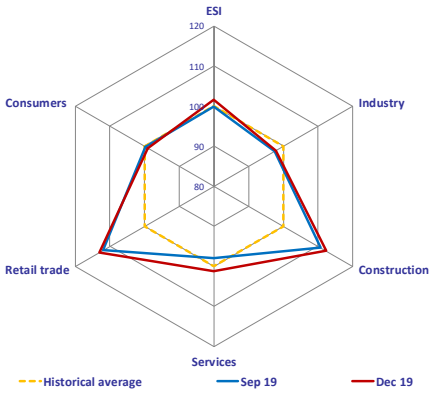
Following two quarters with broadly flat readings, sentiment in **Italy** improved in 2019-Q4 (+1.7). The current reading of the ESI (101.6) is slightly above its long-term average of 100. The country's climate tracer remained broadly unchanged, locating the economy at the intersection of the downswing and contraction quadrant (see Graph 1.2.5).

A look at the Italian radar chart (see Graph 1.2.6) shows that sentiment among industry managers and consumers remained flat and improvements were concentrated on the retail trade, construction and, particularly, services sectors. The surge in services confidence is worth highlighting because it broke the indicator's steady decline since mid-2018. Compared to historical averages, the current level of confidence is particularly high in retail trade and construction and, to a much lesser extent in services. Consumer confidence, by contrast, is at usual levels and industry confidence rather low.

Graph 1.2.5: Economic Sentiment Indicator and Climate Tracer for Italy



Graph 1.2.6: Radar Chart for Italy

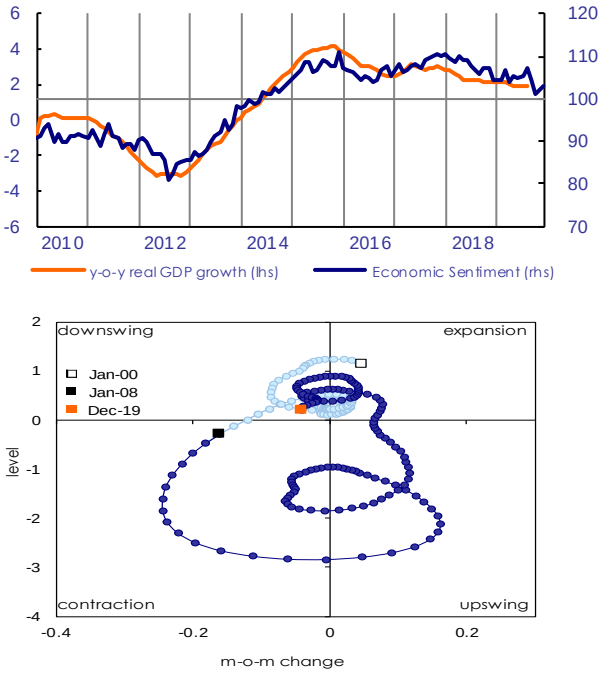


Sentiment in **Spain** saw some deterioration in 2019-Q4 (-1.0), which, however, left the indicator (currently at 103.2) above its long-term average of 100. The climate tracer changed only little and continued signalling a downswing of the economy (see Graph 1.2.7).

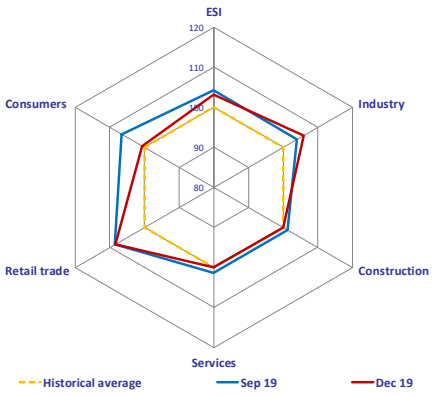
As shown in the radar chart (see Graph 1.2.8), only industry managers reported brighter sentiment, while the rest of the economy saw confidence fade (construction, services, consumers) or remain stable (retail trade). Consumers were particularly downbeat, posting the second, hefty quarterly decline in a row, which brought the confidence indicator back to

the long-term average it had been well in excess of during the last five years. Also services and construction confidence finished the year at historically normal levels, whereas industry and retail trade confidence was exceptionally high.

Graph 1.2.7: Economic Sentiment Indicator and Climate Tracer for Spain

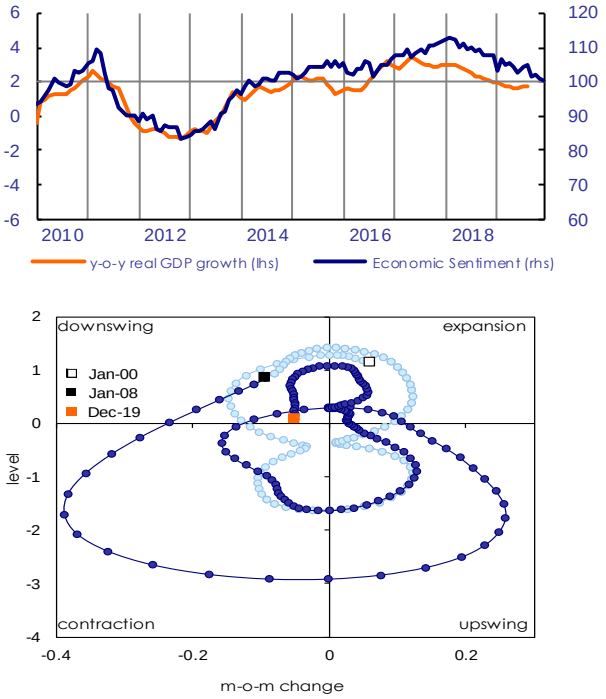


Graph 1.2.8: Radar Chart for Spain



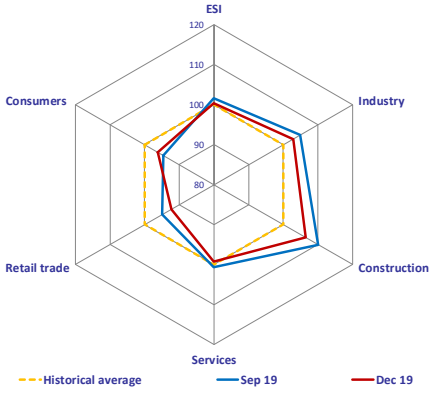
Dutch sentiment continued the downward trend embarked upon at the beginning of 2018, shedding 1.2 points on the quarter. At 100.4 points, the ESI is now only a whisker away from its long-term average of 100, which it had comfortably exceeded since the beginning of 2015. The latest decline pushed the Dutch climate tracer deeper into the downswing quadrant, i.e. closer to the intersection with the contraction area (see Graph 1.2.9).

Graph 1.2.9: Economic Sentiment Indicator and Climate Tracer for the Netherlands



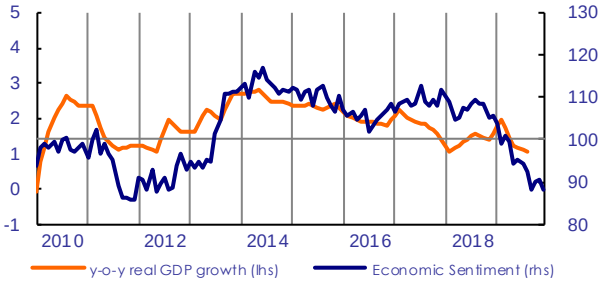
Sentiment deteriorated in all surveyed business sectors and, most so, in construction and retail trade. Bucking the trend, confidence among consumer firmed. Compared to long-term averages, only confidence among industry and construction managers remains high, while it is particularly low among retail trade executives and consumers and at usual levels in services (see Graph 1.2.10).

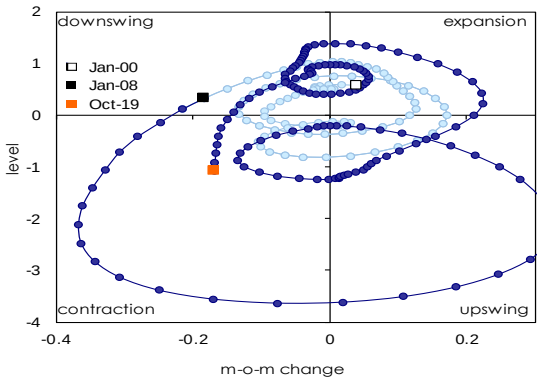
Graph 1.2.10: Radar Chart for the Netherlands



After four quarters of sharply deteriorating sentiment in the **United Kingdom**, 2019-Q4 brought some respite, as the ESI moved broadly sideways (-0.1). At 87.9 points, the indicator remains extremely low by historical standards (long-term average of 100)[3].

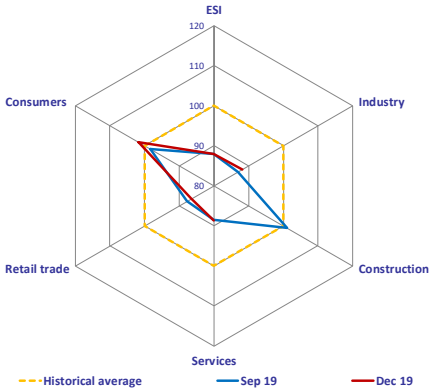
Graph 1.2.11: Economic Sentiment Indicator and Climate Tracer for the United Kingdom





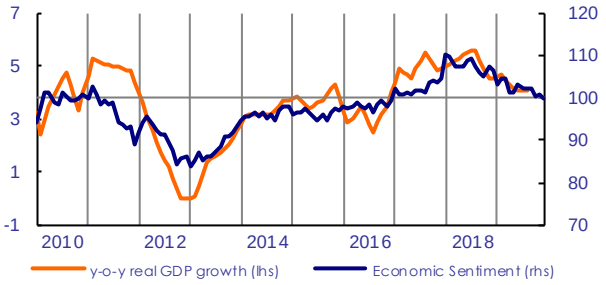
Focussing on sectoral developments (see Graph 1.2.12), confidence strengthened among consumers and industry managers, while it faded further among retail trade executives. Sentiment in the services sector remained flat. In line with the ESI, all confidence indicators are extremely low compared to their respective long-term averages, the only exception being consumer confidence.

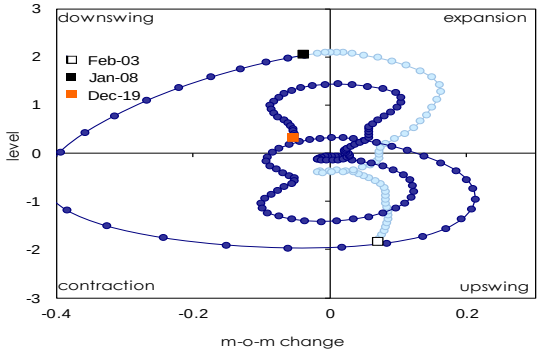
Graph 1.2.12: Radar Chart for the UK



Sentiment in **Poland** continued the broad downward trend prevalent since the beginning of 2018 (-2.4). At 99.7 points, the ESI fell slightly below its long-term average of 100, which it had last time undercut in 2016. Slipping confidence sent the Polish climate tracer deeper into the downswing quadrant, i.e. closer to the area signalling contraction (see Graph 1.2.13).

Graph 1.2.13: Economic Sentiment Indicator and Climate Tracer for Poland

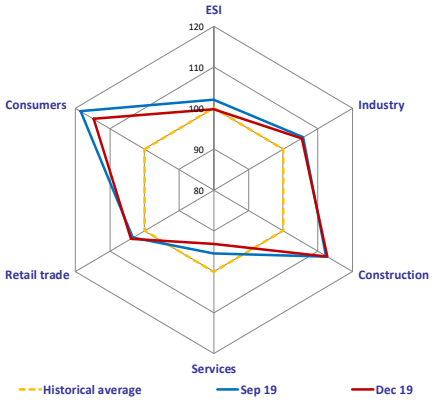




As the Polish radar chart shows (see Graph 1.2.14), confidence was broadly flat in industry, construction and retail trade, while it weakened significantly in services and among consumers.

[3] Contrary to the other countries analysed, no climate tracer can be produced for the UK, given the discontinuation of the construction survey in November 2019.

Graph 1.2.14: Radar Chart for Poland

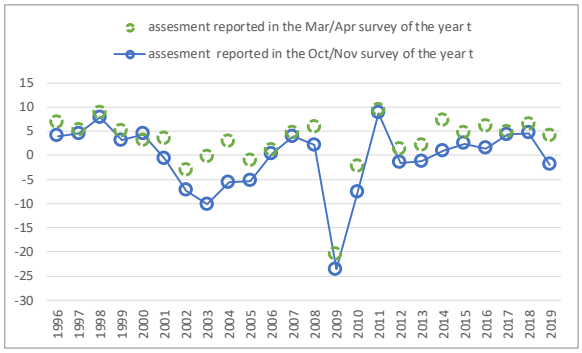


2. RESULTS OF THE AUTUMN 2019 EU INVESTMENT SURVEY IN THE MANUFACTURING SECTOR

Developments in overall investment

According to the Investment Survey carried out in October/November 2019, real manufacturing investment in the euro area is expected to have decreased by 2.0% in 2019 compared with 2018. Concerning 2020, manufacturers expect their investment to grow by 1.3%. Compared with the previous survey conducted in March/April 2019, managers revised their assessment for 2019 markedly downwards (by 6.0 pp). This corresponds to a typical pattern of revisions of investment plans over time. Over the past 20 years, the spring survey was on average overly optimistic and the autumn survey overly pessimistic compared to managers' ex-post assessment of investment growth once the year in question is over (see Graph 2.1). The discrepancy between the assessments in spring and autumn appears to widen when investment growth is low or negative.

Graph 2.1: Second versus third assessment of investment growth in the year t in the euro area (annual changes in %, in volumes)

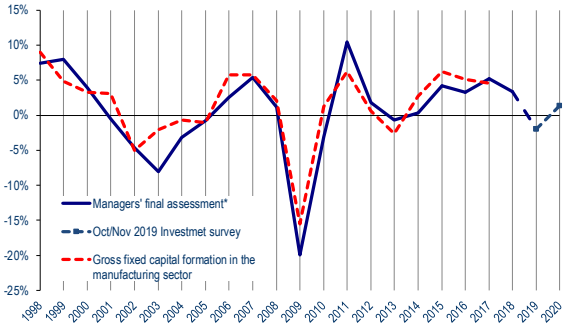


Source: Commission services and authors' calculations.

Turning to EU developments, manufacturing managers anticipate a decrease of 1.7% for investment in 2019 (down from +2.8% in March/April) and expect a rebound to +0.7% for 2020.

Graph 2.2 presents manufacturing managers' ex-post estimates of investment growth (surveyed in spring of the following year) along with an estimated euro-area series of Gross Fixed Capital Formation (GFCF) in the manufacturing sector. The two series co-move well together and the correlation between them is high at 0.92 (over the period 1998 to 2017).

Graph 2.2: Investment growth in the euro area (annual changes in %, in volumes)



**Mar/Apr year t surveys, managers' assessment of investment in year t-1.*
Source: Commission services and authors' calculations.

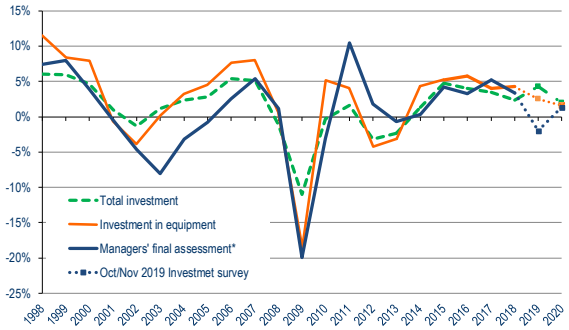
Graph 2.3 presents manufacturing managers' ex-post estimates of investment growth along with official Eurostat figures for total investment (GFCF) and equipment investment in the euro area,[4] as well as the respective Autumn Commission forecasts for these investment aggregates and the latest survey results for 2019 and 2020.

Generally, manufacturing managers' assessments co-move quite well with the outcomes of the two investment series; however, due to the imperfect conceptual match (manufacturing rather than total or equipment investment), the fit between the series is somewhat looser than with GFCF in the manufacturing sector. In particular between 2003 and 2006, manager's estimates from the survey are below the actual investment growth.

[4] These series are published by Eurostat also at EU and euro-area levels, including data up to 2018 (rather than 2017 as for the estimate of GFCF in manufacturing).

Also, while the recovery in equipment investment dynamics in 2010 was stronger than manufacturing managers' estimate, for 2011 and 2012, the results from the Investment Survey were significantly above the official Eurostat figures. Since 2013, results are broadly aligned again. Currently, manufacturing managers' views on 2019 (-2.0%) are far below the Commission's Autumn forecasts for total investment (+4.3%)[5] and investment in equipment (+2.5%). For 2020, manufacturing managers' expectations (+1.3%) are only slightly more pessimistic than the Commission's Autumn forecasts for both total (+2.0%) and equipment investment (+1.6%).

Graph 2.3: Investment growth in the euro area (annual changes in %, in volumes)



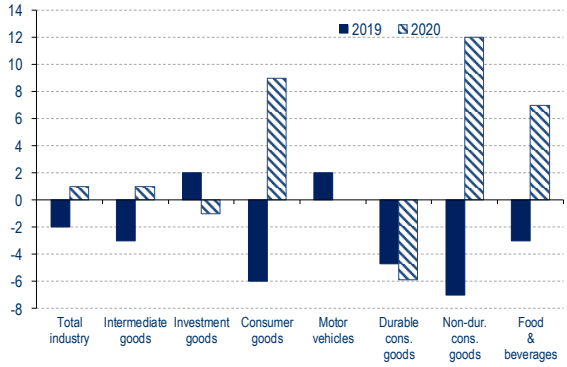
Note: Total and equipment investment data for 2019 and 2020 are Commission's Autumn 2019 forecasts.
**Mar/Apr year t surveys, managers' assessment of investment in year t-1.*
Source: Commission services.

Investment dynamics by sectors in the euro area

The sectoral breakdown of the survey (see Graph 2.4) shows that for 2019 only managers in the investment goods sector reported higher real investment compared with 2018, while the other sectors posted decreases (-3.0% in intermediate goods and -6.0% in consumer goods). Focussing on the drivers within these sectors, the decrease in the consumer goods sector is due to a decrease among firms producing both durable and non-durable consumption goods. Also managers in the sub-sector "food and beverages" reported a decrease in investment. Within the investment goods sector the branch 'manufacturing of motor vehicles' reports a broadly commensurate increase in investment in 2019.

For 2020, the situation reverses: managers in the intermediate and consumer goods sectors expect to increase their investment (by 1.0% and 9.0%, respectively), while managers in the investment goods sector expect real investment to slightly decrease. At the sub-sector level, manufacturers of motor vehicles expect unchanged investment compared to 2019, while managers in the non-durable consumer goods sector, including "food and beverages", expect sharp increases. By contrast, a further substantial decrease is expected for durable consumer goods.

Graph 2.4: 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.) or expected profits, technical (e.g. technological developments and the availability of labour) and other factors (e.g. policy measures, taxation and the possibility of moving production abroad).

For both 2019 and 2020, only the technical factor is reported as distinctly stimulating investment in the euro area (see upper panel of Graph 2.5). Demand is also considered as stimulating, but only by a slimmer majority of managers. By contrast, financial conditions/expected profits and other factors have been qualified as limiting by a majority of managers. From a long-term perspective, it is interesting to notice that while the assessment

[5] Available data for total investment in the first three quarters of 2019 indicate annual growth rates of +7.0% for the EA and +5.8 for the EU.

of technical and other factors has remained broadly stable since 2010, the role of demand and financial conditions/expected profits as factors driving investment decreased sharply compared to 2017/18 (lower panel of Graph 2.5).

Graph 2.5: 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.

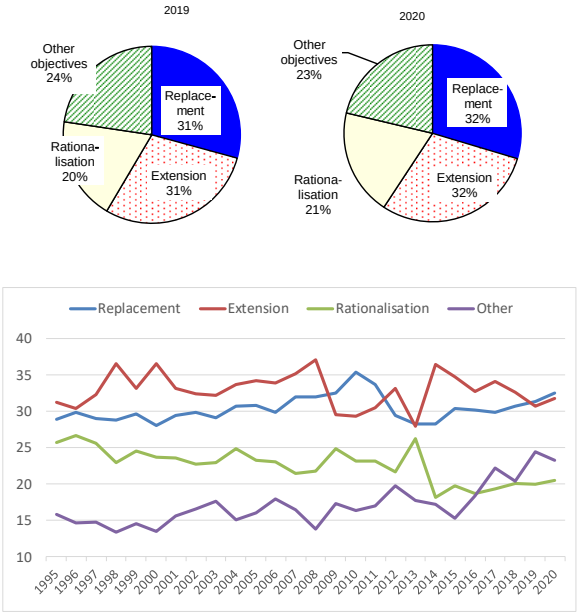
Investment structure

In order to get a more granular picture of the structure of investments, 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.).

In times of economic upswings, one would expect that investments are more geared towards the extension of production capacity than during downturns, where they are likely focused on replacement of worn-out equipment and/or rationalisation. Indeed, the relative share of investments that firms report as serving extension purposes is positively correlated with the growth rate in GFCF.

Graph 2.6 shows that some 31% of overall investment in 2019 was dedicated to the extension of production sites. This is 2 percentage points lower than what was reported in the autumn 2018 survey for investment in 2018. For 2020, the share of extension investment is expected to slightly increase again to 32%. The shares of investment dedicated to replacement and rationalisation remained roughly constant in 2019 at 31% and 20%, and are expected to edge up to 32% and 21% in 2020. The share of investment dedicated to other investment objectives (pollution control, safety, etc.) has been on the rise since 2016. In 2019, it represented 24%, and in 2020 it is expected to decrease only slightly to 23%

Graph 2.6: Investment structure in the euro area (percentage of total investment)

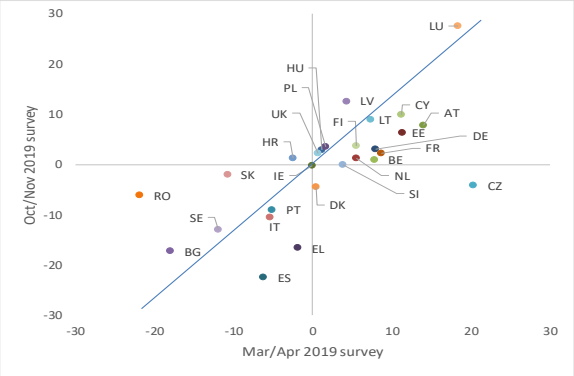


Source: Commission services.

Developments by country

At country level, in line with the aggregate evidence presented in Graph 2.1, managers in most EU Member States revised downward their assessment of investment growth in 2019 compared with the survey conducted in March/April (see Graph 2.7).

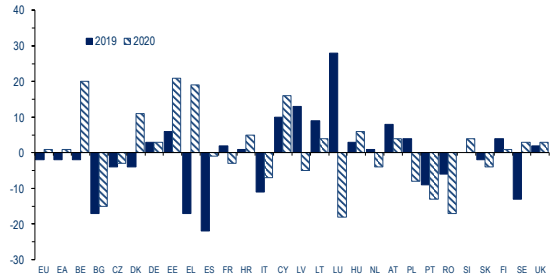
Graph 2.7: Surveyed change of investments for the year 2019 in EU Member States, Mar/Apr versus Oct/Nov 2019 survey (in % changes)



Note: Malta, where managers revised their investment assessment for 2019 from -4.1% to -66.1%), is not shown in the graph.
Source: Commission services.

Managers in half of the countries reported an increase in real investment for 2019 (see Graph 2.8). Of the other half, managers in 12 EU Member States reported a decline in investments and managers in two countries expect investment to remain at the same level as in 2018. For 2020, managers in 15 countries expect an increase, while managers in 13 countries expect to decrease investment. Concerning the seven largest Member States, manufacturing managers assessed their investment in 2019 to have increased in Germany, France, the Netherlands, Poland and the UK, while managers in Spain and Italy estimated a significant decline. In 2020, investments are expected to decrease also in France, the Netherlands and Poland. Concerning the decrease reported in Italy, it has to be noted that the historic record of managers' assessments of investment growth in the autumn survey shows a persistent negative bias compared to hard data and should thus not be taken at face value.

Graph 2.8: Surveyed change of investments in the EU Member States (annual changes in %)

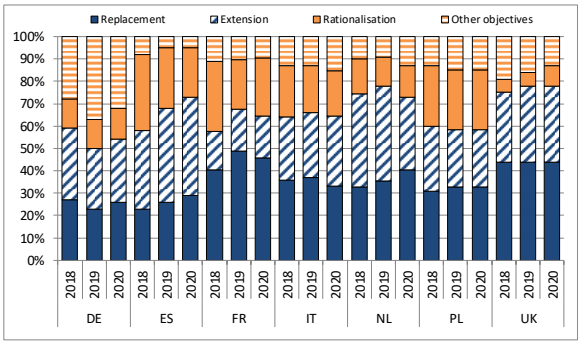


Source: Commission services.

The graphs in the annex to this section compare large Member States' investment survey results to the Commission's Autumn forecasts for GFCF and equipment investment.

The structure of investment in 2019 varies across countries (see Graph 2.9). In Germany, investment has predominantly served "other objectives" (such as pollution control, safety, etc.) for the first time in 2019. In Spain and the Netherlands, investments were done mainly for extension purposes, while in France, Italy, Poland and the UK investment has been driven mainly by replacement needs. The picture remains broadly the same for 2020.

Graph 2.9: Structure of investments in the big Member States in 2018, 2019 and 2020 (share in %)



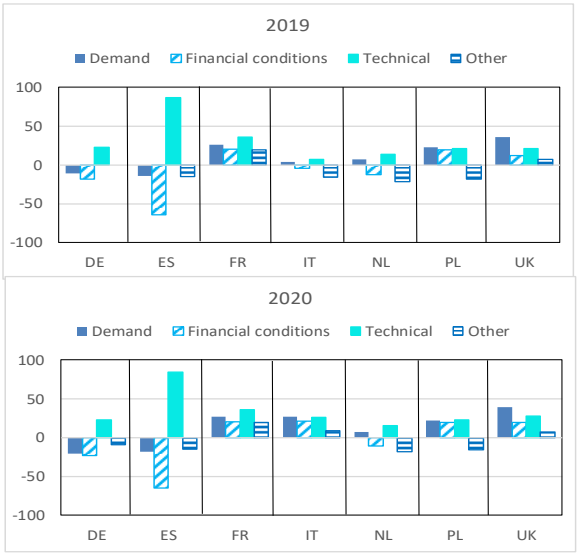
Source: Commission services.

Graph 2.10 shows which factors are stimulating or limiting investment in the largest Member States in 2019 and 2020. The most interesting are arguably the demand and financial factors. Demand seems to have exerted a stimulating effect on investment in five out of the seven largest EU Member States. By contrast, in Germany and Spain most of the managers assessed demand as a factor limiting investment. Financial conditions/expected profits are reported to have promoted investment activity only in France, Poland and the UK, while financial conditions are assed as

a limiting factor in Germany, Spain Italy and the Netherlands.

The described patterns change very little for 2020. The main exception is Italy, where all the factors become very supportive of investment. These positive expectations for 2020 partly relativise the earlier finding that Italian managers currently expect investments to decline further in real terms in 2020.

Graph 2.10: Factors influencing investment decisions in large EU Member States in 2019 and 2020 (balance statistic)



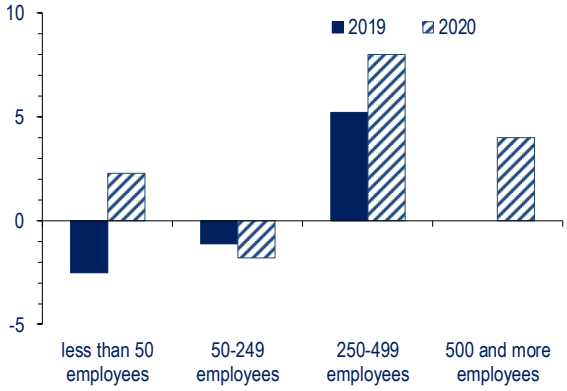
Notes: see Graph 2.5
Source: Commission services.

A closer look at developments in investment by enterprise size

According to the survey, only large firms (employing between 250 and 499 persons) experienced an expansion in real investment in 2019. By contrast, small and medium firms (employing up to 50 people, and between 50 and 249 people, respectively) reported a contraction in investment. Real investment by very large enterprises (employing 500 or more persons) remained broadly unchanged compared with 2018 (see Graph 2.11). Though not directly comparable[6], the latest version of the ECB's access-to-finance survey[7] shows that the majority of euro-area SMEs continued to report rising fixed investments, but the net percentage of firms reporting an increase is declining. While this dynamic applied to firms in all size categories, the decline in net percentages for large firms was higher than for SMEs.

For 2020, the prospects are better for small, large and very large enterprises, which project to increase their investments (by 2%, 8% and 4%, respectively), while managers in medium-sized firms expect a decrease in their investment by 2%.

Graph 2.11: Surveyed change of investments in the euro area by company 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 decreased in 2019 and is foreseen to rebound in 2020. The rate expected for the euro area in 2019 (-2.0%) is far below the Commission's Autumn forecasts for total (+4.9%) and equipment investment (+2.5%), while manufacturing managers' expectations for 2020 (+1.3%) are only slightly lower than the Commission's Autumn forecast for both total (+2.0%) and equipment investment (+1.6%). It has to be

[6] In addition to the manufacturing industry, the ECB Survey on the Access to Finance of Enterprises (SAFE) covers also enterprises from mining and quarrying, construction, trade and other services economic activities. Country coverage is also different from the investment survey presented in this note.

[7] For further details see: https://www.ecb.europa.eu/stats/ecb_surveys/safe/html/index.en.html

noted that a rather negative assessment of investment activity in the ongoing year appears to be a pervasive feature of the autumn survey.

Of the investments reported for 2019, some 31% were dedicated to the extension of production sites, which is a type of investment particularly prevalent in times of economic upswings. This means a decrease of two percentage points compared to 2018 and of five percentage points compared to the previous peak recorded in 2014. For 2020, the share of extension investment is expected to edge up again by one percentage point. Interestingly, other investment objectives (pollution control, safety, etc.) appear to have gained importance over recent years.

Turning to the factors influencing investment, demand and technical factors were reported to have had a stimulating effect in 2019 and to continue to play a positive role in 2020, while financial conditions/expected profits and other factors have been qualified as limiting, in both 2019 and 2020, by the greater part of managers.

From a sectoral perspective, results show that for 2019 only managers in the investment goods sector reported higher real investment compared with 2018. For 2020 the situation reverses: managers in the intermediate and consumer goods sectors expect to increase their investment, while managers in the investment goods sector expect real investment to slightly decrease.

Compared with the previous survey conducted in March/April 2019, managers in most of the EU Member States revised downwards their assessment for 2019. As a result, managers in only half of the countries still reported an increase in real investment for 2019. For 2020, the number of Member States where managers expect an increase in investment rises slightly from 14 to 15.

3. SPECIAL TOPIC: A NEW EMPLOYMENT INDEX FOR THE EURO AREA BASED ON SECTORAL EMPLOYMENT EXPECTATIONS

Introduction

This special topic presents an analytical framework to construct an employment index for the euro area. The new index complements the information about macroeconomic developments provided by other, output-related survey indicators released by the European Commission, such as the Economic Sentiment Indicator (ESI). It can be useful for monitoring the main trends affecting the euro area labour market and provides an additional source of information to be included in forecasting models of employment changes. The creation of a new survey-based employment index is also in line with, and may help support and strengthen, the economic narrative of the new European Commission, which stresses social fairness, inclusive growth and prosperity.

Eurostat produces employment data related to the euro area on a quarterly basis. According to the Eurostat calendar for 2019[8], the flash employment estimates are usually released 45 days after the end of the quarter, while the regular estimates are produced 65 days after. Constructing an employment index using data collected by the Harmonised Business and Consumer Survey (BCS) could allow policy makers to get an idea of short-term employment trends in advance of the Eurostat releases. Indeed, BCS data are collected on a monthly basis and published at the end of the month they refer to.

Analysis of sectoral employment expectations

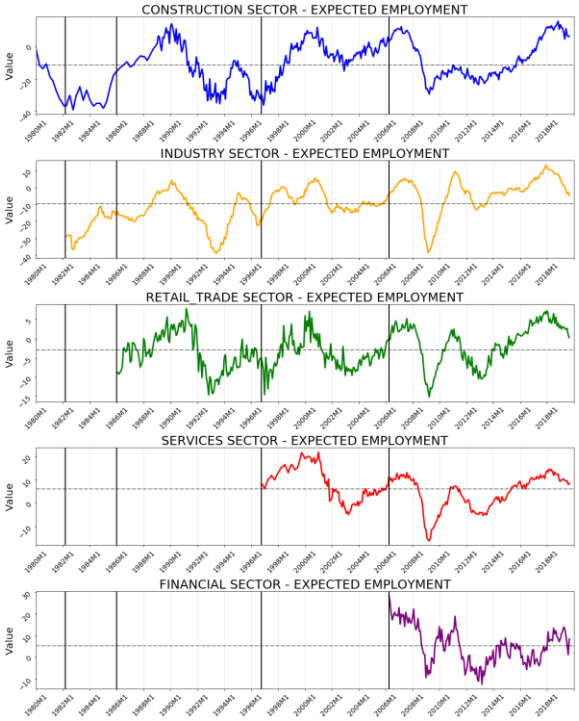
To construct the index, the sectoral employment expectations collected by the Harmonised Business and Consumer Survey have been used. The survey has been collecting information on employment trends for several decades by asking firms in different sectors the following question:

How do you expect your firm's total employment to change over the next three months? It will…

- *Increase*
- *Remain unchanged*
- *Decrease*

The answers to this question are aggregated and transformed in balance series (i.e. % of positive replies minus % of negative replies). Five sectors are covered by the Business and Consumer Surveys. A graphical representation of the series is shown in Graph 2.1.

Graph 2.1: Employment Expectations in different sectors in the euro area



[8] The calendar 2019-2020 can be found here https://ec.europa.eu/eurostat/documents/24987/6642470/QNA_release_calendar.pdf

Tables 2.1 and 2.2 report contemporaneous correlations and directional accuracies[9] between sectoral employment expectations and total and sectoral (according to the NACE Rev.2 classification[10]) employment growth respectively[11]. To compute correlations and directional accuracies, monthly expectations date are converted in quarterly data by averaging the three months of each quarter. The reason behind this conversion is that monthly data related to employment are not available. Results are reported for the time span 2000Q1-2019Q2[12] (without the financial sector) and 2006Q1-2019Q2 (including the financial sector)[13].

Table 2.1: Correlations and Directional Accuracies between sectoral expectations and sectoral/total employment growth (2000Q1-2019Q2)

Correlations 2000Q1-2019Q2

Employment Growth (qoq)	Employment Expectations			
	CONSTRUCTION	INDUSTRY	RETAIL_TRADE	SERVICES
Total NACE	0.775	0.709	0.757	0.841
F	0.741			
C		0.900		
B-E		0.905		
G-I			0.617	
G-U (Not O-Q)				0.787

Directional Accuracies 2000Q1-2019Q2

Employment Growth (qoq)	Employment Expectations			
	CONSTRUCTION	INDUSTRY	RETAIL_TRADE	SERVICES
Total NACE	0.610	0.584	0.597	0.558
F	0.610			
C		0.701		
B-E		0.701		
G-I			0.636	
G-U (Not O-Q)				0.595

From table 2.1, it can be seen that expectations in each sector are highly correlated with total employment growth (qoq). Indeed, correlations are always higher than 0.7. The services sector appears to be the most correlated with total employment growth. With regard to directional accuracies, values are always higher than 0.5.

Concerning correlations between sectorial expectations and sectoral employment growth (*qoq*), the highest correlation is for the industry sector. Industry expectations highly correlate with the manufacturing sector (coefficient around 0.9).

Table 2.2: Correlations and Directional Accuracies between sectoral expectations and sectoral/total employment growth (2006Q1-2019Q2)

Correlations 2006Q2-2019Q2

Employment Growth (qoq)	Employment Expectations				
	CONSTRUCTION	INDUSTRY	RETAIL_TRADE	SERVICES	FINANCIAL
Total NACE	0.755	0.827	0.868	0.899	0.532
F	0.754				
C		0.917			
B-E		0.920			
G-I			0.761		
G-U (Not O-Q)				0.859	
K					0.375

Directional Accuracies 2006Q2-2019Q2

Employment Growth (qoq)	Employment Expectations				
	CONSTRUCTION	INDUSTRY	RETAIL_TRADE	SERVICES	FINANCIAL
Total NACE	0.623	0.660	0.623	0.635	0.679
F	0.604				
C		0.736			
B-E		0.717			
G-I			0.604		
G-U (Not O-Q)				0.635	
K					0.453

Furthermore, they correlate marginally better with the entire industry sector, suggesting that even if the expectations data are collected in manufacturing, they are still able to reflect the movements in the whole industry sector. High correlations are also registered in the services and construction sectors, while a lower correlation is reported in the retail trade sector. Regarding accuracies, values are close to or above 0.6 for all sectors.

Comparing the shorter time span as from 2006 (Table 2.2), it can be noticed that both correlations and accuracies increase for most of the combinations considered. Furthermore, financial employment expectations are comparably lowly correlated with both total employment growth and employment growth in the financial sector. Although directional accuracy with total employment growth is in line with the others, directional accuracy with

[9] Accuracies are computed by identifying the direction of the growth rate for both actual and expected employment and then constructing a confusion matrix to see how many times the expectation was fulfilled.

[10] It was not possible to operate a real comparison for the services and the retail trade sectors. BCS's employment expectations of these sectors are collected respectively in H-U (Not O-S) and G45-46. Unfortunately, actual employment data provide different aggregate. This obstacle was minimized by choosing aggregates that are the closest as possible to the sectors in which the expectations are taken

[11] Actual employment growth (total and sectoral) is computed using employment levels (domestic concept) taken from national accounts.

[12] Expectations are analysed starting from 2000, which is from when the annual employment data (on which their subsequent aggregation in an employment index is based) are available.

[13] The survey in the financial services sector was only launched in 2006.

employment growth in the financial sector is below 0.5, which represents the minimum threshold for a useful predictor. The empirical evidence thus suggests to not include the financial employment expectations in the aggregate indicator[14]. What is more, the exclusion of the financial sector allows the calculation over a longer time span starting in 2000.

From a now- and forecasting perspective, it is important whether employment expectations are leading or lagging total employment growth and sectoral employment growth. To this end, correlations between the employment expectations at time *t* and the employment growth at time *t-k* and *t+k* are computed. In this case, instead of averaging over the three months of the quarters, the reported correlations are related to each month of the quarter (i.e. expectations collected in the first, second and third month).

Table 2.3: Correlations between sectoral expectations and total employment growth

First Month of the Quarter — Employment Expectations

Total Employment Growth (qoq)	CONSTRUCTION	INDUSTRY	RETAIL_TRADE	SERVICES
LAG(2)	0.824	0.708	0.726	0.862
LAG(1)	0.818	0.739	0.773	0.871
Contemporaneous	0.759	0.670	0.720	0.791
LEAD(1)	0.640	0.518	0.572	0.634
LEAD(2)	0.504	0.335	0.398	0.444

Second Month of the Quarter — Employment Expectations

Total Employment Growth (qoq)	CONSTRUCTION	INDUSTRY	RETAIL_TRADE	SERVICES
LAG(2)	0.793	0.682	0.723	0.851
LAG(1)	0.803	0.740	0.779	0.888
Contemporaneous	0.761	0.708	0.728	0.843
LEAD(1)	0.668	0.590	0.625	0.697
LEAD(2)	0.532	0.405	0.449	0.522

Last Month of the Quarter — Employment Expectations

Total Employment Growth (qoq)	CONSTRUCTION	INDUSTRY	RETAIL_TRADE	SERVICES
LAG(2)	0.764	0.642	0.657	0.823
LAG(1)	0.812	0.730	0.750	0.874
Contemporaneous	0.780	0.731	0.771	0.858
LEAD(1)	0.703	0.646	0.687	0.754
LEAD(2)	0.568	0.464	0.511	0.578

In Table 2.3, correlations between total employment growth (*qoq*) and sectorial expectations collected in each of the three months of a quarter are reported. Red values correspond to the highest correlations.

Some specific patterns can be noticed. When considering expectations collected in the first month of the quarter, the highest correlations with total employment occur at *t-2* for the construction sector and at *t-1* for industry, construction and services sector. By contrast, when considering expectations from the last month of the quarter, the highest correlations with total employment are reached at *t-1* for the construction and the services sectors and at time t for the industry and retail trade sectors. This means that the expectations collected in the last month of each quarter are more informative for the current quarter than the first observations of the quarter, which tend to better match employment growth in the previous quarter: lagging correlations are usually higher when considering the first month of the quarter, and contemporaneous correlations always increase when considering the last month of the quarter.

A similar pattern is shown also by the correlations with sectoral employment growth. Results are shown in Table 2.4.

Table 2.4: Correlations between sectoral expectations and sectoral employment growth

First Month of the Quarter — Employment Expectations

Sectoral Employment Growth (qoq)	CONSTRUCTION and F	INDUSTRY and C	INDUSTRY and B-E	RETAIL_TRADE and G-I	SERVICES and G-U (Not O-Q)
LAG(2)	0.837	0.765	0.772	0.598	0.812
LAG(1)	0.800	0.875	0.881	0.607	0.824
Contemporaneous	0.715	0.887	0.891	0.573	0.732
LEAD(1)	0.605	0.772	0.777	0.447	0.578
LEAD(2)	0.509	0.582	0.581	0.305	0.395

Second Month of the Quarter — Employment Expectations

Sectoral Employment Growth (qoq)	CONSTRUCTION and F	INDUSTRY and C	INDUSTRY and B-E	RETAIL_TRADE and G-I	SERVICES and G-U (Not O-Q)
LAG(2)	0.820	0.707	0.714	0.595	0.794
LAG(1)	0.799	0.847	0.854	0.650	0.839
Contemporaneous	0.735	0.900	0.904	0.600	0.791
LEAD(1)	0.632	0.831	0.834	0.499	0.634
LEAD(2)	0.522	0.657	0.659	0.378	0.470

Last Month of the Quarter — Employment Expectations

Sectoral Employment Growth (qoq)	CONSTRUCTION and F	INDUSTRY and C	INDUSTRY and B-E	RETAIL_TRADE and G-I	SERVICES and G-U (Not O-Q)
LAG(2)	0.813	0.628	0.635	0.539	0.761
LAG(1)	0.807	0.805	0.811	0.615	0.822
Contemporaneous	0.750	0.893	0.898	0.637	0.810
LEAD(1)	0.660	0.870	0.873	0.528	0.699
LEAD(2)	0.545	0.727	0.730	0.394	0.518

Overall, the results suggest that the employment expectations collected by the BCS are able to reflect movements in both total employment growth and sectoral

[14] In some Member States, the BCS sample covering the service sector also includes firms of the financial sector. Thus, it can be assumed that services employment expectations already contain some information related to financial employment expectation. Moreover, the financial employment share is very low, around 4% of total employment.

employment growth. Considering only the observations collected in the last month of each quarter, expectations in industry and retail trade move contemporaneously with growth realisations (that will only be published one and a half, respectively two months later), while expectations in services and construction are statistically lagging total employment growth by one quarter. Nevertheless, even if these two series out of four are lagging, contemporaneous correlations remain particularly high also for construction and services.

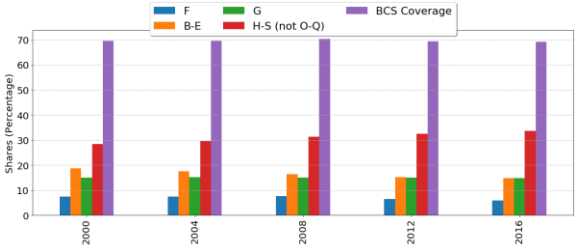
As to the expectations collected in the first and second month of the quarter, correlations with employment growth outcomes are usually not significantly lower, i.e. survey expectations can already give very early indications of trends in employment growth that will only be published several months later.

BCS Employment Coverage

In order to construct a good indicator, it is important that the data collected by the Business and Consumer Survey are representative of a conspicuous part of the total employment in the euro area and to understand how large the BCS employment coverage is.

Figure 2 displays the evolution of the employment shares in the sectors covered by the BCS, together with the evolution of the total BCS employment coverage from 2000 to 2016[15]

Graph 2.2: Employment Shares and BCS Employment Coverage (sectors according NACE Rev.2.0 classification)



Although the total BCS employment coverage did not substantially change from 2000 to 2016 (passing from 69.5% to 69.2%), the bar chart shows that its composition faced notable movements. Employment shares in construction, retail trade and, especially, industry have decreased (construction from 7.4% to 5.9%, retail trade from 14.9% to 14.7% and industry from 17.8% to 14.8%). By contrast, the services employment share has systematically increased, rising from 28.5% in 2000 to 33.7% in 2016.

Considering that around 24% of individuals in the euro area were employed in public administration, defence, education, human health and social work activities (O-Q according to the NACE Rev.2 classification) in 2016, the analysis confirms that the BCS covers a remarkable part of private sector employment in the euro area. Thus, an employment indicator constructed with its data is likely to reflect movements also in total employment, given the relative inertia of public sector employment.

Constructing the Employment Index

To construct the index, the different sectoral employment expectations need to be aggregated by applying appropriate weights. Three different methods to compute weights are considered and four different indicators are constructed, following the same construction procedure of the ESI.

1) Weights computed using sectoral employment shares. Weights for each sector are computed as a proportion of the sectoral employment share over the BCS employment coverage in the period 2003-2016. Two different indicators are constructed using these weights:
   a) Employment Indicator using weights averaged over the period 2003-2016;
   b) Employment Indicator using moving weights in the period 2003-2019[16]

[15] Employment data are annual. In this case, it was possible to check the exact sectors in which the expectations are collected (according to NACE Rev2.0) because annual employment data offer a much more complete sectoral breakdown.

[16] Annual employment data are updated until 2016. For the years 2017, 2018 and 2019 weights are the same as 2016

2) Weights used are the same as for the Sentiment Economic Indicator (ESI)[17] Weights for each sector are appropriately re-computed[18] using the same proportion as applied in the ESI.

3) Weights computed using Principal Component Analysis. Using Principal Component Analysis, the principal component[19] is extracted from the four different sectoral employment expectations. Then, the principal component is regressed on the four expectations and the partial correlations are estimated through an OLS model. Weights are computed proportionally to these partial correlations.

The different weights applied to the four indicators are reported in Table 2.5.

Table 2.5: Weights applied to the four indicators

		CONSTRUCTION	INDUSTRY	RETAIL_TRADE	SERVICES
Employment Shares (Weights obtained by averaging over time)		0.101	0.237	0.216	0.445
Employment Shares (Moving Weights)	2000	0.106	0.270	0.215	0.409
	2016	0.086	0.214	0.211	0.489
ESI Weights		0.063	0.500	0.063	0.375
PCA Weights		0.235	0.247	0.257	0.261

Weights based on the time average of the employment shares give higher importance to services, similar importance to industry and retail trade and lower importance to construction. An analogous pattern is maintained in the moving weights. From 2003 and 2016 the weight applied to the services increases by around 7 percentage points, while the ones applied to industry and construction decreases by around 2 and 4 percentage points respectively. The weight applied to the retail trade sector remains broadly the same.

Assessing the quality of the indexes

The four monthly indexes are represented in Graph 2.3, together with quarterly employment growth.

Graph 2.3: Comparison between the monthly employment indexes and the quarterly employment growth

The four indicators do not differ much from each other. The two indexes constructed using weights related to the employment shares are almost coinciding (correlation between these two indexes is 0.99). The main divergences can be found by comparing the indexes constructed using the ESI and PCA weights. The first index presents lower values at the peak of the crisis (2008-2009) and in the more recent years (2018-2019), while it assumes higher values between 2011 and 2014. Anyhow, correlations between these indicators range between 0.98 and 0.99, confirming that the differences from the application of the four kinds of weights are not substantial Furthermore, from a graphical overview, it is evident that the four indicators closely reflect movements in total employment growth.

In order to conduct a quality assessment, the four indexes are compared with employment growth in the euro area. Correlations and directional accuracies are computed as it was done for the four sectoral employment expectations. Moreover, correlations and accuracies are also computed for IHS Markit's Composite PMI Employment Index as a performance benchmark. Here again, since employment data are quarterly, monthly indicators are transformed into quarterly indicators by averaging over the three months of each quarter.

17 More info about the ESI can be found on the "Methodological User Guide to the Joint Harmonised EU Programme of Business and Consumer Surveys" (https://ec.europa.eu/info/files/user-guide-joint-harmonised-eu-programme-business-and-consumer-surveys_en)

18 Weights were re-computed by excluding the consumers share. Acknowledging the continued role of the manufacturing sector as the cycle-maker of the economy and the fact that the manufacturing survey has a better signal-to-noise ratio than the other surveys, the manufacturing sector receives the highest weight in the computation of the ESI (40%).

19 The extracted principal component was able to explain more than 80% of the total variance of the four employment expectations.

Table 2.6 reports correlations and accuracies between the employment indicators and total employment growth.

Table 2.6: Correlations and accuracies between the employment indexes and employment growth

Sample 2000Q1-2019Q2	CORRELATIONS	ACCURACIES	TPR	TNR
Empl. Index - Empl. Shares (avg.)	0.835	0.571	0.605	0.529
Empl. Index - Empl. Shares (moving)	0.832	0.517	0.605	0.529
Empl. Index - Weights based on ESI	0.811	0.558	0.581	0.529
Empl. Index - Weights based on PCA	0.837	0.584	0.628	0.529
MARKIT PMI Empl. Index	0.827	0.519	0.535	0.500

Contemporaneous correlations are particularly high, ranging from 0.81 for the index based on the ESI weights to 0.84 for the index based on PCA weights. Accuracies, also, are always higher than 0.5. The table also presents the True Positive and True Negative rates to check if, in proportion, the indicators are better able to predict increases or decrease in employment growth. TPRs are always higher than the TNRs, confirming that the indicators perform slightly better in predicting increases rather than decreases.

Compared to Markit's PMI Employment Index, all indexes perform better in terms of directional accuracy and three indexes out of four perform better in terms of correlations.

Lagging or leading indicators?

Table 2.7 presents, for each of the composite indicators, the leading and lagging correlations between the three monthly expectations on the one hand and total employment growth on the other. The period considered is always 2000Q1-2019Q2

Table 2.7 Correlations between Employment Indexes (different months of the quarters) and total employment growth

First Month of the Quarter — Employment Expectations

Total Employment Growth (q-o-q)	BCS - based employment indexes				MARKIT PMI Employment Index
	Empl. Shares (avg.)	Empl. Shares (moving)	weights based on ESI	weights based on PCA	
LAG(2)	0.846	0.843	0.820	0.849	0.806
LAG(1)	0.870	0.867	0.845	0.872	0.851
Contemporaneous	0.797	0.794	0.771	0.801	0.795
LEAD(1)	0.637	0.637	0.610	0.644	0.651
LEAD(2)	0.444	0.447	0.416	0.457	0.474

Second Month of the Quarter — Employment Expectations

Total Employment Growth (qoq)	BCS - based employment indexes				MARKIT PMI Employment Index
	Empl. Shares (avg.)	Empl. Shares (moving)	weights based on ESI	weights based on PCA	
LAG(2)	0.828	0.822	0.797	0.830	0.742
LAG(1)	0.875	0.870	0.849	0.874	0.820
Contemporaneous	0.831	0.829	0.811	0.829	0.813
LEAD(1)	0.698	0.699	0.678	0.704	0.688
LEAD(2)	0.513	0.516	0.489	0.520	0.517

Last Month of the Quarter — Employment Expectations

Total Employment Growth (qoq)	BCS - based employment indexes				MARKIT PMI Employment Index
	Empl. Shares (avg.)	Empl. Shares (moving)	weights based on ESI	weights based on PCA	
LAG(2)	0.787	0.782	0.757	0.788	0.714
LAG(1)	0.864	0.860	0.837	0.867	0.819
Contemporaneous	0.859	0.854	0.833	0.861	0.842
LEAD(1)	0.759	0.758	0.735	0.764	0.751
LEAD(2)	0.574	0.575	0.548	0.580	0.594

Across the board, the correlation of the indicators with employment growth in the preceding quarter is the highest, suggesting that all indicators are lagging by one quarter. Nevertheless, by comparing correlations at the beginning and at the end of the quarter, it can be noticed that lagging correlations decrease when considering the last month and that contemporaneous correlations increase and almost equal the maximum lagging correlations in the third month of the quarter. The indicators collected in the third month of the quarter can therefore be regarded as roughly contemporaneous indicators for employment growth.

A similar pattern can be observed for Markit's PMI. By considering the first and the second month, the indicator is lagging by one quarter but by using the last observation of the quarter, the lag disappears fully. Yet, even if the index's last observations of the quarter are truly coincident with employment growth, the contemporaneous correlation, and thus the information content of the observation for the growth outcome, remains somewhat lower than for most of the BCS-based indicators.

Country-level indicators

Country-level indicators for selected Member States of both the euro area and the EU are constructed analogously in order to check if the country-specific indicators are able to mirror national employment growth with any similar accuracy. The same weights used for the euro area indicators are applied. The countries under investigation are Germany, France, Italy, Spain and Netherlands, i.e. the big five of the euro area, and the United Kingdom, Poland and Sweden, as the big non-euro area Members. In 2017, these countries together constituted around 80% and 75% of total employment in the euro area and the EU respectively. Graph 2.4 presents the quarterly indicators for each country compared to the quarterly employment growth[20].

[20] Monthly indicators were transformed into quarterly by averaging over the three months of the quarter.

Graph 2.4: Comparison between employment indexes and total employment growth in selected European Union countries

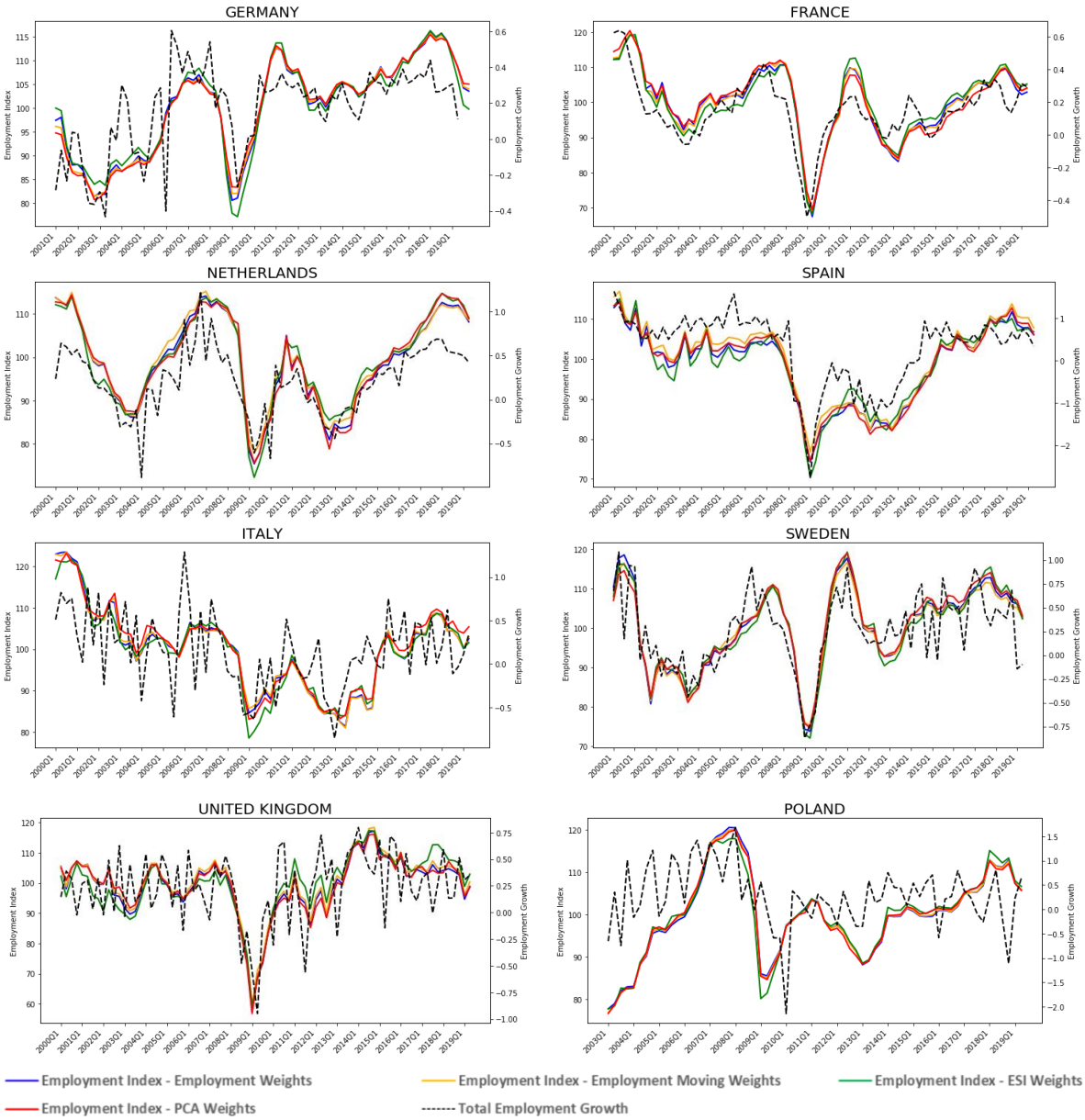


Table 2.8: Correlations and Directional Accuracies Comparison between employment indexes and employment growth in selected European Union countries

GERMANY	CORRELATIONS	ACCURACIES
Employment Index - Weights based on Employment Shares	0.710	0.594
Employment Index - Moving Weights based on Employment Shares	0.717	0.609
Employment Index - Weights based on ESI	0.692	0.625
Employment Index - Weights based on PCA	0.725	0.609

ACCURACIES	CORRELATIONS	ITALY
0.468	0.528	Employment Index - Weights based on Employment Shares
0.481	0.559	Employment Index - Moving Weights based on Employment Shares
0.558	0.542	Employment Index - Weights based on ESI
0.455	0.529	Employment Index - Weights based on PCA

SPAIN	CORRELATIONS	ACCURACIES
Employment Index - Weights based on Employment Shares	0.865	0.494
Employment Index - Moving Weights based on Employment Shares	0.866	0.481
Employment Index - Weights based on ESI	0.846	0.545
Employment Index - Weights based on PCA	0.874	0.532

ACCURACIES	CORRELATIONS	SWEDEN
0.558	0.787	Employment Index - Weights based on Employment Shares
0.558	0.787	Employment Index - Moving Weights based on Employment Shares
0.532	0.766	Employment Index - Weights based on ESI
0.571	0.779	Employment Index - Weights based on PCA

FRANCE	CORRELATIONS	ACCURACIES
Employment Index - Weights based on Employment Shares	0.820	0.609
Employment Index - Moving Weights based on Employment Shares	0.823	0.609
Employment Index - Weights based on ESI	0.817	0.625
Employment Index - Weights based on PCA	0.813	0.609

ACCURACIES	CORRELATIONS	UNITED KINGDOM
0.558	0.551	Employment Index - Weights based on Employment Shares
0.571	0.554	Employment Index - Moving Weights based on Employment Shares
0.636	0.553	Employment Index - Weights based on ESI
0.597	0.554	Employment Index - Weights based on PCA

NETHERLANDS	CORRELATIONS	ACCURACIES
Employment Index - Weights based on Employment Shares	0.854	0.649
Employment Index - Moving Weights based on Employment Shares	0.859	0.636
Employment Index - Weights based on ESI	0.849	0.623
Employment Index - Weights based on PCA	0.848	0.688

ACCURACIES	CORRELATIONS	POLAND
0.431	0.343	Employment Index - Weights based on Employment Shares
0.446	0.353	Employment Index - Moving Weights based on Employment Shares
0.477	0.343	Employment Index - Weights based on ESI
0.446	0.363	Employment Index - Weights based on PCA

Concerning euro area countries, the indicators seem to reflect very closely employment growth in Germany (especially from 2008), France, Spain and the Netherlands. In Italy, the high volatility of employment growth is not captured by the employment expectations.

Regarding non-euro area countries, the indicators seem to be close to official employment growth in Sweden but less closely related in Poland. In the UK, despite a rather low correlation between the series, the indicators are still able to catch the main trends.

Overall, because of the lower period-on-period volatility of the expectations, in countries where employment growth is highly volatile, the indicators are not able to capture this volatility. Given that the indicators are not meant to be point forecasts of employment growth but to give an indication of the trends over the medium-term, this may actually be considered as an advantage.

Contemporaneous correlations and directional accuracies for each country are reported in Table 2.8[21]. Spain, Netherlands and France are the countries with the highest correlation (more than 0.8), followed by Sweden and Germany (more than 0.7). Lower correlations are reported in Italy, the UK (more than 0.5) and Poland (around 0.3).

Now-cast exercise

To understand if the employment indicators are able to add information that can be useful for nowcasting quarterly employment, a now-cast exercise is presented in this section.

The approach is rather simple. Two different models are employed: a benchmark autoregressive model AR(1), in which contemporaneous employment growth depends on its lagged value, and an autoregressive distributed lagged models ARDL(1,1), where contemporaneous employment growth depends on its lagged values together with the contemporaneous employment indicator and the lagged employment indicator. The results presented here are related to the index based on PCA weights, considering the first, the second and the last month of the quarter.[22]

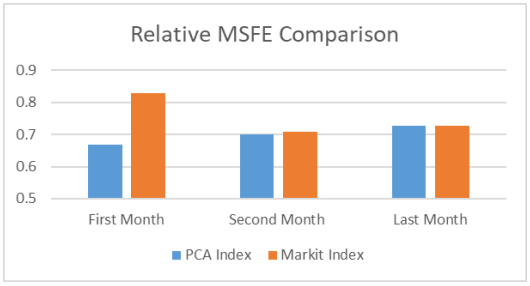
The exercise proceeds as follow:

- The period of the exercise goes from 2000Q3 to 2019Q2;
- The first 25 observations are used as the initial estimation period for the models;
- Coefficients are estimated and the prediction for the current period is formulated;
- The exercise is repeated by enlarging the estimation sample by one observation.
- Current employment growth is estimated until the end of the observations.

After having computed the predictions for each time, the Relative Mean Squared Forecasting Errors[23] are computed.

The same procedure is applied to an ARDL(1,1) model in which the main regressor is Markit's Composite PMI Employment Index. This allows comparing the two indexes. Results are summarised in Graph 2.5.

Graph 2.5: Relative MSFE Comparison



[21] All correlations and directional accuracies are related to the period 2000Q1-2019Q2 for all the countries except for Germany (2001Q1-2019Q2) and Poland (2003Q2-2019Q2).

[22] The choice is based on the fact that the index based on PCA weights is the most correlated to employment growth. In any case, very similar results are obtained when using the other indexes.

[23] The MSFE of each ARDL(1,1) model is divided by the MSFE of the AR(1). A value lower than one implies that the ARDL(1,1) model performs better than the benchmark. The best ARDL(1,1) model is the one with the lowest RMSFE value.

Both ARDL(1,1) models including the two indexes lead to more accurate predictions than the benchmark models (relative MSFE are always lower than 1).

By considering the first month of the quarter, the model including the BCS index based on PCA weights performs much better. The difference gets markedly reduced when considering the second month of the quarter, but still the model with the BCS index (PCA) behaves marginally better. Finally, by considering the last month of the quarter, the two expectations indicators perform virtually identically well in reducing the nowcast error.

Conclusions

Four different employment indexes were constructed using data on sectoral employment expectations collected by the Harmonised Business and Consumer Survey.

In order to allow a comparison with quarterly employment data, monthly expectations were transformed to quarterly data in several ways. When averaging over the three months of the quarter, these expectations are highly correlated with both total and sectoral employment growth and directional accuracies are always higher than 0.5. By considering only observations in the first month of the quarter, the expectations show some lagging properties which are reduced or disappear when the expectations collected in the last month of the quarter are examined. Considering the significant publication delay of statistical information on employment growth, the presented indicators do contain valuable information on employment trends during the quarter.

The weighting systems used for the aggregation of the sectoral expectations do not lead to significantly different results. The four composite indexes derived from the expectations are all highly correlated with total employment growth (correlations are always around or higher than 0.8). From a conceptual point of view, the indicator based on sectoral employment shares appears preferable.

The indicators collected early in the quarter are lagging one quarter, but contemporaneous correlations, especially the ones based on expectations from the last month of the quarter, are very high and the difference between lagging and contemporaneous correlation is marginal. Moreover, both correlations and directional accuracies of the indicators are marginally higher than the ones related to comparable available employment indicators such as Markit's Composite PMI Employment Indicator.

The construction of the country-specific indicators showed that very good performances are reached in Spain, France, Netherlands, Sweden and Germany, while in those countries where employment growth is highly volatile (UK, Italy and Poland), the indicators are not able to catch the fast variations of employment growth figures published by statistical offices. However, the trends, or underlying developments, are usually very well tracked.

The forecasting exercise showed that the BCS-based employment index is able to improve the accuracy of predictions of employment growth, with a performance slightly better than that of Markit's Composite PMI Employment Index particularly for the first monthly data release.

ANNEX TO SECTION 1

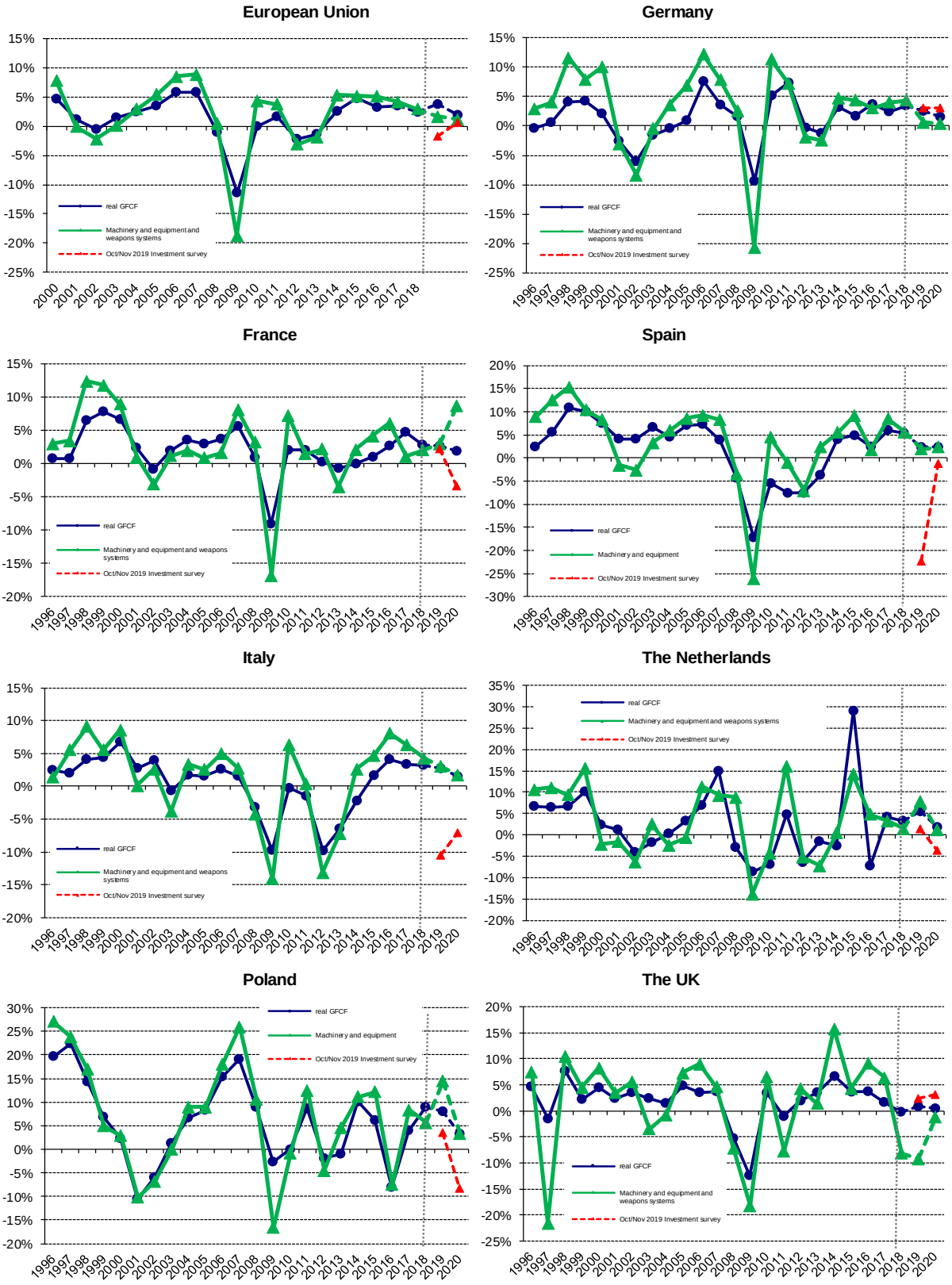
Table A.1: Inflation perceptions by socio-demographic category of respondent (in %)

	weighted mean adjusted for outliers					25% quartile					median					75% quartile				
	Average	2019				Average	2019				Average	2019				Average	2019			
	2004-2019	Q1	Q2	Q3	Q4	2004-2019	Q1	Q2	Q3	Q4	2004-2019	Q1	Q2	Q3	Q4	2004-2019	Q1	Q2	Q3	Q4
	Total																			
EU	9.2	7.6	8.9	8.7	8.1	3.7	2.8	3.1	3.1	2.9	6.6	5.3	5.9	6.0	5.6	11.6	9.8	11.3	10.9	10.3
EA	8.8	6.3	7.5	7.1	6.5	3.6	2.5	2.7	2.6	2.5	6.3	4.4	4.9	4.7	4.5	11.0	7.8	9.2	8.7	8.2
	Gender: Male																			
EU	7.9	6.7	7.7	7.5	6.9	3.3	2.6	2.8	2.8	2.6	5.7	4.7	5.1	5.2	4.7	9.9	8.1	9.5	9.6	8.5
EA	7.6	5.6	6.3	6.0	5.4	3.2	2.3	2.5	2.4	2.2	5.6	4.1	4.4	4.2	3.9	9.5	6.7	7.6	7.5	6.6
	Gender: Female																			
EU	10.5	8.7	10.3	10.0	9.6	4.2	3.0	3.5	3.5	3.3	7.6	5.7	6.8	6.8	6.7	13.5	11.2	13.1	12.7	12.4
EA	9.8	7.3	8.9	8.3	7.8	4.0	2.8	3.1	2.8	2.8	7.0	4.7	5.7	5.4	5.4	12.3	9.0	11.2	10.7	10.0
	Age: 16 to 29																			
EU	9.8	9.7	10.6	10.0	9.7	3.9	3.7	3.8	3.6	3.8	7.3	7.5	8.1	7.5	6.9	12.9	12.8	14.7	13.3	13.0
EA	9.2	7.7	8.3	7.4	7.1	3.9	2.9	3.0	2.7	2.8	6.9	5.9	5.9	5.3	4.7	12.1	9.5	11.6	9.9	9.3
	Age: 30 to 49																			
EU	9.4	8.2	9.6	9.4	8.6	3.8	3.0	3.2	3.5	2.9	6.8	5.5	6.3	6.5	5.8	11.9	10.9	12.1	12.1	10.9
EA	9.0	6.6	7.9	7.3	6.7	3.7	2.7	2.8	2.7	2.5	6.5	4.5	5.2	4.8	4.5	11.3	8.6	9.7	9.0	8.3
	Age: 50 to 64																			
EU	8.9	6.9	8.3	8.0	7.4	3.7	2.8	3.1	3.2	2.8	6.4	4.7	5.7	5.6	5.1	11.1	8.7	10.6	9.9	9.5
EA	8.5	6.1	7.3	6.9	6.2	3.6	2.6	2.7	2.6	2.4	6.1	4.3	5.0	4.8	4.3	10.7	7.6	9.3	8.7	8.0
	Age: 65+																			
EU	8.8	6.3	7.1	7.1	6.8	3.8	2.8	3.0	2.9	3.0	6.4	4.5	5.0	5.0	4.9	10.9	7.5	8.7	8.7	8.1
EA	8.3	5.7	6.3	6.3	5.9	3.6	2.5	2.6	2.6	2.5	6.0	4.0	4.5	4.4	4.3	10.2	6.8	7.7	8.0	7.1
	Income: 1st quartile																			
EU	11.5	10.3	11.2	11.3	10.7	4.4	3.6	4.1	3.9	3.6	8.2	7.1	7.7	7.8	7.1	15.0	13.6	14.7	14.6	13.9
EA	11.0	8.9	10.0	9.6	9.3	4.4	3.3	3.6	3.2	3.3	7.8	6.1	6.9	6.4	6.0	14.1	11.8	13.1	12.1	11.8
	Income: 2nd quartile																			
EU	9.6	8.0	9.8	9.4	8.5	3.9	2.8	3.7	3.5	3.3	7.0	5.5	6.5	6.2	6.0	12.3	10.2	12.2	11.3	10.5
EA	9.2	6.7	8.4	8.2	6.8	3.9	2.8	3.1	3.1	2.6	6.7	4.6	5.5	5.3	5.0	11.7	8.3	10.5	9.6	8.1
	Income: 3rd quartile																			
EU	8.6	7.3	8.5	8.2	8.0	3.6	2.9	3.1	3.4	3.1	6.3	5.3	5.8	5.8	5.5	10.9	9.4	10.2	10.5	9.9
EA	8.2	5.8	7.1	6.6	6.1	3.5	2.5	2.6	2.7	2.5	6.0	4.3	4.9	4.6	4.4	10.3	7.2	8.3	8.5	7.5
	Income: 4th quartile																			
EU	7.2	6.0	7.1	7.1	6.4	3.1	2.6	2.8	2.7	2.6	5.4	4.4	4.9	5.0	4.6	9.2	7.7	9.3	9.0	8.4
EA	6.9	4.7	5.4	5.1	4.8	3.0	2.1	2.2	2.1	2.0	5.1	3.5	3.9	3.6	3.5	8.6	5.9	6.9	6.4	6.2
	Education: Primary																			
EU	11.0	10.2	12.6	12.1	10.9	4.3	3.7	4.3	4.1	3.6	7.9	7.6	9.1	8.0	7.9	14.5	13.5	17.1	17.2	14.2
EA	10.0	7.5	9.4	9.1	8.1	4.1	3.0	2.9	3.3	2.7	7.1	4.9	5.8	5.8	5.1	12.7	9.3	11.7	12.2	9.9
	Education: Secondary																			
EU	9.3	8.1	9.4	9.0	8.8	3.8	2.8	3.3	3.2	3.0	6.7	5.5	6.3	6.3	5.8	11.9	10.7	11.8	11.2	10.9
EA	8.8	7.0	8.0	7.6	7.0	3.6	2.7	2.9	2.7	2.6	6.3	4.6	5.4	5.2	4.9	11.1	9.1	10.1	9.3	8.5
	Education: Further																			
EU	7.5	6.6	7.4	7.5	6.8	3.2	2.7	2.8	2.9	2.5	5.5	4.7	5.2	5.2	4.7	9.6	8.6	9.6	9.5	8.8
EA	7.0	5.1	5.9	5.6	5.0	3.0	2.3	2.4	2.3	2.1	5.2	3.7	4.1	3.8	3.5	8.9	6.6	7.2	6.9	6.4

Table A.2: Inflation expectations by socio-demographic category of respondent (in %)

	weighted mean adjusted for outliers					25% quartile					median					75% quartile				
	Average	2019				Average	2019				Average	2019				Average	2019			
	2004-2019	Q1	Q2	Q3	Q4	2004-2019	Q1	Q2	Q3	Q4	2004-2019	Q1	Q2	Q3	Q4	2004-2019	Q1	Q2	Q3	Q4
	Total																			
EU	6.6	6.8	7.8	8.0	7.8	2.4	2.2	2.4	2.5	2.4	4.4	4.4	5.0	5.0	5.1	8.2	8.4	9.9	10.3	9.6
EA	5.7	4.7	5.8	5.5	5.5	2.0	1.6	1.8	1.7	1.8	3.8	2.9	3.5	3.2	3.6	6.9	5.3	6.8	6.6	6.5
	Gender: Male																			
EU	5.8	6.1	6.9	7.0	6.7	2.2	2.1	2.2	2.3	2.2	3.9	3.8	4.1	4.1	4.1	7.1	6.9	8.0	8.2	7.6
EA	5.1	4.2	5.1	4.9	4.8	1.9	1.5	1.6	1.5	1.6	3.4	2.7	3.1	2.9	3.0	6.1	4.8	5.6	5.5	5.4
	Gender: Female																			
EU	7.5	7.7	9.0	9.2	9.1	2.7	2.5	2.8	2.9	2.8	5.1	5.3	5.9	6.0	6.1	9.6	9.7	11.6	12.3	12.4
EA	6.4	5.2	6.7	6.4	6.6	2.2	1.8	2.0	1.8	2.0	4.3	3.4	4.2	4.1	4.3	8.0	6.2	8.2	8.2	8.7
	Age: 16 to 29																			
EU	7.2	8.4	9.6	9.8	9.6	2.5	3.0	3.1	3.2	3.2	5.1	6.4	6.8	6.8	7.5	9.5	11.6	12.8	13.1	13.3
EA	6.0	5.0	6.3	6.1	6.2	2.1	1.7	1.6	1.8	1.9	4.2	3.8	4.1	4.0	4.5	7.8	6.4	7.6	7.8	8.8
	Age: 30 to 49																			
EU	6.8	7.6	8.7	8.8	8.4	2.4	2.5	2.6	2.7	2.6	4.6	5.1	5.8	5.7	5.5	8.5	9.9	11.6	11.7	10.9
EA	5.8	5.0	6.2	5.7	5.9	2.0	1.6	1.9	1.6	1.8	3.9	3.2	4.0	3.4	3.6	7.3	5.9	7.6	7.3	7.4
	Age: 50 to 64																			
EU	6.4	6.1	7.1	7.2	7.2	2.4	2.1	2.4	2.5	2.5	4.4	3.9	4.3	4.6	4.6	7.9	7.2	8.6	8.3	8.5
EA	5.6	4.5	5.6	5.5	5.4	2.1	1.7	1.8	1.8	1.8	3.8	2.8	3.3	3.4	3.4	6.8	5.3	6.6	6.2	6.5
	Age: 65+																			
EU	6.1	5.3	5.9	6.1	6.1	2.5	2.2	2.4	2.4	2.4	4.3	3.6	4.1	4.1	4.0	7.5	6.4	7.1	7.3	7.1
EA	5.2	4.2	4.8	4.7	4.8	2.1	1.7	1.8	1.7	1.8	3.6	2.8	3.2	3.0	3.2	6.3	5.0	5.6	5.6	5.7
	Income: 1st quartile																			
EU	8.2	8.7	9.8	10.2	10.2	2.8	2.7	3.2	2.9	3.2	5.6	5.5	6.4	6.6	6.7	10.7	11.6	13.2	13.3	13.6
EA	7.0	6.1	7.5	7.5	7.9	2.4	1.8	2.3	2.0	2.5	4.7	3.7	4.6	4.6	5.0	8.9	8.0	10.0	9.7	10.2
	Income: 2nd quartile																			
EU	6.9	7.4	8.5	8.4	8.3	2.6	2.4	2.8	2.8	2.6	4.8	4.7	5.5	5.5	5.4	8.8	9.3	11.4	11.1	10.4
EA	5.9	5.0	6.3	6.3	5.9	2.2	1.7	1.8	2.0	2.0	4.1	3.2	4.0	3.8	3.9	7.5	6.0	8.0	8.2	7.2
	Income: 3rd quartile																			
EU	6.2	6.6	7.5	7.7	7.5	2.4	2.2	2.5	2.7	2.6	4.3	4.2	4.7	4.9	5.1	7.8	8.5	9.5	9.7	9.3
EA	5.4	4.4	5.6	5.3	5.0	2.0	1.7	1.8	1.8	1.8	3.7	3.0	3.5	3.3	3.4	6.7	5.2	6.7	6.8	6.0
	Income: 4th quartile																			
EU	5.4	5.5	6.4	6.8	6.4	2.1	2.1	2.3	2.3	2.3	3.7	3.8	4.0	4.1	4.1	6.8	7.0	7.6	8.7	7.6
EA	4.6	3.5	4.4	4.1	4.2	1.8	1.5	1.7	1.5	1.6	3.2	2.5	2.9	2.5	2.8	5.6	4.3	5.1	4.9	5.0
	Education: Primary																			
EU	8.0	8.7	11.1	11.4	10.5	2.8	2.8	3.5	3.4	2.7	5.5	5.9	7.6	8.0	7.8	10.5	11.1	15.9	16.0	15.3
EA	6.4	4.9	7.2	7.4	7.1	2.2	1.6	2.0	2.4	2.1	4.3	3.1	4.2	4.3	5.5	8.0	5.7	9.5	9.7	9.5
	Education: Secondary																			
EU	6.8	7.1	8.1	8.1	8.1	2.4	2.2	2.7	2.5	2.5	4.6	4.6	5.3	4.9	5.4	8.5	8.8	10.4	10.5	10.6
EA	5.8	5.2	6.3	5.9	5.9	2.0	1.7	2.0	1.8	1.9	3.9	3.2	4.0	3.6	3.9	7.1	6.3	7.6	7.0	7.5
	Education: Further																			
EU	5.7	6.3	6.9	7.2	6.8	2.2	2.2	2.3	2.5	2.2	3.9	4.2	4.3	4.7	4.4	7.0	7.5	8.4	9.0	8.2
EA	4.8	4.1	4.8	4.4	4.5	1.9	1.6	1.6	1.7	1.6	3.3	2.7	3.0	2.8	2.9	5.9	4.7	5.5	5.3	5.3

ANNEX TO SECTION 2



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 here.
Long time series (ESI and confidence indices) are available here.

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 except prices; 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.

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