QUARTERLY REPORT ON THE EURO AREA

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- Recent economic developments and short-term prospects
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EUROPEAN COMMISSION
DIRECTORATE-GENERAL FOR ECONOMIC AND FINANCIAL AFFAIRS

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EDITORIAL

Economic growth in the euro area is now gathering momentum, after moderating in the first half of the year. Estimates for the third quarter indicate that GDP growth is above potential, and leading indicators point to continued solid growth in the months to come.

External trade continues to be an important driver of growth in the euro area. Exports in the third quarter expanded at the fastest pace since the end of 2000, reflecting buoyant world trade and competitiveness gains following the depreciation of the euro since the beginning of 2005.

There are now also signs that domestic demand is at last strengthening, with a marked recovery in business confidence contributing to a strong acceleration in investment growth. The pick-up in private consumption has been more gradual, reflecting the effect of higher oil prices on disposable income and subdued consumer confidence. Overall, the risks to the short-term growth outlook appear more balanced than three months ago.

Substantial and lasting increases in oil prices over the last two years have given rise to concerns about rising inflation. One of the focus sections of this report shows that higher oil prices have indeed had a significant direct effect on the energy component of the HICP since the beginning of the year.

Indirect effects of higher oil prices, which occur when producers pass through higher input costs into their final prices, have been slow to materialise but are beginning to be felt and could exert significant upward pressures on inflation in the euro area in the year to come. However, the impact on overall inflation has been limited due to the lagged effect of past exchange-rate appreciation and moderate growth in unit labour costs.

Second-round effects, meanwhile, which depend on the response of wage bargainers and price setters, have been muted. However, there is a low, but not insignificant risk, that they could be higher in Member States where labour market conditions are tight or where there are wage-indexation schemes.

Looking ahead to the medium term, the euro area faces two major challenges. The first will be to allay widespread concerns over the perceived negative consequences of globalisation. One recurring concern, for example, is that increased import competition from low-wage countries puts too much pressure on European producers and workers and may result in factories being closed at home and economic activities being located abroad.

However, a recent study by the European Commission, published in the EU Economy Annual Review 2005, suggests that many preconceptions about globalisation are ill-founded.

Firstly, it finds that about one fifth of the increase in living standards in the EU-15 over the past 50 years can be attributed to Europe's progressive integration with the world economy.

Secondly, international trade and investment have not historically been associated with aggregate net employment losses at home, and there is also no indication that more open economies suffer from higher unemployment.

Thirdly, deeper international integration does not appear to systematically exert downward pressure on the wage share in national income. Nor, despite some high-profile cases, has globalisation led to a systematic erosion of working conditions.

Fourthly, the outsourcing of business services has largely been matched by rising

exports. In fact, the EU has a healthy overall trade surplus in business-related services, equivalent to ½% of GDP in 2003.

Nevertheless, public concerns over globalisation should not be dismissed too readily. In order to realise the full gains from globalisation and protect Europe's share of world markets it will be crucial for the EU not only to consolidate its position in the medium-high-technology sectors but also to improve its position in a wider range of high-technology market segments – and the structural transformation process that this will entail could hit some people in certain sectors or regions hard.

What is needed to facilitate the transformation process is an effective adjustment of the labour market – but high levels of long-term unemployment and relatively low labour mobility in many Member States indicate that the process is not running smoothly enough. One new initiative that, along with the structural funds and the European Social Fund, could help reduce the costs of change and facilitate transition is the Globalisation Adjustment Fund proposed by President Barroso at October's Informal European Council at Hampton Court and endorsed by the European Council in December.

But any strategy designed to make globalisation a win-win situation must include not just responsive labour markets and a well-trained and highly skilled workforce, but also a stable macroeconomic environment, efficient and integrated financial markets, an open and dynamic internal market including a genuine single market in services, improved access to third countries' markets and an open multilateral trading system, underpinned by strong multilateral trade rules. The recent Hong Kong WTO Ministerial meeting provides a strong basis for moving forward with the current round of multilateral trade negotiations, the Doha Development Agenda (DDA). An ambitious DDA outcome will be integral to improving prospects for global growth and poverty reduction. By including fast-growth sectors such as the service sector, this round has the potential to deliver even wider and deeper economic benefits to its participants.

The second major issue on the euro-area's medium-term agenda, and also discussed in the other focus section of this report, is how to meet the economic challenges posed by an ageing population. The number of people in the euro area aged 65 years and above relative to those aged between 15 and 64 will have doubled by 2050. This means that the euro area will go from the current situation of four people of working-age for every elderly citizen to a ratio of two to one. Economically, this will result in a falling labour supply, lower growth in living standards and rising taxation and age-related expenditure – unless policies change.

The good news is that policies are gradually beginning to change. In particular, the labour market reforms promoted by the Lisbon Strategy are contributing to rising employment rates by curtailing access to early retirement schemes, making work pay, raising statutory retirement ages and strengthening financial incentives in pension systems to delay retirement.

However, we cannot rest on our laurels. Even if the euro area as a whole achieves the Lisbon employment targets (which in any case it will not do until after the original target date of 2010), this will not be sufficient to offset the economic effects of demographic change. Therefore, it will be necessary to develop a more ambitious set of labour-market and welfare-state policies that are sustainable in the face of uncertain economic and demographic developments.

Longer life expectancy may pave the way for a possible expansion of the share of life spent in retirement. However, retirement decisions also need to be economically and financially viable. Flexible retirement ages adapting to a continuously increasing life expectancy may be the appropriate policy response.

Klaus REGLING
DIRECTOR GENERAL

I. Economic situation in the euro area

Economic activity is gaining momentum in the euro area. GDP growth accelerated to rates above potential in the third quarter, and leading indicators point to continued solid growth in the last months of 2005 and the beginning of 2006. Although private consumption is improving only very gradually, domestic demand is at last showing signs of strengthening on the back of a recovery in investment. External trade remains a key engine of growth as euro-area exporters benefit from a pick-up in world trade and in competitiveness gains resulting from the depreciation of the euro since the beginning of the year. Overall, risks to the short-tem outlook appear more balanced than three months ago.

Continued favourable monetary and financial conditions are an important source of support to activity in the euro area at the current juncture. In particular, despite a recent increase, long-term interest rates in the euro area are extremely low compared with their levels over the past two decades. This reflects a combination of global and euro-area specific factors. Global factors that have weighed on interest rates in the USA as well as in the euro area include enhanced central bank credibility in constraining inflation, the existence of excess liquidity in the international financial system, the purchases of US Treasury bills by Asian central banks, underinvestment in the corporate sector and shifts in the investment strategies of pension funds due to population ageing. In addition, sluggish short-term growth prospects and downward revisions in potential growth have also contributed to lower yields in the euro area in recent years.

1. Recent economic developments and short-term prospects [1]

Domestic demand picking up

The national-account estimates for the third quarter indicate that the recovery in the euro area is gaining momentum. After some moderation of economic activity in the first half of the year, GDP growth accelerated to 0.6% quarter-on-quarter in the third quarter, which is both above potential and in line with the Commission's autumn 2005 forecast. Higher GDP growth was supported by an acceleration of growth in domestic demand (excluding inventories). The progressive acceleration in the rate of growth of domestic demand over the first three quarters of this year represents an important step towards a more balanced recovery in the euro area. The strong pick-up in demand in the industrial sector led to a sizeable depletion of inventories, which translated into the strongest negative contribution since the start of the current recovery. On the other hand, foreign demand made a positive contribution to growth, as exports picked up strongly.

Among the larger euro-area Member States, Germany and France experienced particularly healthy growth rates of 0.6% and 0.7%, respectively, a clear improvement on the previous quarter. Economic activity in Spain sustained a robust pace of 0.8%. In contrast, following a stronger-than-expected pick-up in the second quarter of the year, GDP growth in Italy and the Netherlands remained more subdued (0.3%). Overall, notwithstanding the differences in growth rates across countries, the acceleration of economic activity was more broad-based in the third than in the second quarter.

An examination of the main demand components reveals that, excluding inventories, domestic demand provided the main support to GDP growth in the euro area (0.6 pp). This was largely due to a significant pick-up in investment, which recorded its strongest increase in the last five years (1.6%) and contributed 0.3 pp to GDP growth. On the other hand, the performance of private consumption improved only marginally, adding 0.2 pp to GDP growth, while the contribution of public consumption remained unchanged at 0.1 pp. Economic activity was also stimulated by external trade. While net trade provided a slightly negative contribution to economic activity in the second quarter, it added 0.3 pp to quarter-on-quarter GDP growth in the third quarter.

[1] The cut-off date for the statistics included in this issue was 13 December.

Table 1: **Euro-area growth components**

	2004 Q4	2005 Q1	2005 Q2	2005 Q3	Carryover to 2005	Forecast (1)	
						2005 (2)	2006 (2)
Percentage change on previous period, volumes							
GDP	0.2	0.3	0.4	0.6	1.3	1.3	1.9
Private consumption	0.8	0.1	0.2	0.3	1.2	1.4	1.4
Government consumption	-0.1	0.3	0.6	0.6	1.2	1.3	2.0
Gross fixed capital formation	0.6	0.1	0.8	1.6	2.2	1.7	3.1
Changes in inventories (% of GDP)	0.4	0.4	0.4	0.1	0.0	0.5	0.5
Exports of goods and services	0.3	-0.8	2.2	3.4	4.0	3.4	5.0
Imports of goods and services	1.4	-1.5	2.6	2.8	4.4	3.9	5.0
Percentage point contribution to change in GDP							
Private consumption	0.5	0.1	0.1	0.2	0.7	0.8	0.8
Government consumption	0.0	0.1	0.1	0.1	0.2	0.2	0.4
Gross fixed capital formation	0.1	0.0	0.2	0.3	0.5	0.3	0.6
Changes in inventories	0.0	-0.1	0.1	-0.3	0.0	0.1	0.0
Net exports	-0.4	0.2	-0.1	0.3	-0.1	-0.1	0.1

(1) Annual change in %. (2) European Commission Autumn 2005 Forecasts.
Source: Commission services.

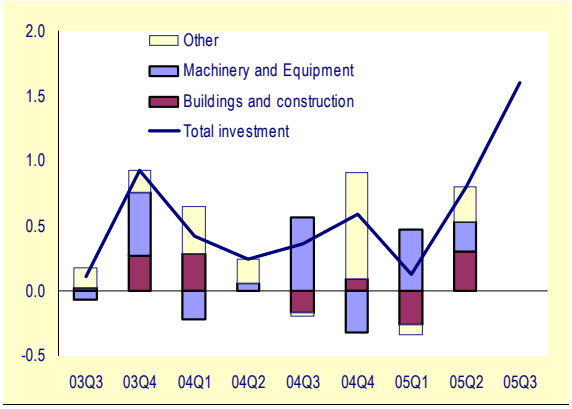
Sustained acceleration in investment

In view of the sharp pick-up in business sector confidence since the middle of the year, the strong acceleration in investment growth in the third quarter was not surprising. The fact that gross fixed capital formation in each of the previous three quarters was also revised upwards confirms the underlying momentum of the revival in investment.

The main factors supporting investment growth include improved corporate profitability and balance sheets and benign financing conditions. These elements, together with the depreciation of the euro exchange rate since the beginning of 2005, have put the corporate sector in a strong position to take advantage of the ongoing global industrial recovery. Furthermore, following several years of negative investment growth, there is also an increasing need for replacement investment in the euro area.

Data available in some Member States suggest that equipment investment was the main driving force behind the observed acceleration in the pace of gross fixed capital formation in the third quarter.[2] This is especially evident in Germany, where equipment investment grew by 3.8% quarter-on-quarter. In Spain, where sustained investment growth had been supported by a construction boom, equipment investment growth surged in the third quarter by 6.2% compared with the previous quarter, while construction investment took a pause. Investment in equipment was also a factor in the rebound of investment in France in the third quarter.

Graph 1: **Investment growth, euro area** (1)
(q-o-q change in % – 2003Q3 to 2005Q3)



(1) No breakdown available for 2005Q3.
Source: Commission services.

Although the general level of capacity utilisation in manufacturing is still below its long-term average, the strength of the global recovery in the manufacturing sector should underpin investment spending, which is projected in the Commission's autumn forecast to be the main impulse behind the expected sustained recovery of euro-area domestic demand in 2006.

[2] Data on the composition of investment for the euro area as a whole are not yet available for the third quarter.

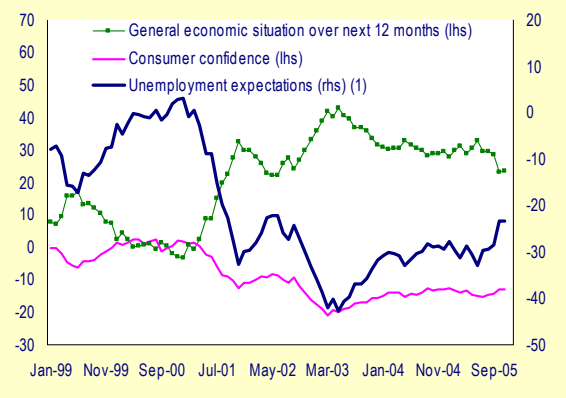
Table 2: **Selected euro-area and national leading indicators, 2004-2005**

	SENT. IND[1)]	BCI[2)]	OECD[3)]	PMI Man.[4)]	PMI Ser [5)]	IFO[6)]	NBB[7)]	ZEW[8)]
Long-term average	100.9	0.00	2.83	52.1	54.3	95.6	-9.5	30.5
Trough in latest downturn	88.1	-1.25	-0.77	42.9	46.7	87.3	-26.5	-10.4
December 2004	99.6	0.40	1.34	51.4	52.7	96.4	-5.3	14.4
January 2005	100.5	0.40	1.16	51.9	53.4	97.5	-5.0	26.9
February 2005	98.5	0.20	0.78	51.9	53.0	96.3	-11.4	35.9
March 2005	97.1	-0.10	0.24	50.4	53.0	94.6	-9.4	36.3
April 2005	96.1	-0.30	-0.27	49.2	52.8	93.6	-15.9	20.1
May 2005	96.1	-0.40	-0.47	48.7	53.5	92.4	-14.0	13.9
June 2005	96.1	-0.30	-0.20	49.9	53.1	93.0	-14.3	19.5
July 2005	97.3	-0.10	0.56	50.8	53.5	95.1	-13.8	37.0
August 2005	97.6	-0.10	1.55	50.4	53.4	95.5	-14.1	50.0
September 2005	98.4	0.10	2.40	51.7	54.7	95.5	-7.0	38.6
October 2005	100.2	0.20		52.7	54.9	98.6	-6.0	39.4
November 2005	99.9	0.10		52.8	55.2	97.7	-5.6	38.7
December 2005								61.6

1) Economic sentiment indicator, DG ECFIN. 2) Business climate indicator, DG ECFIN. 3) Composite leading indicator, six monthly change. 4) Reuters Purchasing Managers Index, manufacturing. 5) Reuters Purchasing Manager Index, services. 6) Business expectations, West Germany. 7) National Bank of Belgium indicator for manufacturing. 8) Business expectations of financial market analysts, Germany.

The positive outlook for investment is not confined to the equipment sector. The confidence indicator for the construction sector has improved noticeably since the summer. It registered a particularly strong increase in November, which brought its level significantly above its long-term average. The November increase was spearheaded by a marked strengthening of confidence in Spain, but the improvement in construction sector confidence was shared across most Member States. In particular, confidence in the German construction sector, which was on a chronic downward trend for a number of years, has improved significantly since the beginning of the year, and is now around its long-term average.

Graph 2: **Household confidence, the euro area**
(balance in %)



(1) Inverted scale.
Source: Commission services.

Gradual improvement in consumption

Following a rebound in the last quarter of 2004, private consumption growth slowed markedly during the first half of 2005 in the euro area. It grew by 0.1% in the first quarter and by 0.2% in the following quarter. It then accelerated slightly to 0.3% in the third quarter, but remains subdued. Factors behind its lacklustre performance include a still restrained level of consumer confidence and the pressure on household purchasing power caused by the rise in headline inflation (which picked up from 1.9% in January to 2.6% in September and was still at 2.4% in November).

In a number of countries, indicators of consumer confidence suggest that households remain rather cautious in their spending. Despite some improvement in recent months, consumer confidence is still at the level observed at the beginning of the year and remains below its long-term average. This suggests that consumption by private households should not be expected to provide a strong boost to the economy in the near term. Consumers' expectations of unemployment have improved since the summer, against the background of a decelerating but still high unemployment rate (at 8.3% in November). However, consumers'

expectations concerning the economic situation over the next 12 months and, to a lesser extent, their financial situation have deteriorated since the middle of the year. Other indicators for household spending also suggest subdued consumption growth. Confidence in the retail trade sector has improved since the summer, but the November data were disappointing. The three-month moving average for the volume of retail sales in the euro area rose by a marginal 0.1% in August-October over the previous three-month period.

On a more positive side, the outlook for private consumption should gradually benefit from more dynamic job creation and falling unemployment. Business surveys have shown a noticeable improvement in companies' employment expectations in the service sector since the summer. More recently, reported employment prospects have also increased slightly in the manufacturing sector. According to the Commission's autumn 2005 economic forecasts, employment is expected to increase by 1% this year and by 1.2% in 2006 as growth regains momentum. The unemployment rate is expected to fall further from an estimated 8.6% in 2005 to 8.4% in 2006. Sustained employment growth will boost real disposable income, the moderate growth of which (around 1% in annual terms over the past few years) has been the main factor behind the relative weakness of private consumption in this cycle.

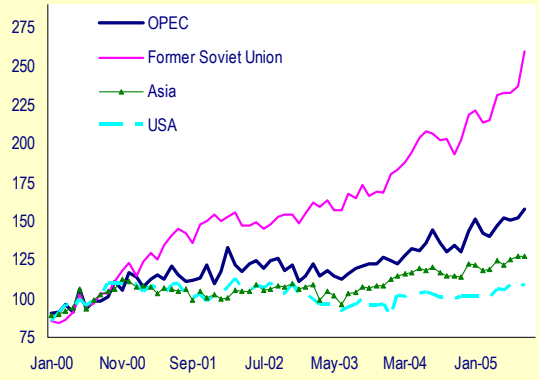
In addition, it is worth noting that the household saving rate interrupted its downward trend at the beginning of this decade and, after two years of increase in 2001-02, has remained broadly stable. These developments in the saving rate have further dampened consumption growth in the past few years. A number of factors may have led households to increase savings, including higher uncertainty due, inter alia, to geopolitical tensions, lack of clarity about the timing and scale of some structural reforms, and/or the lingering effects of past exceptional losses in equity holdings.[3] While the saving rate of households in the euro area is projected to decline slightly over the forecast horizon (from 14.4% in 2005 to 14.2% in 2007), this will not be sufficient to reverse the rise observed in 2001-2002.

[3] See 'Consumption, Investment and Saving in the EU: an assessment', DG ECFIN Occasional Paper No. 20, November 2005.

Robust export growth

Moving on to the external sector, exports expanded in the third quarter at the fastest pace since the fourth quarter of 2000. This evolution was supported by a depreciation of the exchange rate of the euro vis-à-vis the main trading partners of the euro-area countries (nominal effective exchange rate) and continued strong growth in world trade. Since the high point reached at the turn of the year (which coincided with its peak against the USD), the nominal effective exchange rate of the euro has fallen by around 6% against the currencies of the main trading partners. In line with the lagged relationship between the exchange rate and exports, this depreciation should continue to boost exports over the coming quarters.

Graph 3: **Euro-area exports by destination**
(Index of values in euro, sa, 2000=100, Jan 2000 to Aug 2005)



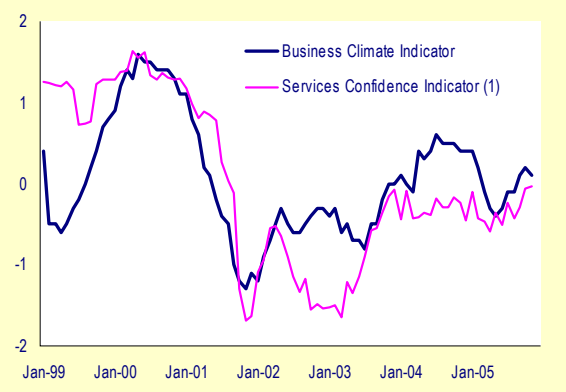
Source: Commission services.

The global environment has also provided support for exports. After the stagnation of the first quarter and the buoyancy of the second quarter, world trade grew at trend (an annualised rate of about 7%) in the third quarter, according to the latest CPB release. In addition, euro-area exports were probably boosted by the recycling of oil revenues, which was facilitated by the close trading links with oil-exporting countries, particularly countries from the former Soviet Union (see Graph 3).

Business indicators point to solid growth in the fourth quarter

Short-term indicators for the business sector suggest that euro-area manufacturing activity has remained resilient in the fourth quarter, supported by a weaker euro, stabilising oil prices, persistently strong global demand and a revival of domestic demand. According to the European Commission survey, industrial confidence is currently above the level observed in the third quarter. As a result of its improvement between June and October, the Business Climate Indicator remains above its long-term average despite a slight decrease in November. Production expectations in the manufacturing sector have also strengthened further in the past few months. Reuters PMI for the euro-area manufacturing sector rose to 52.8 in November, the highest level since September 2004 and well above the threshold which separates expansion from contraction of manufacturing activity. The IFO index – which measures economic activity conditions in Germany – was weaker than expected in November, probably influenced by the proposed rise in VAT. Despite the correction, the index remains above the average of the previous quarter and is consistent with healthy GDP growth.

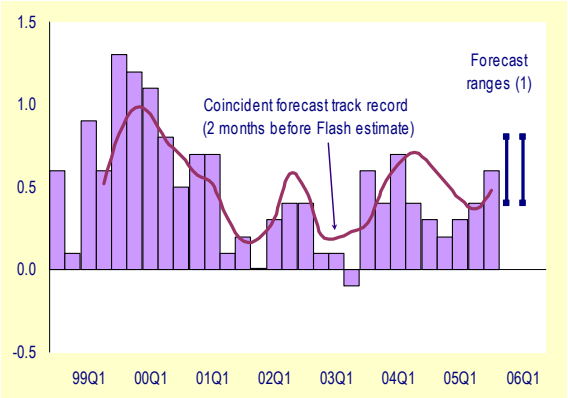
Graph 4: **Business confidence indicators, euro area** (Jan 1999 to Nov 2005)



(1) Normalised.
Source: Commission services.

Recent service sector indicators support the view that the euro-area recovery is gaining momentum. After a decline in the first quarter of this year, the European Commission confidence indicator for services has increased since April approaching its long-term average. Sentiment in service sectors has been bolstered by an improving current business situation and, to a lesser degree, better demand expectations. The Reuters index for services continued to increase in October/November, suggesting continued expansion in the service sector in the fourth quarter.

Graph 5: **The short-term outlook for euro-area GDP growth** (q-o-q changes in % – 1999Q1 2006Q1)



(1) Confidence level 68% (+/- one standard deviation of past forecast errors).
Source: Commission services.

Looking forward, Graph 5 displays the short-term quarterly GDP growth projections for the euro area derived from DG ECFIN's short-term dynamic factor model. This new model replaces the indicator-based model shown in the previous issues of this report. It is based on a more robust statistical methodology and statistical tests indicate that it exhibits significantly better forecasting properties than its predecessor (see Box 1 for an explanation of the methodology). The short-term dynamic factor model projects GDP quarter-on-quarter growth to range between 0.4% and 0.8% both in the fourth quarter of 2005 and in the first quarter of 2006. The growth profile is underpinned by buoyant international trade data and the sustained improvement in business survey results. These predictions are slightly more optimistic than the quarterly profile in the just-released ECFIN autumn forecast.

Box 1: **A dynamic factor model for predicting quarterly euro-area GDP growth**

Until recently, the Commission services used an indicator-based model to make predictions of euro-area GDP growth for the two quarters following the latest quarterly GDP release. The indicator-based model was based on a regression equation linking euro-area GDP growth to six key indicators covering real and financial activity, such as car registrations, business confidence, the euro-area-US yield differential and the real effective exchange rate. The relationship, which was based on historical data for the variables in question, was then used to make projections of growth for two subsequent quarters. A drawback of such indicator-based models is that they do not use all economic information, which might be relevant for producing good forecasts. In addition, the forecasting power of such models may diminish over time since they are based on historical relationships, which change as economic structures evolve.

To overcome these limitations, the Commission services have decided to replace the indicator-based model by a dynamic factor model (see Grenouilleau (2004) for a technical description). The Commission's dynamic factor model makes use of a broad range of economic data available at the time when the projection is made. It distils the relevant "factors" driving the euro-area business cycle from a dataset of around two thousand time series for the euro-area countries and uses these "factors" to make projections of euro-area GDP.

Factor models provide a means of summarising the information contained in large datasets by a small number of "factors". The approach assumes macroeconomic time series have two components: a common component corresponding to the business cycle and an idiosyncratic component that is specific to each time series. It is the common component which is relevant for forecasting purposes. Various estimation procedures have been developed to extract the common factors from the underlying time series data. The estimated common factors are then used to make projections of GDP. The time series used in the current model were selected on the basis of economic judgement and are assumed to contain information about the current and/or future economic situation in the euro area. Reflecting the unavoidable uncertainty surrounding all such predictions, the projections are presented as ranges with confidence intervals rather than as point estimates.

The performance of forecast models can be tested using out-of sample experiments, which compare past GDP growth data with the values that the model would have predicted at the time. The results are shown in the table below. Clearly, the root mean square error (RMSE) is lower for the dynamic factor model than that of the previously used indicator model. This suggests that the dynamic factor model has superior forecasting accuracy. The model also performs at least as well as comparable models used by other institutions.

Forecast RMSE (a)	Dynamic factor model	Eurocoin (b)	ECFIN former GDP indicator	OECD indicator equations (c)
Coincident	0.19 to 0.21	0.22 to 0.25	0.19 to 0.35	0.21 to 0.30
One Quarter ahead	0.21 to 0.24		> 0.35	0.31 to 0.39
Two-quarter ahead	0.24 to 0.31			
Out-of-sample span (d)	25 quarters 1999Q3-2005Q3	25 quarters 1999Q3-2005Q3	12uarters 1998Q1-2000Q4	20 quarters 1998Q1-2002Q4

Notes:
(a) The RMSE differ according to the month in which quarterly forecasts are produced, hence the ranges.
(b) Based on 3-month moving averages of the monthly indicator.
(c) Combination of hard/survey indicators based on 0 to 2 months of current quarter information.
(d) Different spans are a source of bias for a direct comparison.

Reference:

Grenouilleau, D. (2004), 'A sorted leading indicators dynamic (SLID) factor model for short-run euro-area GDP forecasting', European Economy. Economics Papers. No. 219. December.
http://europa.eu.int/comm/economy_finance/publications/economic_papers/economicpapers219_en.htm

Risks to the outlook

On the domestic side, risks to the short-term outlook appear balanced.

Consumer confidence could improve by more than expected, due to better labour market conditions and a reduction of uncertainty concerning future income streams, thanks to past or ongoing structural reforms. Such a recovery in confidence could trigger a release of the accumulated pent-up demand, which could be financed through a reduction in the saving rate.

In the case of investment, positive risks arise from stronger growth of specific housing markets, stronger-than-expected external demand or higher productivity as a result of IT investments and past reforms. However, the possibility of higher oil prices, entrenched low-growth expectations and disappointing demand are negative risks.

On the external side, risks appear to be tilted to the downside.

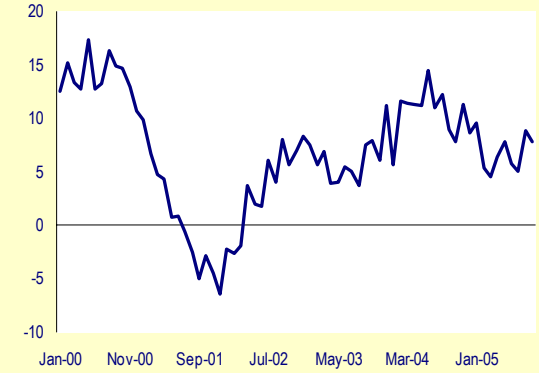
The possibility of higher and more volatile oil prices cannot be ruled out. There could be an adjustment of consumer behaviour in the USA in the light of growing uncertainties about future income and the impact of rising interest rates. And a disorderly correction of global imbalances also remains a threat to world growth. On the positive side, the euro area should continue to be well placed to benefit from any extra demand from oil-exporting countries.

Global economy is regaining momentum

After going through a period of slower growth earlier in the year, the world economy seems to have regained some momentum. Notably, world trade has picked up recently, with the year-on-year rate of increase rising from a low of 4.7% in April to an average growth rate of above 8% in August and September, the latest month for which data is available (Graph 6). Survey results reinforce the impression that the global economy is picking up steam. The fourth quarter reading of the World Economic Survey showed the first improvement of the world economic climate since the beginning of 2004, thanks to a significantly more positive assessment of the current situation. The recent improvement has been concentrated in western Europe and Asia.

Oil prices peaked at almost 70 USD/bl in early September, as a series of hurricanes caused widespread damage to oil and refinery facilities in the US Gulf region. Since then, prices have come down, as the supply situation in the Gulf has gradually normalised and incoming stock data has calmed the markets. However, the barrel of Brent was still trading only slightly below 60 USD mid-December and prices are expected to remain at an elevated level for some years to come.

Graph 6: **World trade**
(% y-o-y changes in volume, Jan 2000 to Sep 2005)



Source: CPB Netherlands Bureau of Economic Policy Analysis.

The ***US economy*** has kept a good deal of forward momentum in the autumn of 2005 despite the damage and disruption caused by recent hurricanes. Real GDP expanded at an annual rate of 4.3% in the third quarter, once more driven by vigorous growth in consumer spending. The fourth quarter is likely to register some softening in GDP growth due to the hurricane-induced disruptions to economic activity. However, recent high-frequency data do not indicate a fundamental weakening in the solid pace of expansion. Forward-looking indicators such as consumer confidence and capital goods orders recovered quickly after the hurricanes. The only sector which has shown some signs of cooling down is housing, but even here the evidence is still ambiguous. The annual GDP growth rate for 2005 is likely to be close to

3½%. Higher energy prices pushed headline inflation to 4.7% year-on-year in October, but core inflation has remained subdued at close to 2%. The labour market resumed its path of moderate gains in payrolls in November, while the unemployment rate has remained stable at around 5%. The Federal Reserve has continued to withdraw monetary policy accommodation by raising the federal funds target rate to 4.25% in December. Longer-term interest rates have also increased by about half a percentage point over the autumn months.

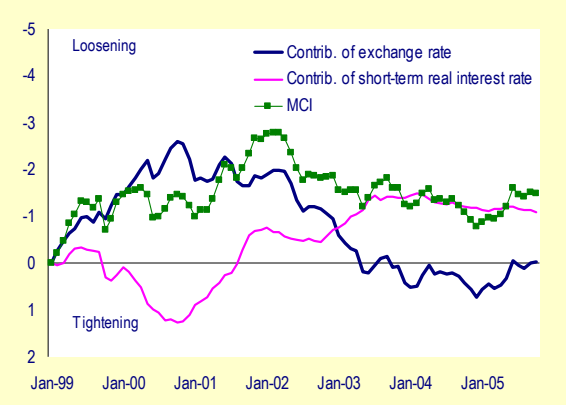
The ***Japanese economy*** seems on track for a sustained recovery, albeit at a moderate pace. In the third quarter of 2005, GDP grew by a seasonally-adjusted annual rate of 1.7%, down from 6.3% and 3.3% in the first two quarters of 2005 respectively. Growth for the full year of 2005 should reach 2.5%. Private consumption continues to increase, thanks to the marked improvement in the labour market situation, with total employment now on an upward trend and the unemployment rate standing at 4.5% in October. In the light of these developments, real wages have started to rise, albeit with some fluctuations. Thanks to high corporate profitability and significantly strengthened corporate balance sheets, non-residential investment is rising as well. On the external side, imports are continuing to accelerate in line with the upturn in domestic demand. Exports have started to pick up, mainly due to increased Chinese demand. In September, the current account surplus widened to JPY 1.86 trillion, or about €13.5 billion.

Economic growth in ***China*** is continuing apace, averaging 9.4% at an annual rate in the first three quarters of this year. The ongoing strength of the Chinese economy has made it an engine of growth for the rest of the region. Following some deceleration in external demand in early 2005, many countries in the ***rest of Asia*** are experiencing a strengthening in export growth in the second half of the year, notably with the IT sector gradually recovering, and with Chinese import demand strengthening. Growth slowed in ***Latin America*** in the first half of the year, as monetary tightening took its toll on domestic demand and slower global growth dampened external demand. With global growth picking up and monetary policy starting to ease in some countries, growth for the full year should nevertheless reach about 4% in 2005. The high price of oil should sustain growth in oil-exporting countries, such as those in the ***Commonwealth of Independent States*** and ***the Middle East,*** where growth is expected to reach about 7% and 5% respectively this year.

Monetary and financial conditions

Monetary conditions in the euro area, as measured by the Monetary Conditions Index (MCI), have remained accommodative over recent months. Movements of the MCI were mainly influenced by a further depreciation of the euro exchange rate, while real short-term interest rates remained almost unchanged.

Graph 7: **Monetary condition index, euro area**
(inverted scale – Jan 1999 to Oct 2005)



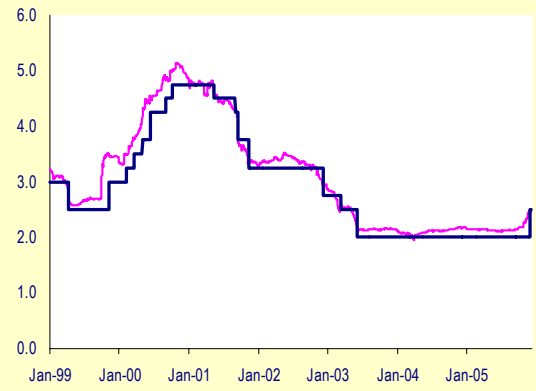
Source: Commission services.

On 1 December, the ECB increased its policy rates by 25 basis points.[4] This was the first change of policy rates since June 2003 and the first interest rate hike since October 2000. By increasing interest rates, the ECB intends to withdraw some of the accommodation embedded in the monetary policy stance, though it will remain accommodative. This move intends to keep medium- to long-term inflation expectations in the euro area solidly anchored at levels consistent with price stability.

[4] With the Monetary Conditions Index only running to October, the rise is not visible in Graph 7. At the time of completing this report, inflation data (which are necessary to calculate real interest rates) were only available to October.

The rate hike had been anticipated by financial markets. Expectations about a future rate hike had shifted significantly between October and November. While in early October, most market participants still expected an ECB rate hike only in the first half of 2006, a 25 basis points rate hike was completely priced in shortly before the ECB's meeting on 1 December. Most market participants anticipate only a moderate increase of interest rates, pricing in another two 25 basis points hikes in 2006.

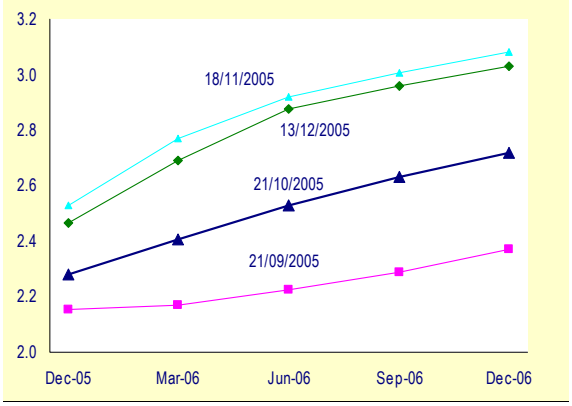
Graph 8: **ECB minimum bid rate and 3-months interbank rate** (1 Jan 99 to 13 Dec 05)



Source: ECB.

In the USA, the Fed continued its sequence of interest rates hikes and increased its policy rates by another two interest rate hikes of 25 basis points each on 1 November and 13 December respectively, bringing the target for the federal funds rate to 4.25%. At their November meeting, Federal Reserve policy makers decided that the economy had essentially shrugged off the impact of the hurricanes, leaving higher inflation as the biggest threat to the outlook. At the same time, some began for the first time to express worries that the Fed might go too far in its tightening cycle. The statement issued in connection with the rate hike on 13 December suggests that the Fed is approaching the end of the current tightening phase. However, financial markets expect a further rate increase for late January. One thing that did not affect market expectations was the announcement in October that Ben Bernanke would succeed Alan Greenspan as Federal Reserve chairman from 1 February 2006; indeed his appointment was well received and seen as a continuation of current monetary policy.

Graph 9: **3-months Euribor future implied rates (LIFE)** (in %)

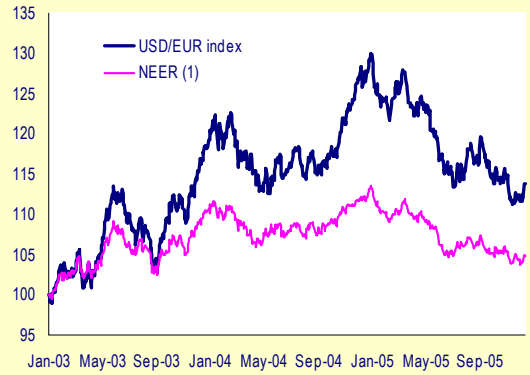


Source: EcoWin.

There have been some downward pressures on European bond prices in the last two months. Led by the short end of the market, European bond yields rose from their historical lows as markets recognised the improvement visible in growth prospects and started to anticipate an interest rate hike by the ECB. 10-year-government bond yields in the euro area have gained more than 20 basis points since the beginning of October, increasing from 3.19% to 3.40% on 13 December. At the same time, US bond yields increased only slightly from 4.39% at the beginning of October to 4.52% on 13 December, reducing the yield differential between US and euro-area government bonds from around 120 basis points to around 110 basis points.

Stock markets in the euro area first dropped in October in the wake of a shift in money market expectations but have rebounded since the beginning of November to reach their highest level since May 2002. Strong actual and expected corporate profit growth, a weaker euro and the decline in oil prices were the driving forces behind the recent gains.

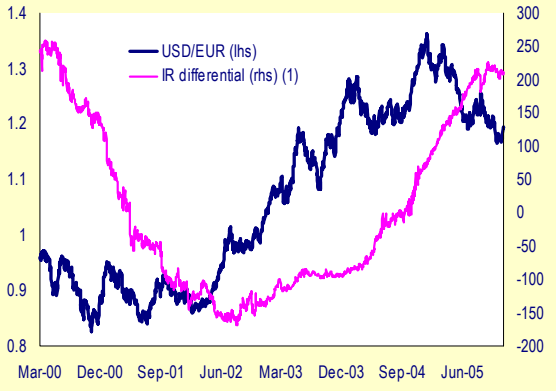
Graph 10: **Exchange rate developments, euro area** (1 Jan 1999=100 – 1 Jan 1999 to 13 Dec 2005)



(1) Against 29 countries – double export weight.
Source: EcoWin and Commission services.

Following a short-lived appreciation after the summer, the euro exchange rate remained on a downward trend. The euro lost another 2.5% against the US dollar between the beginning of October and the beginning of December (bringing the dollar-euro exchange rate to its lowest level since November 2003) before strengthening slightly again. Since its record high of 1.36 USD/euro at the end of 2004, the euro has lost some 14% against the US dollar. In nominal effective terms, the euro has lost only 6% against 29 other countries. The main theme in the dollar-euro segment of foreign exchange markets continues to be expected interest rate differentials (see Graph 11).

Graph 11: **Interest rate differential between the euro area and the USA** (6 Mar 2000 to 13 Dec 2005)



(1) Three-month forward interest rate in the USA minus three-month forward interest rate in the euro area.
Source: EcoWin.

2. A bond yield conundrum in the euro area?

A remarkable feature of global macro-financial conditions in recent years has been a sustained decline in long-term interest rates to historically low levels. This trend has been particularly pronounced in the euro area, where the benchmark 10-year bond yield (German bund) dropped further from 4.4% in June 2004 to 3% in September 2005. In the same period, the corresponding US yield fell from 4.8% to slightly above 4%.

Alan Greenspan's famous 'conundrum' description at the beginning of the year has been echoed by many market participants.[5] In the USA, the conundrum discussion seems relevant, as US yields have unexpectedly responded to the monetary policy tightening by the US Fed with a flattening yield curve, while in the past, tightening cycles have exerted upward pressure on long-term rates. The question remains whether the present level of long-term interest rates is also an unsolvable puzzle in the euro area.

Historically low level of bond yields

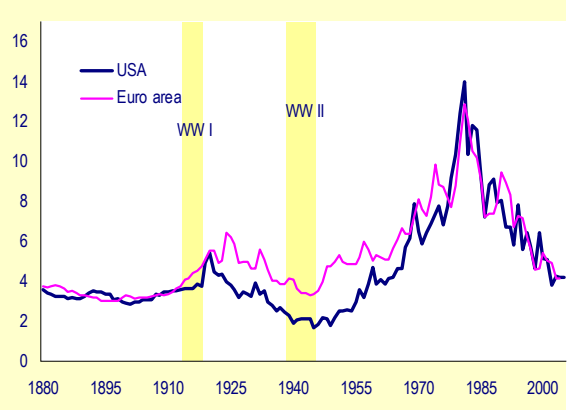
The judgment that bond yields are unusually low means that they are thought to be low relative to some objective criterion – historical norms, for example. Indeed, judging from a historical series based on long-run data for four 'core' euro-area countries (Belgium, Germany, France and the Netherlands), nominal 10-year 'benchmark' government bond yields in the euro area have reached lows that were recorded only in the heyday of the Gold Standard, before the First World War (see Graph 12).[6]

[5] In his testimony on the occasion of the Federal Reserve Board's semi-annual Monetary Policy Report to Congress on 16 February 2005, Greenspan said '…it is difficult to attribute the long-term interest rate declines of the last nine months to glacially increasing globalization. For the moment, the broadly unanticipated behaviour of world bond markets remains a conundrum. Bond price movements may be a short-term aberration, but it will be some time before we are able to better judge the forces underlying recent experience.'

[6] The choice of countries was partly determined by data limitations. However, for traditional high-yield countries such as Italy, data were not included even if they were available because the higher risk premia that prevailed

To some extent, this return of long-term interest rates to historical lows may reflect the return to some of the conditions that were prevalent for the last time before World War I: during the Gold Standard, 'monetary policy' was rules-based, potential real GDP growth was relatively weak and inflation expectations can be assumed to have been low on average in the advanced economies.

Graph 12: **Nominal 10-year government bond yields: a historical perspective** (in % – 1880 to 2005)



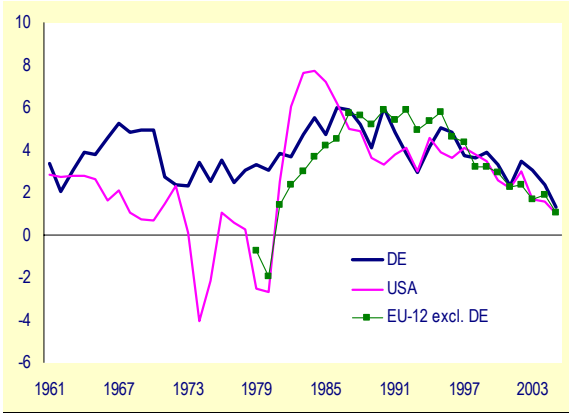
Source: Commission services, Deutsche Bundesbank, De Nederlandsche Bank.

In the USA, the current level of long-term interest rates is low but, as in the case of the euro area, not exceptionally low in a very long historical perspective. Nominal government bond yields were at even lower levels than in continental Europe in most years between 1880 and the early 1960s.

Comparing current nominal bond yields to historical yields may be misleading, because the history of recent decades includes periods of exceptionally high inflation that raised bond yields but are unlikely to be repeated any time soon. Accordingly, it could be more appropriate to also look at real or inflation-adjusted yields.[7]

Yet another approach to assessing the current level of bond yields is to compare them not only with historical norms, but also with some neutral or equilibrium interest rate. An economic rule of thumb inspired by growth theory suggests that, in the long run, real risk-adjusted interest rates should track the growth in trend or potential GDP. Over the cycle, real long-term interest rates should therefore resemble real GDP growth plus a Fisherian risk premium reflecting, inter alia, potential risks of accelerating inflation. In other words, the difference between the inflation-adjusted bond rate and trend real growth can be seen as a measure of the risk premium related to unexpected changes in inflation over the maturity of the bond.

Graph 13: **Real 10-year government bond yields** (1) (in % – 1961 to 2005)



(1) Deflated by CPI.
Source: Commission services.

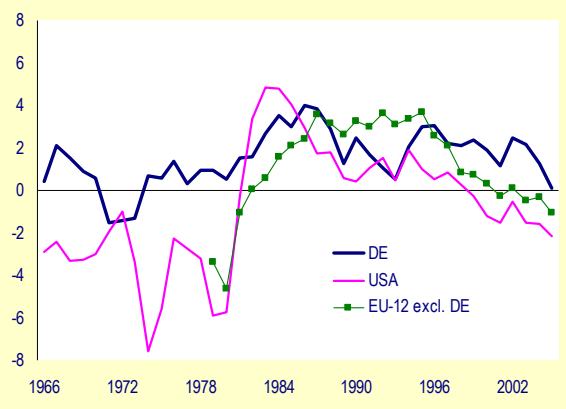
While this rule of thumb might hold in the very long run, the relationship between potential growth and 10-year-government bond yields is less clear-cut at shorter time horizons. However, in 2005 real bond yields in the euro area did fall below potential GDP growth for the first time

until convergence to the euro would have distorted the long-run comparison. Furthermore, it should be realised that during the classic Gold Standard, yields on British perpetuals were the best approximation to a risk-free rate, and before WWI these were even lower than the ones shown for the euro-area extrapolation. Long-run historical euro-area data have been constructed from data on Belgium, Germany, France and the Netherlands. Because data are missing for WWI for Belgium and WWI and WWII for Germany, the average of the other countries was taken as representative for those periods.

[7] When analyzing real interest rates, a distinction between ex-ante and ex-post measures should be made. Ex-post measures represent the effectively made return on an investment. Ex-ante measures reflect the expected return on an investment. (see e.g. ECB Monthly Bulletin, May 2005).

since the early 1980s.[8] For comparison, in the USA, real bond yields have been below potential GDP growth since 1999. This can be interpreted as being consistent with the inflation-related risk premium having been compressed to close to the low level that prevailed during the classic Gold Standard. This may reflect the impact on inflation expectations of successful anti-inflationary policies led by strong and independent central banks in advanced economies.

Graph 14: **Difference between real 10-year government bond yields** (1) **and potential GDP growth**
(in % – 1966 to 2005)

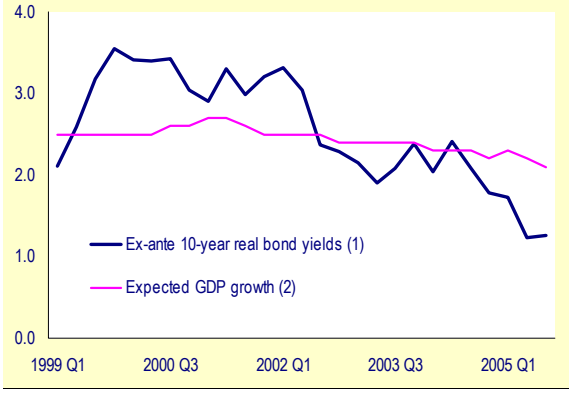


(1) Deflated by CPI.
Source: Commission services.

While the long-term assessment of real bond yields has so far been based on ex post measures of inflation due to data limitations, an assessment of the period starting in 1999 can be based on ex-ante measures. As illustrated in Graph 15, longer-term growth expectations for the euro area have declined from around 2.5% to some 2% between 1999 and 2005. Real ex ante bond yields have fallen from more than 3% to levels close to 1%, bringing real bond yields below long growth expectations.

To sum up, the long-run perspective suggests that, for the euro area at least, the recent development of bond yields reflects an environment which, in some key respects, more closely resembles the period before the First World War than the conditions that prevailed for most of the twentieth century. The low long-term real interest rate levels (particularly relative to real GDP growth) constitute a pronounced deviation from the past two decades in particular. But they are not so exceptional in a longer historical perspective. The current decline in bond yields could therefore mark a return to the earlier historical levels prevailing at times of low inflation, and the current level could become a permanent feature given the high credibility of monetary policy and its targets for price stability.

Graph 15: **Ex ante real 10-year government bond yields and expected GDP growth, euro area**
(in % – 1999Q1 to 2005Q3)



(1) Deflated by 5-years-ahead inflation expectations.
(2) 5-years-ahead GDP growth forecasts.
Source: Commission services, ECB Survey of Professional Forecasters.

Global factors matter…

Several global factors – often interrelated – have been put forward to explain the evolution in global long-term rates over the last year. Most of them refer to US rates but some can also be related to euro-area bonds. These factors include (i) increased central bank credibility in containing inflation; (ii) the mis-pricing of risks due to a coincidence of excess liquidity in the international financial system and investor search for yield; (iii) Asian central bank purchases of US Treasury bills to maintain their currency pegs; (iv) underinvestment in the corporate sector; (v) the prospect of population ageing due to which pension funds are being pressed to make significant additions to longer-term bond portfolios; and (vi) oil bill recycling.

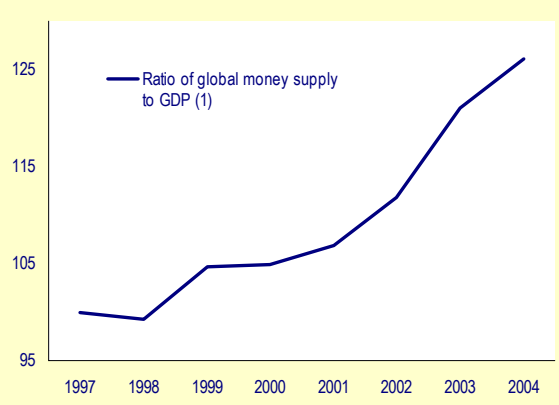
[8] The last episode in which real interest rates and real GDP growth rates were at comparable low levels was just before the World War I. Interpreting the data for the 1970s and 1980s is complicated by the fact that the crude ex-post measure applied here does not take into account the unexpected inflation shocks in that period.

Over the last decade, central banks all over the world have gained credibility as successful and determined inflation fighters. The outcome – historically low nominal interest rates – reflects the advantages of a stable and credible monetary framework in which risk premia for unexpected inflation are very low and inflation expectations are contained.

At the same time, the yields on inflation-indexed bonds also indicate that a declining price of inflation compensation cannot be the whole explanation for the low level of long-term yields. Also long-term 'real' rates of French indexed bonds fell noticeably by more than 100 basis points between mid-2004 and September 2005.

Several other non-cyclical factors can be grouped together under the heading 'ample supply of global liquidity'. Following the bursting of the stock market bubble at the beginning of the century, central banks in the major industrial countries massively loosened monetary policy. This subsequently led to a steep rise in global liquidity. The liquidity supply increased at a much faster rate than nominal output, resulting in a liquidity overhang leading to higher bond and real estate prices in many countries, as well as a rebound in equity markets from spring 2003 onwards. In the case of bonds, a search for yield has also resulted in historically low credit risk spreads for both corporate and emerging market bonds.

Graph 16: **Global excess liquidity as measured by the ratio of money supply to GDP** (1)
(1997=100, 1997 to 2004)

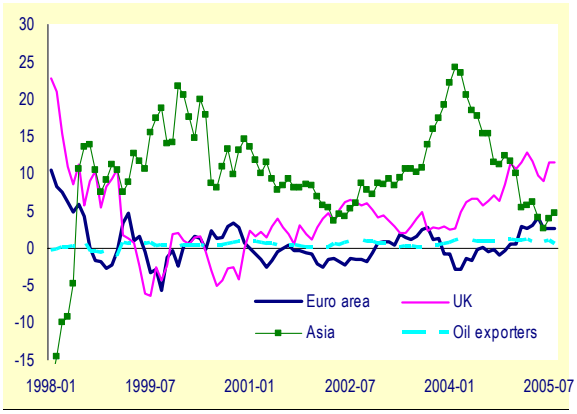


(1) M2 as a share of nominal GDP (USA, euro area, Japan and China).
Source: Commission services, EcoWin.

Contributing to this ample supply of global liquidity is the fact that many emerging market economies have adopted strategies to manage the flow of international capital since the financial crises in the 1990s. Since most of these crises were precipitated or exacerbated by the existence of large debts denominated in foreign currencies, monetary authorities in these countries have built up foreign exchange reserves by mobilising domestic savings and purchasing US Treasuries and other assets to immunise themselves against similar events in the future.

The most often cited example is the yuan-dollar peg, which has helped to sustain China's export-led growth. Less visibly, many other Asian economies, including Japan, Korea, and the Tigers, have created soft pegs with the US dollar to preserve their competitiveness with China, also facilitated by the purchase of US financial assets. It should be noted that the 'China-factor' has also contributed to lower long-term interest rates as exports of low-cost products from China have exerted downward pressure on inflation in the euro area.

Graph 17: **Composition of foreign purchases of US T-Bills** (in % – Jan 98 to Aug 05)



Source: Commission services and US Treasury.

Graph 17 shows the strong increase of Asian net purchases of US Treasury bonds and other federally sponsored agencies between 2002 and 2004. Since the beginning of 2004, net purchases by Asian countries have declined, still leaving a large amount of holdings in the hands of Asian countries. While the short-term link between foreign purchases of US government paper and

the low yields on 10-year-government bonds seems convincing, research shows mixed results.[9]

Since we know relatively little about international purchases of euro-area bonds, theoretically it would be conceivable that part of the build-up in Asian currency reserves was also made directly in euro or that the pressure on yields has spilled over into the European markets. For the United States, this effect will persist only as long as the dollar stays under depreciation pressure. But for the European markets it could prove a relatively permanent phenomenon if the euro establishes itself as a secure investment alternative to the US dollar.

As the interest rate is the price which equilibrates supply and demand of capital, the low level of bond yields is also claimed to be associated with a weak demand for long-term capital. Corporate investment, particularly in the euro area and the USA, has been low and savings in the corporate sectors have increased. Corporate profitability has been high, but these profits seem to have been applied to buybacks, dividend increases and mergers & acquisitions activity rather than reinvestment. This situation, which could partly reflect a lack of promising investment opportunities, has been weighing on the overall demand of capital.

Another driving factor behind the increased demand for long-term bonds is altered framework conditions for institutional investors. In particular, rising asset liability matching in retirement pension products is generating a strong demand for long-range investments with yield levels that are perceived as secure. Pension funds and insurance companies are being pressed to make significant additions to longer-term bond portfolios. This demand for increasingly longer-term obligations is evident in the favourable reception given to the fifty-year-maturity bonds recently issued by France and the United Kingdom.

A final factor driving the current bond yield level is the increase in oil prices, which has affected bond yields in two ways.

First, rising oil prices have pushed up current account balances in oil-exporting countries in the Middle East, Russia, Nigeria and Venezuela, which may have caused an increased demand for fixed securities. However, Graph 17 shows that the net purchases of US Treasury bonds by Venezuela and Russia have been rather stable at a very low level. However, limited data availability gives rise to speculations about how oil exporters might be re-investing their profits. Several options are possible: offshore dollar bank accounts; buying US debt through intermediaries, so that a Treasury bond bought by a private investor in the UK is actually owned by an investor in the Gulf; or buying euro debt, driving euro yields down, widening the differential between US and European long-term rates and thus inducing private European investors to shift into dollars.

Second, higher oil prices have affected market expectations differently than in the past. In the past, higher oil prices (which were largely supply-driven) led to increased inflation expectations and hence to higher nominal and real bond yields. Now, financial market participants seem to price in lower growth rather than higher inflation, eventually leading to lower nominal and real yields.

…but euro-area-specific macro factors should not be ignored.

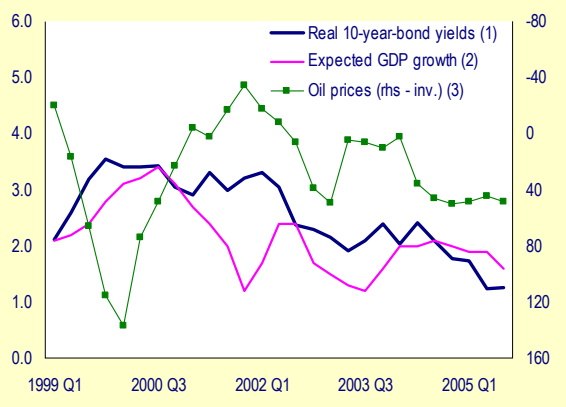
Although these global factors seem to have contributed to the recent decline in bond yields, euro-area-specific macroeconomic factors should not be overlooked.

Both potential and expected growth have deteriorated in the euro area in recent years. While the potential growth of the euro area is estimated to have dropped from slightly above 2.5 % in 1999 to slightly below 2% in 2005, short-term growth expectations have declined

[9] While several studies find that 10-year Treasury yields could be up to 150 basis points higher if foreigners had not accumulated US bonds, other studies suggest that there is more to the conundrum of the recent low long-term interest rates than the behaviour of official foreign purchases of US Treasury securities. (see for example Warnock, F. and V. Warnock (2005), International capital flows and US interest rates', Board of Governors of the Federal Reserve System, International Finance Discussion Papers, No. 840; and Wu, T. (2005), 'The long-term interest rate conundrum: not unraveled yet?', in: FRBSF Economic Letter, No. 2005-08, April 29, 2005).

more significantly in the same period. The one-year-ahead forecast for GDP growth in the euro area as published by the Survey of Professional Forecasters has slipped from 3.4% in Q3 2000 to 1.7% in Q4 2005. This continuous worsening of the outlook has contributed to a sharp decline in expected short-term interest rates. Graph 19 shows a strong correlation between the expected 3-months-money-market rate one year ahead and real long-term bond yields. This seems to indicate that the future stance of monetary policy matters for the determination of long-term interest rates.[10]

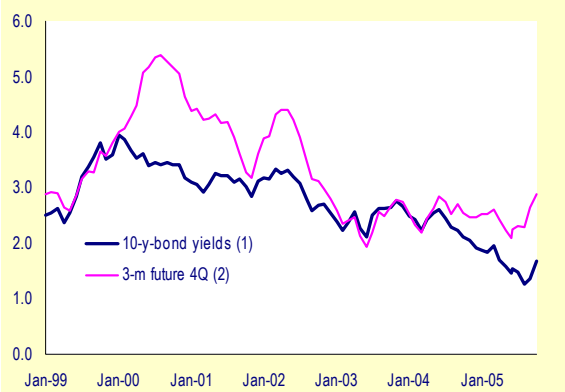
Graph 18: **Real bond yields, growth expectations and oil prices,** (in % – 1999Q1 to 2005Q3)



(1) Deflated by 5-year-ahead expected inflation.
(2) 1-year-ahead.
(3) USD per barrel, y-o-y change.
Source: Commission services, ECB Survey of Professional Forecasters, EcoWin.

To sum up, the low level of bond yields appears to be less of a conundrum in the euro area than in the USA, given monetary policy (expectations), lower (potential) economic growth expectations and changes in pension funds regulations.[11] The recent pick-up in European bond yields since the beginning of October seems to support this finding as it appears to have mainly been driven by market expectations about future ECB hikes and lower oil prices. However, over the last fifteen years, bond market developments have been increasingly influenced by global trends – most of all by US bond developments. The spread between US and German bond yields has fluctuated between +150 and -150 basis points and was at 105 basis points in November. Euro-area bond yields could therefore increase in response to US yield increases irrespective of euro-area-specific macroeconomic factors.

Graph 19: **Real 10-year government bond yields and monetary policy expectations** (in % – Jan 99 to Nov 05)



(1) Deflated by 1-year-ahead inflation forecast.
(2) 3-months future 4 quarters ahead.
Source: Commission services, ECB Survey of Professional Forecasters, EcoWin.

[10] However, there is a potential reverse causation from long-term real rates to the stance of monetary policy. For example, if long-term real interest rates are high because the economy is expected to grow rapidly over the next years, inflationary fears may force the central bank to raise short-term interest rates.

[11] For instance, in the Netherlands a new supervisory framework will come into effect in 2006, requiring Dutch pension funds and life insurers to value assets and liabilities on a marked-to-market basis.

Focus

II. Ageing populations in the euro area: what impact on employment and growth?

This focus presents an assessment of the economic impact of an ageing population for the euro area from 2004 to 2050, pointing to pressing economic policy challenges for the euro area. The shrinking of the working-age population will result in total employment growth slowing down in the period 2012-2016 and henceforth becoming negative despite rising participation in the labour market. Therefore, euro-area policy makers should exploit the narrow window of opportunity opened until 2012, when labour supply is not much affected by ageing. Once the window is closed, the growth rates in economic activity and in living standards will fall steadily to levels well below those observed in recent decades. Moreover, the sources of economic growth will alter over time, with productivity becoming the only driver of growth. Fiscal challenges will come from the rising imbalance between an increasing proportion of older people and a declining share of those economically active.

As regards policy conclusions, the focus underlines that achieving the Lisbon employment targets will not be sufficient to offset the effects of demographic change, which stresses the critical role of labour-market reforms and of polices aiming at raising productivity. Ageing is an evolving process and a key challenge is to improve the labour-market functioning and adapt welfare-state policies to make them sustainable in the face of uncertain economic and demographic developments. In particular, expected financing problems in public pension schemes stem to a large extent from the failure of contribution/entitlement parameters in public pension schemes such as the retirement age to adjust in the face of increased life expectancy.

1. A quick overview of key demographic trends and prospects[12]

The euro-area population will undergo dramatic changes in coming decades due to low fertility rates, continuous gains in life expectancy and large inward migration. Since the launch of the euro, considerable attention has been paid to the budgetary implications of ageing populations and their effect on the sustainability of public finances. In their most recent assessment, the Commission and Council concluded that there are significant risks to the sustainability of public finances in most of the euro-area Member States.[13]

This focus section addresses the equally important issue of the impact of ageing on the real economy, and in particular on employment and growth. It presents new projections of the impact of ageing on the labour market and potential economic growth up to 2050 for the euro area as a whole and its Member States.[14]

According to the latest Eurostat projection, the population in the euro area will be older in 2050, as a result of three factors. [15]

- *Low fertility rates remaining persistently below the natural replacement rate:* from 1.5 for the euro area in 2004, Eurostat projects only a limited

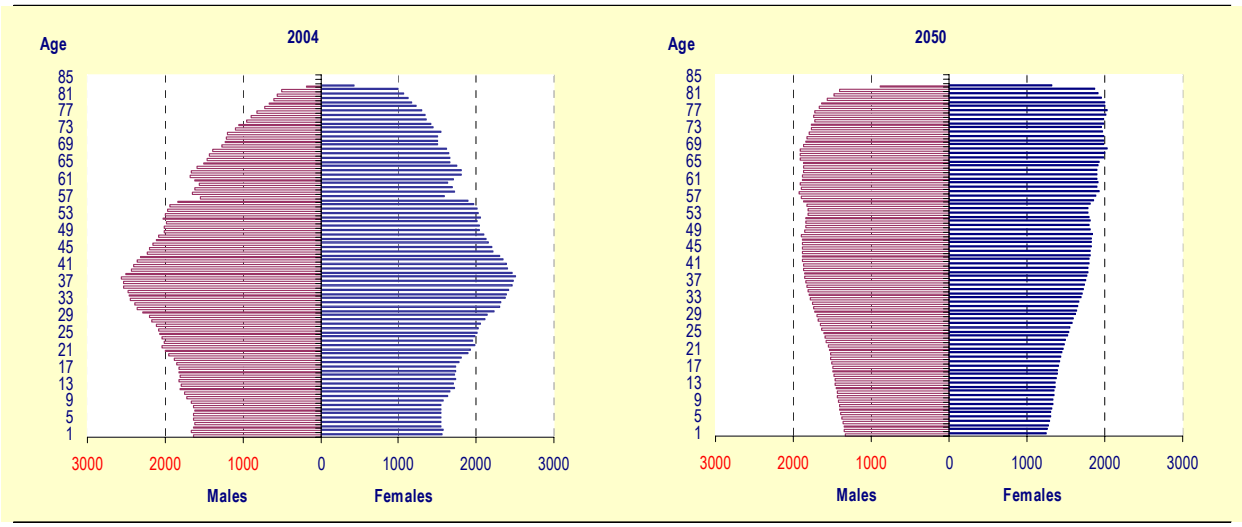
[12] The focus section draws upon the macroeconomic assumptions developed by the Ageing Working Group attached to the EPC and the Directorate-General for Economic and Financial Affairs.

[13] This assessment is made in the context of the annual analysis of national Stability and Convergence programmes. A summary of the Commission and Council's most recent assessment can be found in European Commission (2005), 'Public finances in EMU – 2005', *European Economy,* No 3, 2005, pp 50-64.

[14] These projections have been made as part of a joint effort undertaken with the Ageing Working Group attached to the Economic Policy Committee to produce age-related expenditure projections on pensions, health care, long-term care, education, and unemployment transfers. The projections will be finalised in early 2006, and are made on the basis of a 'no-policy change' assumption, i.e. they reflect currently enacted pension and health care polices. Full details on the underlying assumptions and projection methodologies can be found in EPC and European Commission (2005), 'The 2005 EPC age-related expenditure projections: agreed underlying assumptions and projection methodologies', *European Economy Special Reports,* No 4, http://europa.eu.int/comm/economy_finance/publications/european_economy/2005/eespecialreport0405_en.htm

[15] The population projections presented in this focus were prepared by Eurostat for the Ageing Working Group attached to the EPC.

Graph 20: **Age pyramids for the euro-area population, 2004 and 2050** (in 000s)



Source: Commission services.

recovery to 1.6 by 2050.[16]

- *Continuous increases in life expectancy:* life expectancy at birth for males in the euro area is projected to rise by almost 6 years to 82.1 in 2050, and by more than 4.5 years for females to 87.2. Much of the projected gains in life expectancy will occur at higher ages, and life expectancy at 65 is projected to increase by about 3.5 years by 2050.
- *Net inward migration* into the euro area currently amounts to 1.2 million people, i.e. 0.4% of the population. It is projected to fall to 700 000 persons by 2010 (0.2% of the population) and to remain at that level thereafter.

The total population of the euro area will remain almost unchanged at some 308 million up to 2050.[17] However, there are wide differences across countries, reflecting quite uneven projected developments in fertility, life expectancy and migration. Significant increases in several euro-area members (BE +4%, NL +8%, FR +9%, IE +36% and LU +42%) contrast with projected declines in four countries (GR -3%, PT -4%, DE –6% and IT -7%), while population is projected to remain broadly constant in 3 countries (FI, ES and AT).

Of more significance are the dramatic changes projected as regards the age structure of the population. As illustrated in Graph 20, the euro-area population in 2004 contains a bulge in persons of working age. By 2050, an inverted cone shape is evident, reflecting the passage of baby boomers into retirement years, increasing life expectancy and the effects of prolonged low fertility rates.

The share of young persons aged 0-14 in the total population is projected to decline, with their overall numbers dropping by 18% until 2050. From an economic perspective, the most relevant change concerns the working-age population (15-64). This will start to fall as of 2010 in the euro area (sooner in some countries), and drop by 37 million, or 18%, by 2050. Again, Member State divergences are wide, with declines of more than 20 pp projected in 5 countries (DE, GR, ES, IT, PT). In contrast, the elderly population aged 65+ will rise sharply, by 41 million (or 78%), by 2050. The fastest growing segment of the population will be the very old (80+) whose number will rise by almost 24 million, an increase of 189%.

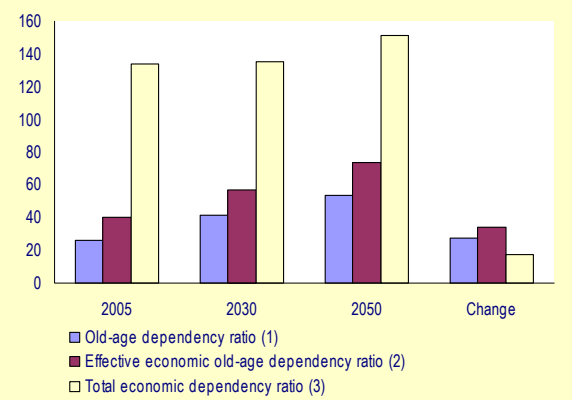
As shown in Graph 21, over the next decades, the old-age dependency ratio, that is, the number of people aged 65 years and above relative to those between 15 and 64, is projected to double and reach 53% in 2050. This means that the euro

[16] The most important indicator of fertility (i.e. total period fertility rate) is the average number of children of a hypothetical or 'synthetic' generation of women.

[17] It should be borne in mind that euro-area population will increase until 2025 and then revert back to its 2003 level.

area will go from the current situation of four people of working age for every elderly citizen to a ratio of 2 to 1. A modified concept is the 'effective economic old-age dependency ratio', which is the number of non-active persons aged 65 and above as a percentage of employed persons aged 15 to 64. This ratio is higher than the old-age dependency ratio, and projected to rise sharply for the euro area from 40% in 2004 to 57% in 2025 and 74% in 2050.

Graph 21: **Dependency ratios** (in %)



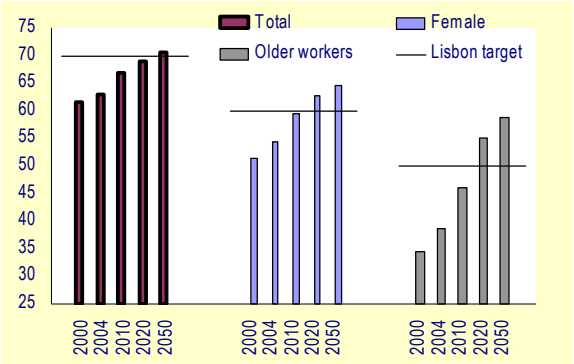
(1) 65+ as share of population 15-64.
(2) Non-active 65+ as % employed population 15-64.
(3) Total population less employed as % of employed pop. 15-64.
Source: Commission services.

2. *The impact of ageing on the labour market*

A new labour-force projection shows the Lisbon employment targets will be reached, albeit behind schedule

Based on this population projection, a new labour force projection has been produced for the period up to 2050 (see Graph 22).[18] The overall employment rate in the euro area is projected to rise from 63% in 2004 to 67% in 2010 and the Lisbon employment rate of 70% would be reached in 2035 only. However, it is worth stressing that the employment rates of many euro-area countries would lag behind the euro-area average.

Graph 22: **Projected employment rates and Lisbon targets in the euro area** (in %) (1)



(1) Employment rates are defined as the number of persons employed divided by the size of the working age population (15-64); data for 2000 and 2004 are historical; data for 2010-2050 are projections.
Source: Commission services.

The projected increase of the employment rate in the euro area is mainly due to rising employment rates for females and older workers.

The female employment rates is projected to rise from just over 54% in 2004 to 62% in 2015 and – more slowly – to 64% by 2034, remaining broadly stable thereafter. This would imply that the 60% Lisbon employment rate target for females will be reached just one year after the targeted year of 2010 due the gradual replacement of older women with low participation rates by younger women who have a much stronger attachment to the labour market.

The employment rate of older workers in the euro area is projected to increase sharply from almost 39% in 2004 to 47% by 2010 and 59% in 2025. This is well in excess of the 50% Lisbon employment target which is projected to be reached by 2013. The projection reflects the observed trend increase in the employment rate of older workers in recent years (up by 4.3 pp since 2000). A significant part of the projected increase in the employment rate is due to the positive effects of recent pension reforms, which have curtailed access to early-retirement schemes, raised statutory retirement ages (including minimum

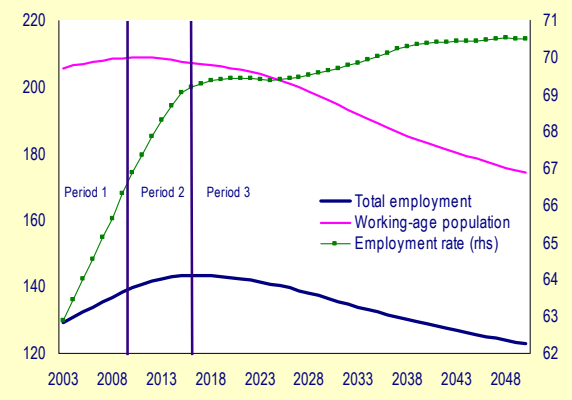
[18] The detailed analysis can be found in Carone, G. (2005), 'Long-term labour force projections for the 25 EU Member States. A set of data for assessing the economic impact of ageing', *Economic Papers*, Directorate-General for Economic and Financial Affairs, forthcoming. The labour-force projection was made by extrapolating forward employment rates by gender and age (young, prime age, older worker) on the basis of recently observed trends.

ages from when pension income can be drawn), and increased the financial incentives in pension systems to delay retirement.

Following a brief window of opportunity employment will decrease significantly

Meeting the Lisbon employment target, albeit with a considerable delay, will temporarily cushion the effects of ageing on the labour force. In the end, however, demographic forces will outweigh the improved labour market performance and the overall numbers of persons employed will start to decline. For the euro area as a whole, three distinct time periods can be observed (as shown in Graph 23).

Graph 23: **Projected working-age population and total employment, euro area** (in millions – 2003 to 2050)



(1) 2003-2011.
(2) 2012-2016.
(3) From 2017 onward.
Source: Commission services.

2004-2011 – a window of opportunity when both demographic and employment trends are favourable: both the working-age population and the number of persons employed are set to increase during this period. Although the rate of increase is slowing down, this period can be viewed as a window of opportunity for structural reform since both demographics and labour force trends are supportive of growth.

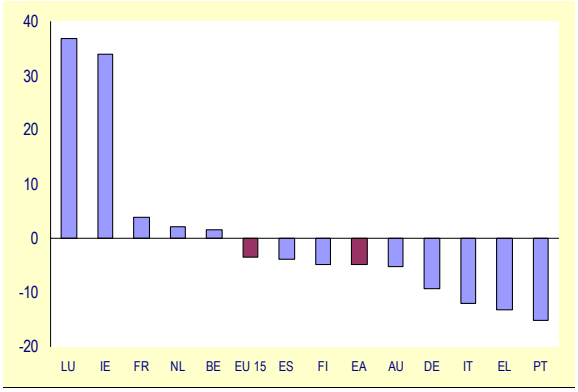
2012-2016 – rising employment rates offset the decline in the working-age population: during this period, the working-age population will start to decline as the baby boom generations enter retirement. However, the continued projected increase in the employment rates of women and older workers will cushion the demographic factors and the overall number of persons employed will continue to increase, albeit at a slower pace. From 2012 onwards, the tightening labour market conditions (lower labour-force growth together with unemployment down to NAIRU) may increase the risk of labour market mismatch. It should also be noted that this window of still growing employment is projected to be slightly narrower than that of the EU25, where employment is expected to decline as of 2018.

The ageing effect dominates from 2017: the trend increase in female employment rates will broadly have worked itself through by 2016, and the employment rate of older workers is projected to reach a steady state in the absence of further pension reform. Consequently, there is no counter-balancing factor to ageing, and thus both the size of the working-age population and the number of persons employed are on a downward trajectory. Having increased by some 12 million between 2004 and 2016, employment during this last phase is projected to contract by over 20 million, i.e. a fall of some 8 million over the entire projection period.

Employment prospects differ across countries

The broad trends described above are common to many countries, but they are not uniform.

Graph 24: **Projected employment growth, euro-area Member States** (% change over 2003-50)



Source: Commission services.

As shown in Graph 24, the two smallest Member States (IE, LU) are projected to experience a

Table 3: **Projected potential growth rates in the euro area and their determinants (employment/productivity) over 2004-2050** (% annual average)

	Real GDP growth in 2004-2050	Due to growth in						
		Productivity of which	TFP	Capital deepening	Labour input of which	Population	Employment rate	Share of working age population
	1=3+6	3=4+5	4	5	6=7+8+9	7	8	9
BE	1.7	1.7	1.1	0.6	0.1	0.1	0.2	-0.3
DE	1.3	1.6	1.1	0.5	-0.2	-0.1	0.2	-0.2
EL	1.5	1.8	1.0	0.8	-0.1	-0.1	0.4	-0.4
ES	1.6	1.7	1.0	0.7	-0.0	0.1	0.4	-0.5
FR	1.8	1.7	1.1	0.6	0.1	0.2	0.2	-0.3
IE	2.9	2.3	1.5	0.8	0.6	0.7	0.3	-0.3
IT	1.3	1.6	1.0	0.5	-0.2	-0.1	0.3	-0.5
LU	3.1	1.8	1.1	0.8	1.3	0.8	0.7	-0.2
NL	1.7	1.6	1.1	0.6	-0.0	0.2	0.1	-0.2
AT	1.5	1.7	1.1	0.6	-0.1	0.0	0.2	-0.4
PT	1.5	1.9	1.2	0.7	-0.5	-0.1	0.0	-0.5
FI	1.8	1.9	1.4	0.5	-0.1	0.0	0.2	-0.3
Euro area	1.5	1.6	1.1	0.6	-0.1	0.0	0.3	-0.4
EU 15	1.6	1.7	1.1	0.6	-0.1	0.0	0.2	-0.3
EU 25	1.7	1.8	1.2	0.6	-0.1	0.0	0.2	-0.3

Source: Commission services.

pronounced rise in employment between 2003 and 2050,[19] while the change in employment in three euro-area Member States (FR, NL, BE) is projected to be slightly positive. Four Member States are projected to see falls in employment that are well above the average for the euro area of -5% over the entire projection period (DE, GR, IT, PT).

3. The impact of ageing on potential growth

Potential growth rates will fall over time in almost all euro-area countries...

By combining the employment and productivity forecasts, a projection has been made for potential GDP growth rates up to 2050. Labour productivity is assumed to converge to a growth rate that is broadly in line with the trend observed in the US and the euro area over the past three decades.[20] For euro-area countries, labour productivity growth is projected, on average, to be 1.6% for the period up to 2050.

Graph 25: **Potential growth, its sources and per capita GDP growth**
(average annual % growth in three sub-periods)

Source: Commission services.

[19] This is due mostly to favourable demographic developments. In addition, the employment rate is also projected to rise strongly in Luxembourg.

[20] The complete analysis, the detailed assumptions used, as well as various sensitivity tests, can be found in Carone, G., Denis, C., McMorrow, K., Mourre, G. and W. Röger (2005), 'Long-term labour productivity and GDP projections for the EU25 Member States: a production function approach', *Economic Papers*, Directorate-General for Economic and Financial Affairs, forthcoming.

Table 4: **Projected potential growth rates in the euro area** (%-annual average)

	Potential growth			Productivity			Employment		
	2004-10	2011-30	2031-50	2004-10	2011-30	2031-50	2004-10	2011-30	2031-50
BE	2.4	1.7	1.5	1.5	1.8	1.7	0.9	-0.1	-0.2
DE	1.7	1.4	1.2	0.9	1.6	1.7	0.8	-0.3	-0.5
EL	2.9	1.6	0.8	2.1	1.8	1.7	0.9	-0.2	-0.9
ES	3.0	2.0	0.6	1.1	1.9	1.7	1.9	0.1	-1.1
FR	2.2	1.8	1.6	1.4	1.7	1.7	0.8	0.1	-0.1
IE	5.5	3.3	1.6	3.4	2.5	1.7	2.1	0.8	-0.1
IT	1.9	1.5	0.9	0.7	1.7	1.7	1.1	-0.2	-0.8
LU	4.0	3.0	3.0	1.8	1.9	1.7	2.2	1.0	1.3
NL	1.7	1.6	1.7	1.1	1.7	1.7	0.6	-0.1	0.0
AT	2.2	1.6	1.2	1.5	1.8	1.7	0.7	-0.2	-0.5
PT	1.9	2.1	0.8	1.2	2.4	1.7	0.7	-0.3	-0.9
FI	2.7	1.7	1.5	2.1	2.0	1.7	0.6	-0.3	-0.2
Euro area	2.1	1.7	1.2	1.1	1.8	1.7	1.0	-0.1	-0.5
EU 15	2.2	1.8	1.3	1.3	1.8	1.7	0.9	-0.1	-0.4
EU 25	2.4	1.9	1.2	1.5	2.0	1.7	0.9	-0.1	-0.5

Source: Commission services.

As illustrated in Graph 25, potential growth is projected to decline as a result of ageing populations. The annual average potential GDP growth rate is projected to decline from 2.1% in the period 2004-10 to 1.7% in the period 2011-30, and to 1.2% between 2031 and 2050. The average potential growth rate is projected to be 1.5% over the whole projection period from 2004 to 2050 (see Table 3).

In Table 4 the projections are broken down into three subperiods. Almost all countries are projected to experience a steady decline in potential growth, although there are large differences in the projections across countries. These differences mainly reflect divergent employment growth over the whole projection period along with different recent trends in productivity growth, which are partly carried over to the start of the projection. In many countries (DE, GR, ES, IT, AT, PT), potential annual growth rates will drop to close to, or below, 1% during the period 2030 to 2050. Only a few small countries (LU and IE) are projected to enjoy an average growth rate higher than 2.5%. Over the whole period, most countries are expected to grow at a rate ranging from 1.5% to 1.8%.

As shown in Graph 25, living standards as measured by GDP per capita should also decline after 2012. It is, however, projected to hold up slightly better at the end of the projection than what is suggested by the trend in the headline GDP growth rate. Indeed, the growth in GDP per capita depends on the change in the age structure of total population (i.e. share of working-age population over total population), while potential growth hinges not only on the latter but also on the change in the total population size, which is projected to decline from 2025.

… and the sources of growth will change with productivity becoming dominant

In addition to falling potential GDP growth rates, the sources of growth will alter dramatically. Employment will make a positive contribution to growth in the euro area up to 2010, become broadly neutral in the period 2011-2030 and turn significantly negative thereafter.

In practice, increasing employment rates (which on average will contribute 0.3 pp to average GDP growth over the projection period up to 2050) partly offset the decline in the share of the working-age population (which will be a negative

drag on growth by an average of -0.4 pp). Over time, productivity will become the dominant and, in some countries, the only source of growth.

4. Policy implications

Significant, but not insurmountable, policy challenges lie ahead[21]

The projections point to pressing economic policy challenges for the euro area. From an economic perspective, potential growth rates and increases in living standards would fall to rates below those observed in recent decades.

Pressure for increased public spending will result from the higher share of the total population in older age cohorts that require larger public transfers (e.g. pensions) and services (health care, long-term care). The sheer size of this pressure will raise complex issues on the role of public transfers in achieving an appropriate distribution of resources between a smaller active population and a larger inactive retired population.

Some positive developments are underway, in part due to reforms already carried out

A number of positive indications nonetheless emerge from the analysis.

Firstly, employment rates and levels are projected to continue rising for at least a decade, which will offset somewhat the decline in the size of the working-age populations and provide a window of opportunity to undertake necessary reform measures.

Secondly, projections confirm the validity of the approach adopted by the EU in the Lisbon strategy. They already incorporate the achievement of the overall Lisbon employment targets (although only by 2035), but also confirm the importance of policies to raise productivity. Higher levels of investment in physical and human capital, together with efforts to strengthen innovation and R&D activities, could yield substantial productivity gains over the long run, especially against the background of a knowledge-based society.

Thirdly, the analysis shows that policy reforms work and that they can have a material impact on the capacity of economies to cope with the economic impact of ageing. Whilst the major part of the projected increase in total employment is due to the autonomous effect of higher female employment rates linked to societal change, structural reforms will play a non-negligible role, especially in the case of older workers. The projections indicate that reforms already enacted by Member States could significantly contribute to the increase in the employment rate of older workers.[22] This projected increase in employment is welcome and will make a positive contribution to economic growth.

Does the euro area need to look beyond the Lisbon employment targets in the face of ageing?

Even if the euro area as a whole achieves the Lisbon employment targets (albeit considerably later than the original target date of 2010), this will not be sufficient to offset the economic effects of demographic change. It is worth recalling that the employment rates of several individual countries will remain below the 70% Lisbon target in 2050 and that there will be substantial unused labour capacity. For example, many countries would continue to have substantial gender employment gaps. The better integration of migrants, measures to tackle the grey economy and the abuse of disability schemes, together with efforts to address social exclusion that leads to lasting inactivity could all further raise labour supply.

Moreover, the projected very strong increase in the euro area employment rate of older workers to around 59% by 2025 needs to be viewed in context, as it is still lower than that observed today in countries such as the USA. Moreover, it implies that a significant number of persons would continue to withdraw early from the labour force despite increasing life expectancy and improving health at older ages. Given these considerations, it is important to look beyond the

[21] The conclusions in this section draw heavily on Carone, G., Costello, D., Diez-Guardia, N., Przywara, B., Mourre, G. and A. Salomaki (2005), 'The economic impact of ageing populations', *Economic Papers*, Directorate-General for Economic and Financial Affairs, forthcoming.

[22] See Carone (2005) and Carone et al. (2005).

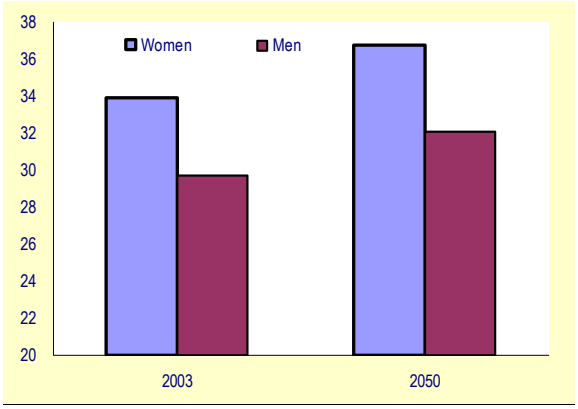
Lisbon targets, which, after all, are an aggregate goal of the EU as a whole.

Does Europe face an ageing challenge or a retirement challenge?

Ageing is a dynamic process, and the policy challenge is to develop labour-market and welfare-state policies which are adaptable and sustainable in the face of uncertain economic and demographic developments.

The dynamic challenge is illustrated in Graph 26, which shows the percentage of adult life (age15+) which is spent in retirement in 2003 and the projected level in 2050. In the euro area, the average exit age from the labour market is 61.7 for males and 61.3 for females. By 2050, this is projected to have risen to 62.7 and 61.8 respectively. This implies an increase in the share of adult life spent in retirement, from 30% to 32% for males, and from 34% to 37% for females. In order to keep the share of adult life spent in retirement constant at its 2003 level, the average exit age would need to rise by an additional 2 years for both males and females, i.e. an increase which is considerably larger than projected. *A priori,* there is no economic rationale for favouring a constant share of adult life spent in retirement, and indeed a preference for a longer period of leisure time in retirement could be justified on the basis of rising living standards. However, retirement decisions need to be economically and financially viable.

Graph 26: **The share of adult life spent in retirement – euro area** (in %)



Source: Commission services.

Achieving the necessary extension in working lives will prove challenging, as adjustments will have to be made in people's expectations and behaviour. It not only requires ensuring that tax/benefit and wage systems provide financial incentives to remain economically active and to invest in human capital, it is also necessary to enhance job opportunities for older persons who posses appropriate skill sets. Policies to tackle age discrimination and to promote life-long learning, flexible retirement pathways and healthy work conditions warrant careful consideration. Flexible retirement ages adapting to higher life expectancy could be an efficient policy response to this challenge.

Focus

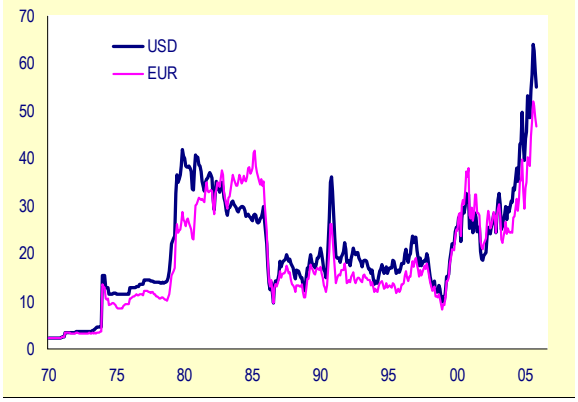
III. The impact of higher oil prices on inflation [23]

Substantial and lasting increases in oil prices over the last two years have led to concerns about rising inflation. The energy component of the HICP currently contributes close to one percentage point to headline inflation in the euro area. In addition to these direct effects, indirect price pressures are beginning to be felt as producers pass on higher input costs into their final prices. In general, the total contribution of rising oil prices to headline inflation via indirect effects is estimated to be only slightly smaller than the contribution via direct effects. However, indirect effects tend to materialise with a significant time lag and feed through into consumer price inflation over a longer period than direct effects. Due to these lags, indirect effects could exert significant upward pressures on core inflation in 2006 even if oil prices remain at their current levels. Second-round effects have so far remained muted. Wage demands have not reacted noticeably to rising energy costs, as labour market conditions remain weak in most Member States and inflation expectations have remained contained.

1. Recent developments in oil prices

The past two years have seen a steady and substantial rise in oil prices. Based on monthly averages, the price of Brent increased from around 30 USD/bl in February 2004 to over 64 USD/bl in August 2005. Prices eased between September and November but have increased again since end-November and were at 59 USD/bl in mid-December. They are expected to remain high for the years ahead.

Graph 27: **Developments in oil prices**
(Jan 1970 to Nov 2005)



Source: IMF and Commission services.

There are certain key differences between the recent oil price increase and previous shocks in which oil prices remained at a high level for several years (1974, 1979 and 1999-2000). While the percentage increase of oil prices in euro has been smaller for the 2004-05 period than for previous oil price shocks in both nominal and real terms, the level changes have been comparatively larger (Table 5).

Table 5: Brent crude oil price developments: comparison of various price hikes

	Dec 73 Dec 74	Nov 78 Dec 79	Jun 99 Sep 00	Feb 04 Aug 05
	Change in %			
Nominal (USD)	154.3	171.8	109.1	107.6
Nominal (EUR)	143.4	152.9	148.8	113.6
Real (EUR)(1)	128.1	139.4	146.0	109.8
	Change in level *(initial level within brackets)*			
Nominal (USD)	7.1 (4.6)	25.6 (14.9)	17.0 (15.6)	33.2 (30.9)
Nominal (EUR)	5.4 (3.8)	16.4 (10.0)	22.4 (15.0)	27.7 (24.4)

(1) Oil prices are deflated with the EU12 CPI data before 1991 and the euro-area HICP data thereafter.

Source: IMF and Commission services.

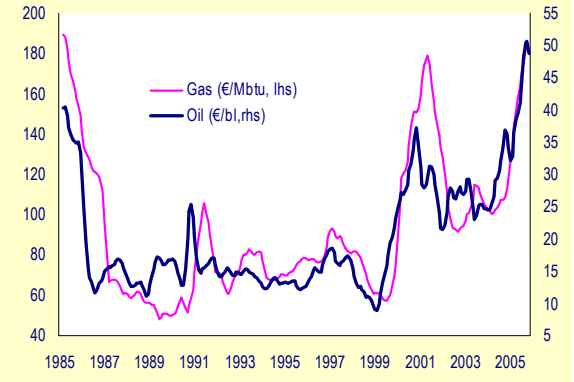
More importantly, the factors driving the price increase in 2004-05 differ from earlier oil price shocks. While the three previous oil price shocks were mainly caused by sizeable disruptions to oil supply, a variety of factors have had an impact on the oil price increase in 2004-05. A major factor was a more buoyant than expected

[23] The impact of higher oil prices on growth was analysed in a previous issue. See QREA Vol. 3, N° 2 (2004) "How vulnerable is the euro-area economy to higher oil prices?"

demand for oil. According to the International Energy Agency (IEA), growth in world demand for oil accelerated from 2.3% in 2003 and 3.7% in 2004. China and the USA were the key drivers behind the surge in oil demand in 2004. China alone accounted for about 30 percent of the increase in world demand for oil that year, while Asia and America together accounted for nearly 70% of the rise. Despite high oil prices, demand for oil is estimated to have expanded by about 2% in 2005.

Another important factor that has contributed to the recent price rise is the increase in uncertainties regarding the security of oil supplies. Numerous acts of sabotage in Iraq, threats to the oil infrastructure of other Middle Eastern producers and civil unrest in Nigeria have caused concern with regard to the possibility of supply disruptions and put upward pressure on oil prices. Over the summer, concerns over possible supply disruptions due to hurricanes in the Gulf of Mexico also played a temporary role.

Graph 28: **Oil and gas prices** (1)
(three-month averages Jan 1985 to Nov 2005)



(1) Gas prices = Russian border price.
Source: Ecowin.

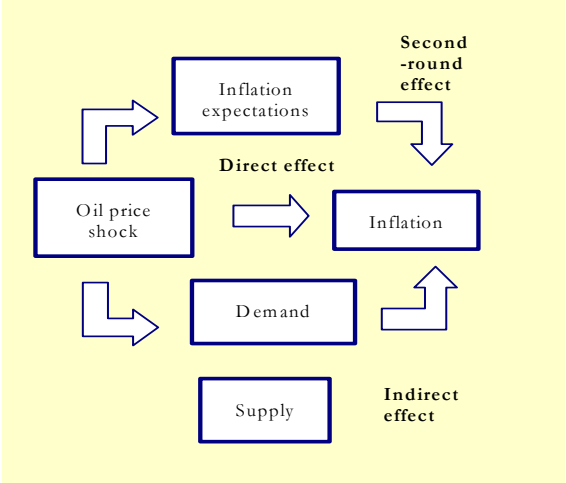
Finally, supply bottlenecks for light and sweet grades of oil also help to explain the oil price increase in 2004-05. Very high demand for finished oil products of light and sweet grades of oil, such as petrol, diesel and heating oil, coupled with environmental regulations have put a great strain on the existing capacity for processing heavy and sulphur-rich grades of oil. This factor appears to have been particularly important in 2004, when the quality-related premiums that had to be paid for light and sweet grades of oil, such as Brent, over heavy and sour grades of crude oil, such as Dubai, rose temporarily to over 15 USD/barrel. While in 2005 the spreads have narrowed, they remain around three times as high as their historical average.

Changes in oil prices also spill over into other energy markets. Especially gas markets follow oil market developments closely. Graph 28 shows that gas prices have increased between September 2004 and September 2005 by 70%. Gas prices tend to follow oil price developments with a lag of 6 months or more.

2. The impact of oil prices on inflation: reviewing the channels

Increases in oil prices can affect inflation in different ways. These include a direct effect, indirect effects via the demand- and supply-side channels on the product market, and second-round effects via the wage bargaining process and inflation expectations (Graph 29).

Graph 29: **A flow chart of oil prices' effects on the economy**



Source: Commission services.

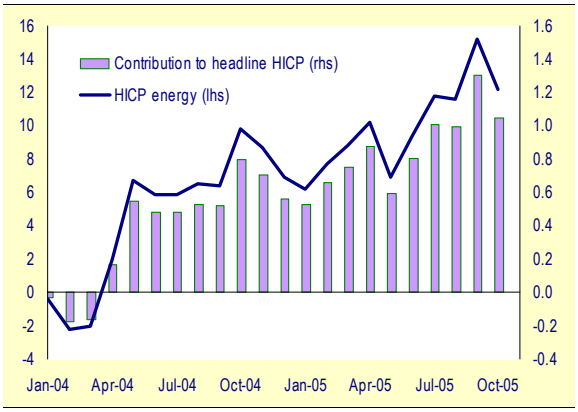
The present section reviews the relative importance of these three transmission channels, while the next section provides an assessment of the overall size of the inflationary effect of the recent oil price increase based on model

simulations. It should be noted that an oil price change may impact on the real economy via several other transmission channels, such as confidence effects, changes in the terms of trade and stock market developments. These channels on the real economy have been analysed in an earlier issue of the QREA.[24]

The direct effects

The direct effect refers to the impact of an oil price change on the overall HICP of the euro area through its immediate effect on the consumer prices of energy. The energy component in HICP accounts for about 8.6% of the total HICP consumption basket (in 2005). Its average contribution to HICP inflation during the period 1991–2003 was 0.2 pp. Based on annual averages, Brent prices in EUR/bl increased by 21% in 2004 while energy inflation picked up to 4.5% that year, contributing about 0.4 pp to headline HICP in the euro area (Graph 30). During the first ten months of 2005, crude oil prices in euro increased further by 45%,[25] while energy inflation averaged 10%, adding almost 0.9 pp to headline HICP.

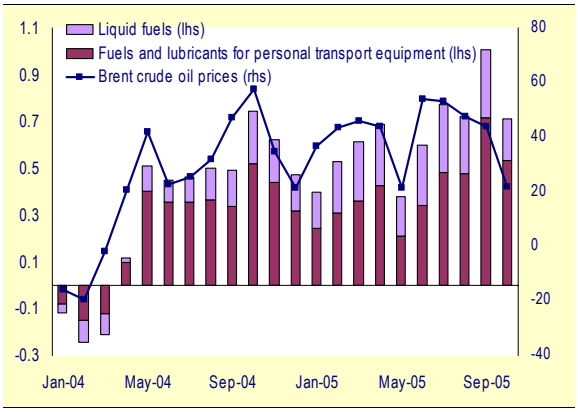
Graph 30: **Energy inflation, euro area** (y-o-y in % – Jul 2003 to Oct 2005)



Source: Commission services.

The energy sector of the HICP is broadly defined and includes next to oil and oil-products also other categories like electricity, gas, solid fuels and heat energy, which differ in the degree to which they are linked to developments in oil markets. The direct impact of the oil price increase to energy prices is obviously strongest for the subcomponents 'liquid fuels' and 'fuels and lubricants for personal transport equipment', which, together, contributed 0.3 pp to headline HICP in 2004. In the first ten months of 2005, the contribution from these energy components doubled to 0.6 pp (Graph 31).

Graph 31: **Contribution of energy components to HICP inflation, euro area** (y-o-y in % – Jul 2003 to Oct 2005)



Source: IMF and Commission services.

Table 6 shows very high correlations between oil prices and the two oil-related subcomponents, 'liquid fuels' and 'fuels and lubricants for personal transport equipment'. The correlation for the overall energy component of the HICP is slightly lower, reflecting the strong but less direct link to non-oil-related subcomponents.

Table 6: **Correlations between oil prices and HICP energy components** (in %) (1)

HICP component (weight in 2005)	**Correlation** (Jan 1995- Oct 2005)
Energy (8.6%)	94.9
Fuels and lubricants for personal transport equipment (3.9%)	96.7
Liquid fuels (0.8%)	98.0

(1) Brent in EUR/bl.
Source: IMF and Commission services.

Econometric analysis shows that the pass-though of an increase in Brent prices into energy price inflation is quite rapid (Box 2). About three quarters of the impact of an oil price increase is already felt in consumer energy prices after 1 month. Some additional (though moderate) inflation pressures are felt 6 to 12 months

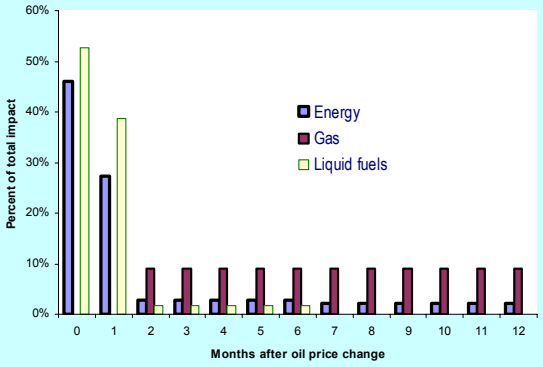
[24] QREA Vol. 3, N° 2 (2004) "How vulnerable is the euro-area economy to higher oil prices?"

[25] Average over first 10 months of 2005 compared with annual average for 2004.

Box 2: **Quantifying the direct effects of oil prices on consumer price inflation**

Changes in oil prices directly impact on consumer price inflation via their effect on the energy component of the HICP. To gain a better understanding of the size and the speed of this direct transmission channel, several equations relating HICP energy inflation to oil prices were tested. In Equation 1 below, annual energy inflation (calculated as the year-on-year percentage change in the energy component of the HICP) is regressed on various lags of the annual change in oil prices in euro. The equation is estimated with monthly data for the 1995-2005 period and includes a correction for autocorrelation in the residuals. As the HICP energy component also covers non-oil energy products (e.g. coal), Equations 2 and 3 display similar regressions estimated for the subcomponent covering only gas and oil-related categories ('liquid fuels' and 'fuels and lubricants for personal transport equipment'), respectively. The graph below shows the lag structure of the equations.

Pass-through speed of an oil price increase



Source: Commission services.

Best fit equations (1)

(1) Energy HICP (annual % change)

Variable	Coefficient	Std. Err.	t-Stat.
Constant	1.460	0.184	7.9
Oil Price	**0.397**	**0.023**	**17.5**
Oil Price (lagged 1 month)	**0.236**	**0.023**	**10.2**
Oil Price (lagged 6 months)	**0.119**	**0.021**	**5.6**
Oil Price (lagged 12 months)	**0.109**	**0.026**	**4.1**

AR(1)= 0.64 (t = 6.6); Adjusted R^2 = 0.976; Sample monthly 1995 M2 to 2005 M10

(2) Liquid fuels HICP (annual % change)

Variable	Coefficient	Std. Err.	t-Stat.
Constant	1.472	0.413	3.5
Oil Price	**0.670**	**0.044**	**15.3**
Oil Price (lagged 1 month)	**0.491**	**0.044**	**11.1**
Oil Price (lagged 6 months)	**0.111**	**0.042**	**2.6**

AR(1)= 0.63 (8.6); Adjusted R^2 = 0.971;Sample monthly 1996 M2 to 2005 M10

(3) Gas HICP (annual % change)

Variable	Coefficient	Std. Err.	t-Stat.
Constant	2.897	1.641	1.7
Oil Price (moving avg. lagged 2-12 months)	**1.105**	**0.165**	**6.7**

AR(1)= 0.93 (17.7); Adjusted R^2 = 0.974;Sample monthly 1996 M2 to 2005 M10

(1) Oil price = year-on-year change of monthly average spot of Brent in euros.
Source: IMF and Commission services.

Analysis of the estimated equations suggests the following conclusions:

- Changes in oil prices start to feed through into energy inflation almost instantaneously and most of the transmission is achieved very rapidly. After one month, three quarters of an oil price shock is already reflected in HICP energy inflation.
- However, changes in oil prices also impact on energy prices with longer lags of about 6-12 months. These lagged effects, which remain relatively small, are likely to reflect some stickiness in the adjustment of energy prices as well as a delayed response of natural gas prices to crude oil prices. Supporting the latter interpretation is the fact that Brent prices lagged by 12 months are not a significant explanatory variable in the case of the estimation performed with the oil-related subcomponent of the HICP energy category (Equation 2) which does not cover natural gas. There is also some indication that the gas component of the HICP reacts to changes in oil prices with substantial lags of about 3-12 months (Equation 3).
- Regarding the size of the pass-through, the estimated equation suggests that a 10 euro increase in oil prices lifts energy inflation by 8.6 pp after a year, adding 0.7 pp to headline inflation. Given the lag structure of the estimated equation, the inflationary impact of an oil shock will remain visible over a period of two years but will lessen substantially after 13 months.
- Econometric results are broadly the same for the oil-related subcomponent of the HICP energy category, except that the inflationary impact of a rise in oil prices is about 50% higher than for the broader energy sector and the pass-through is somewhat faster.
- As to the short-term outlook, the equation suggests that energy inflation will begin to decelerate from early next year onwards if Brent prices remain at their current levels in euro and will have diminished considerably by the summer.

Table 7: **Direct impact of the April 2004- October 2005 oil price increase on HICP, euro area**

	Energy inflation (%) (1)	**Energy items weight** (%) (2)	**Average contribution to MS' HICP** (pp)	**Average contribution to euro-area HICP** (pp)	**Level of taxes in gasoline prices** (%) (3)	**Oil intensity** (toe/million USD) (4)
Belgium	11.7	10.2	1.16	0.039	66.0	105.3
Germany	7.9	9.9	0.78	0.227	71.5	67.1
Greece	11.8	6.9	0.80	0.022	51.7	134.2
Spain	8.8	8.7	0.78	0.088	59.4	113.9
France	8.8	8.7	0.73	0.151	71.9	67.0
Ireland	11.6	7.9	0.89	0.012	63.8	76.7
Italy	6.2	6.4	0.39	0.075	66.3	79.4
Luxembourg	15.5	11.6	1.59	0.004	59.6	130.6
Netherlands	9.2	8.6	0.79	0.041	69.2	84.1
Austria	9.9	8.2	0.76	0.024	61.5	71.6
Portugal	8.6	8.5	0.71	0.015	66.5	142.4
Finland	6.3	7.4	0.45	0.007	69.6	85.0
Euro area	8.4	8.6	0.70	0.704	67.8	80.7

(1) Average y-o-y change in energy components of the Member States' HICP.
(2) Average energy components weight in Member States' HICP in 2005.
(3) The data concerns VAT + excise duties on premium unleaded (95 octane) gasoline in 2004.
(4) Primary supply of oil expressed in millions of tonnes equivalent divided by GDP at constant prices in billions of USD in 2003.
Source: IEA and Commission services.

later, reflecting the lag with which oil prices affect natural gas prices and some stickiness in energy prices. Overall, a 10 euro increase in Brent prices leads to a pick-up in energy inflation of 8.6 pp after a year. Econometric results are broadly the same when analysing the more narrow category of liquid fuels and lubricants, except that the inflationary impact of a rise in oil prices is about twice as high as in the case of the broader energy sector and the pass-through is slightly faster. Looking forward, the estimated equations suggest that, if Brent prices in euros remain at their current level, energy inflation will begin to decelerate from early next year onwards. By next summer, the contribution of energy to headline inflation should be back to low levels.

While the recent oil price increase has had a large direct impact on inflation in the euro area as a whole, this impact differs across Member States. Table 7 suggests that energy price inflation in Luxembourg, Greece, Belgium and Ireland was most affected by the recent oil price increase, while energy inflation in Italy, Finland and Germany was least affected. The increase in the energy component of the HICP directly dented households' purchasing power by 1.6 pp in Luxembourg but by only 0.4 pp in Italy. Factors explaining the differentiated impact between Member States include differences in oil intensity across Member States as well as differences in the tax levels on the prices of oil products.[26] Local product market conditions, such as oligopolistic behaviour and the lack of competition in distribution, may also have contributed to the heterogeneity of the direct impact of the recent oil price increase.

The direct inflationary impact from the recent oil price increase in the euro area can also be compared with the impact in non-European economies. As shown in Table 8, oil-related inflation and its contribution to headline inflation were almost twice as high in the USA as in the euro area.

Country differences are explained partly by varying levels of excise duties on oil products. Differences in oil intensity, measured as oil supply divided by GDP in Table 8, also explain differences in the impact. The varying impact on prices at the consumer level can also be attributed to the fact that different grades of crude oil (with different prices) are used and refined (with different refinery costs) in the economies considered. Also, the length of oil supply contracts varies among economies and affects the impact of price changes.

[26] Fuel tourism also increases the HICP weight of fuels in Luxembourg.

Table 8: **The direct impact of the 2004 oil price increase on CPI/HICP: an international comparison**

	Euro area (1)	Japan (2)	US (3)
Oil-related CPI/HICP inflation (y-o-y change)	7.4	4.2	17.9
Weight in CPI/HICP (%)	4.3	3.0	3.5
Contribution to headline CPI/HICP (pp)	0.32	0.13	0.62
Level of taxes in gasoline prices (%) (4)	67.8	52.7	18.2
Oil intensity (toe/m USD)	80.7	52.7	89.2

(1) Oil-related HICP subcategories: 'liquid fuels' and 'lubricants and fuels for transport equipment'.
(2) Oil-related CPI subcategory: petroleum products.
(3) Oil-related CPI subcategories: fuel oil and other fuels in housing, and motor oils (lubricants and gasoline) in transportation.
(4) Premium unleaded (95 octane) gasoline for the euro area and the USA. Regular unleaded gasoline for Japan.
Source: Bureau of Labour Statistics, IEA, Statistics Bureau of Japan and Commission services.

The indirect effects

Indirect effects refer to the impact that an oil price shock, by increasing energy input costs, may have on prices of other goods and services. The size of the indirect effect depends on the oil intensity of the economy and on the extent to which firms use profit margins to absorb rising costs, i.e. on the degree of competitiveness in product markets.

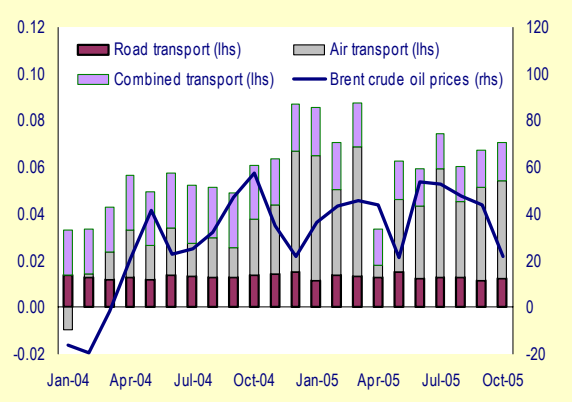
Table 9: **Correlations between Brent prices and various HICP and PPI components** (%) (1)

HICP components (weight in 2005)	**Correlation** (Jan 1995- Oct 2005)
Passenger transport by road (0.5%)	80.3
Passenger transport by air (0.5%)	77.8
Combined passenger transp. (0.5%)	80.8
PPI	**Correlation** (Jan 1990- Sept 2005)
Manufacturing	76.1
Energy	90.7
Intermediate goods	78.0

(1) Brent in EUR/bl.
Source: IMF and Commission services.

The indirect effects can be illustrated by the correlations between oil prices and the oil-related passenger transport components of HICP or producer price indexes. As seen in Table 9, the correlations are relatively strong.

Graph 32: **Contributions from HICP transport components and changes in Brent oil prices, euro area** (y-o-y in % – Jul 2003 to Oct 2005)



(1) Level of Brent oil prices in euro.
Source: IMF and Commission services.

Indirect effects tend to feed through into the economy with much longer time lags than direct effects. In addition, there is evidence that these lags vary considerably depending on the sectors considered. For instance, the first effects of a change in oil prices are felt relatively rapidly in the transport components of the HICP, i.e. passenger transport by road and by air, and combined passenger transport (see Graph 32).[27] In contrast, the indirect effect of an oil-price change on producer prices seems to take more time to materialise (approximately 4-12 months - Graph 33). It takes still longer to reach consumers.

Measuring the size of the indirect effects is difficult, as it is hard to isolate the effect of oil price changes from other cost factors such as labour costs, capital costs and input material costs. Box 3 looks further into the issue using input-output and econometric analysis. Results suggest that indirect effects on inflation can be quite significant and are probably only slightly smaller than direct effects. They tend to materialise with a substantial time lag, i.e. after more than a year, and feed through into consumer price inflation over a longer period than direct effects. Hence, they tend to prolong the direct impact of oil prices on inflation rather than to amplify it.

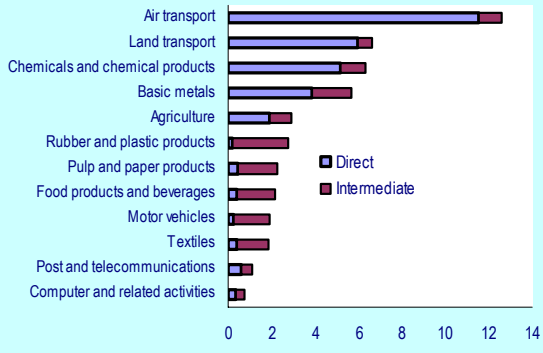
[27] However, if the first indirect effects are felt relatively rapidly in the case of transport sectors, Box 2 shows that the complete pass-through of higher oil prices can be quite slow even in these sectors.

Box 3: **Quantifying indirect effects of oil prices on consumer price inflation**

Input/output analysis

In the euro area more than half of fuel is not used for final consumption but as input for the production of goods and services. An increase in the price of fuel can therefore lead to significant indirect price effects. These occur either because individual sectors use fuels directly in the production process or because fuel is needed in the production of intermediate inputs. Input-output analysis provides a useful tool to quantify the indirect price impacts that are due to fuel as a direct and intermediate production input.

Sectoral cost exposure to higher oil prices (1)
(Oil as direct and intermediate production input
% of output value)



(1) Based on input-output table for 2000 of BE, DE, FR, IT, NL, AT and FI.
Source: Commission services.

Econometric estimates of indirect effects in the euro area (1)

(1) Core HICP (excluding energy) (annual % change)

Variable	Coefficient	Std. Err.	t-Stat.
Constant	0.11	0.07	1.71
Core HICP(lagged 1 quarter)	0.86	0.05	17.71
Unit labour costs (3-year moving average)	0.09	0.03	3.07
Output gap (lagged 1 quarter)	0.10	0.02	4.29
Real effective exchange rate (lagged 7-9 quarters)	-0.99	0.27	-3.66
Oil price change (lagged 3- 7 quarters)	**0.01**	**0.00**	**2.98**
Dummy for outlier in 1994Q1	-0.40	0.13	-3.04

Adjusted R^2 = 0.985; Sample quarterly 1991Q2 2005Q3

(2) Air transport prices (annual % change)

Variable	Coefficient	Std. Err.	t-Stat.
Constant	0.41	0.15	2.64
Air transport prices (lagged 1 month)	0.80	0.06	12.59
Oil price change (lagged 2-12- months)	**0.04**	**0.02**	**2.02**
Oil price change (lagged 13-24- months)	**0.07**	**0.02**	**2.73**

AR(1)= -0.43 (-4.9); Adjusted R^2 = 0.53; Sample monthly 1996 M03 - 2005 M09

(1) Oil price = year-on-year change of monthly average spot of Brent in euros.
Source: Commission services.

The graph in this box shows indicative examples of the differentiated cost impact oil prices have on various sectors. Not surprisingly, the most significant cost exposure can be found in transport sectors and chemical and heavy industries. Most services are relatively unaffected. Since fuels are a significant direct input for the provision of transport services (over 11% in air transport and over 6% in land transport), higher oil prices raise production costs in these sectors immediately. The transport sectors also are subject to cost increases due to induced price increases in their intermediate inputs. Compared to the direct costs of higher fuel prices, these would be relatively small. However, cost pressures from more expensive intermediate products can be substantial in some sectors, for instance in rubber and plastic production, which uses inputs from the chemicals sector. Similarly, paper and food products have relatively sizable intermediate energy inputs.

To analyse the detailed impact of an energy price increase, input-output analysis can of course only provide an indicative ranking. First, the table reflects the values for the year 2000, when fuel prices were a third lower than now. Second, the analysis only captures mechanical increases in costs, but ignores the possibility of substituting inputs to cushion the impact of a differentiated pass-through. Finally, the analysis is exclusively based on an increase in oil prices, ignoring a parallel increase in the price of other fuels, notably gas. The impact of such an increase could be of the same order of magnitude as that of oil alone.

The impact of crude oil prices on core inflation

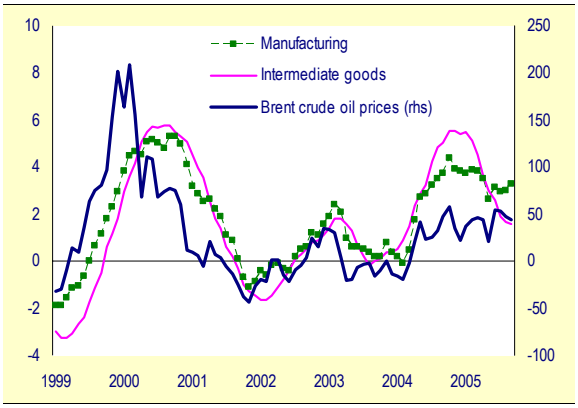
Indirect effects can be measured by estimating econometrically the determinants of core inflation. The first equation in the table above shows that much of the fluctuations in core inflation in the euro area can be explained by changes in unit labour costs (ULCs), the output gap, changes in the real effective exchange rate, and in oil prices. Most of the impact of ULCs is felt only slowly (as indicated by the size of the coefficient on the three-year moving average of ULCs). The output gap also has a positive impact on prices. Significant inflationary pressures of changes in the exchange rate and oil prices only materialise with long lags. Assuming constant unit labour costs, a 10 euro rise in Brent prices will start to be felt after a year and will lift the annual rate of core inflation by about 0.2-0.3 pp over the following three years. Comparing the results of this equation with the direct effect measured in Box 2 broadly confirms the findings of the input-output analysis regarding the relative sizes of the direct and indirect effect. The magnitudes of the two effects are broadly comparable, although the econometric estimate suggests that indirect effects may be slightly smaller than direct effects and are spread over a longer period of time. The equation explains recent developments in core inflation fairly well, suggesting that high oil prices have recently begun to push up core

inflation. These oil-related inflationary pressures have, however, been modest and offset by modest developments in unit labour costs and the lagged impact of the past euro appreciation. The effect of high oil prices on inflation could be more substantial in 2006 and could be felt until the second half of 2007.

A priori, indirect effects could be expected to take hold fastest in sectors that use fuels as a direct input while sectors that depend on energy as an intermediate input should react more slowly. However, econometric analysis shows that, even in a heavily fuel-dependent sector like air transport, the price response can be surprisingly sluggish with the bulk of the impact being felt only after two years (Equation 2). This demonstrates that the ability to pass through cost increases is often overshadowed by sector-specific constraints, such as the competitive situation or the lead time it takes to change prices.

Based on an estimated equation of core inflation, the increase in oil prices observed since 2004 has begun to exert some upward pressures on the price of non-energy related goods and services but these indirect effects have so far remained modest and have been offset by moderate growth in unit labour costs and the lagged effects of the past euro appreciation. However, the equation suggests that indirect effects could exert significant upward pressures on core inflation through 2006 even if oil prices remain at their current level.

Graph 33: **Brent oil prices and producer prices, euro area** (y-o-y in % – Jul 2003 to Oct 2005)



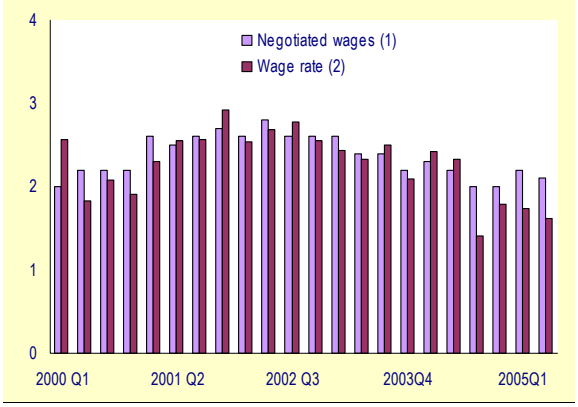
(1) Level of Brent oil prices in euro.
Source: IMF and Commission services.

Second-round effects

Second-round effects refer to the possibility that, in addition to direct and indirect effects, an oil shock may have an impact on inflation if it influences wage bargaining and price-setting behaviour. Second-round effects from an oil price increase will materialise if workers manage to obtain compensation for the associated decline in real income or if a rise in inflation expectations leads to higher outcomes in the wage bargaining process, which are then passed on to consumers.

For the euro area as a whole, there are currently no signs of a pick-up in wage inflation. Graph 34 shows recent changes in negotiated wages and the growth in the actual total wage rate as measured in national accounts. Recent developments in wages have remained quite benign, with, in particular, actual wage inflation showing a mild downward trend since the beginning of the year. This suggests that the current economic context, in particular weak labour market conditions, is exerting downward pressure on wage claims.

Graph 34: **Negotiated wage and wage rate, euro area** (y-o-y changes in % – 2000Q1 to 2005Q2)

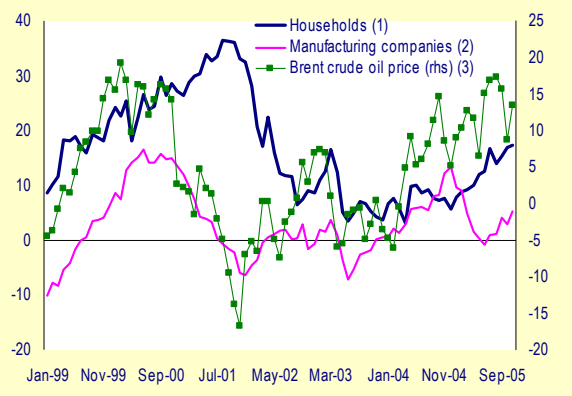


(1) ECB's indicator of negotiated wages.
(2) Wage bill divided by total salaried employment, NIA.
Source: ECB and Commission services.

Wage data are only available up to the second quarter of the year. For a more up-to-date assessment of possible second-round effects, it is therefore important to analyse more recent data on inflation expectations. The European Commission and the ECB provide survey data on short-term price or inflation expectations in the euro area. Both surveys indicate that,

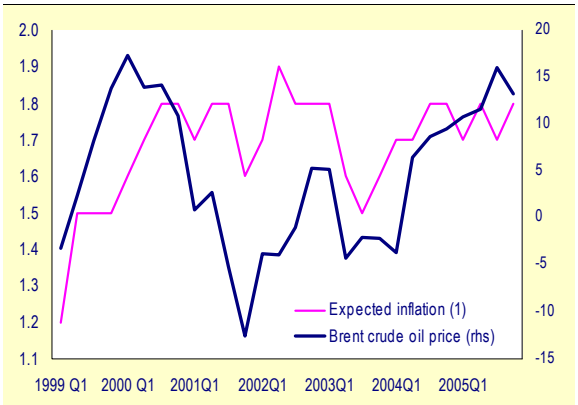
although the rise in oil prices since the beginning of 2004 has not left inflation expectations unaffected, its impact has remained limited.

Graph 35: **Expected prices in Commission surveys and Brent oil prices** (Jan 1999 to Nov 2005)



(1) Price trends over next 12 months – net balance in %.
(2) Selling price expectations for months ahead–net balance in %.
(3) Y-o-y changes in Brent oil prices in euro.
Source: Commission services.

Graph 36: **Expected inflation in the ECB survey and Brent oil prices** (1999Q1 to 2005Q2)

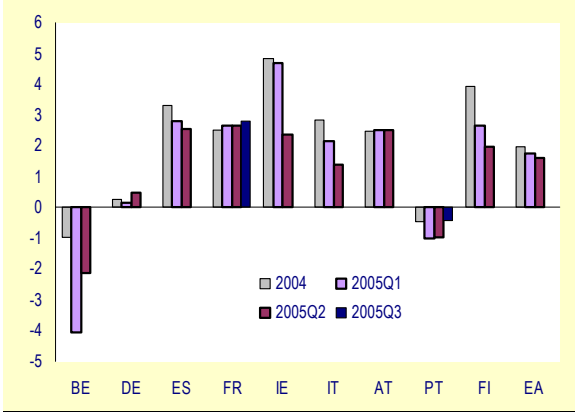


(1) Average forecast in the ECB's Survey of Professional Forecasters, euro-area HICP inflation rate one year ahead.
(2) Y-o-y changes in Brent oil prices in euro.
Source: ECB and Commission services.

The *European Commission surveys* show that the short-term price expectations of both consumers and manufacturers are generally affected by large fluctuations in oil prices. However, the rise in expectations since the beginning of the euro has remained fairly contained and more modest than during the previous oil shock of 1999-2000 (Graph 35). This is particularly true in the manufacturing sector, where the past appreciation of the euro and increased international competition seem to have dampened price expectations.

Data on inflation expectations from the *ECB Survey of Professional Forecasters* (SPF) also seem to be influenced by oil price developments (Graph 36). Nevertheless, the acceleration of oil prices in 2004-05 has not pushed short-term inflation expectations above the ECB medium-term objective of an inflation rate of close to, but below, 2%. Expectations have remained contained in a narrow band since the beginning of 2004. Similarly, long-term inflationary expectations based on French index-linked bonds have also changed little and remained close to 2%.

Graph 37: **Wage inflation in some euro-area Member States** (1) (y-o-y % change)

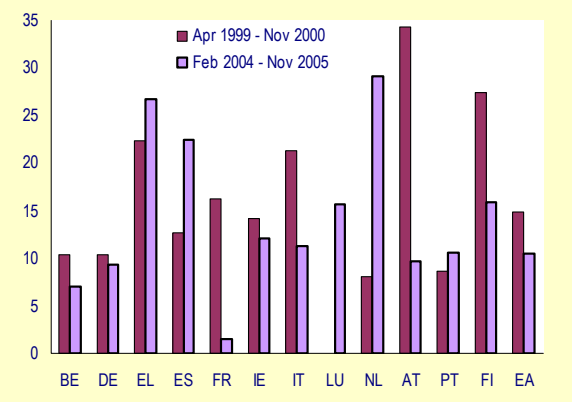


(1) Wage data cover the entire economy for DE, ES, FR, IT, AT and FI (excl. agriculture in the case of FR) but only industry for BE and IE, and manufacturing for PT.
Source: EcoWin and Commission services.

Overall, data on wages and inflation expectations suggest that second-round effects are presently absent in the euro area as a whole. Is there any empirical evidence so far of second-round effects in the individual euro-area Member States? Graph 37 shows the development of wage inflation in some of the euro-area Member States in 2004 and the first two (three) quarters of 2005. In 2005, total-economy wage inflation has so far fallen in Spain, Italy and Finland, while it has been almost unchanged in Austria. There has been a very mild pick-up in wage inflation for the total economy in Germany and France, but in Germany the level of wage inflation remains extremely low. For some of the other Member

States total-industry wage data can be looked into in the absence of data for the economy as a whole. In 2005, industry wage inflation has so far either decelerated sharply compared to 2004 (Ireland) or remained negative (Belgium and Portugal).

Graph 38: **Changes in households' price expectations during the last two oil price shocks, euro-area Member States** (1) (2)(net balance – change in pp)

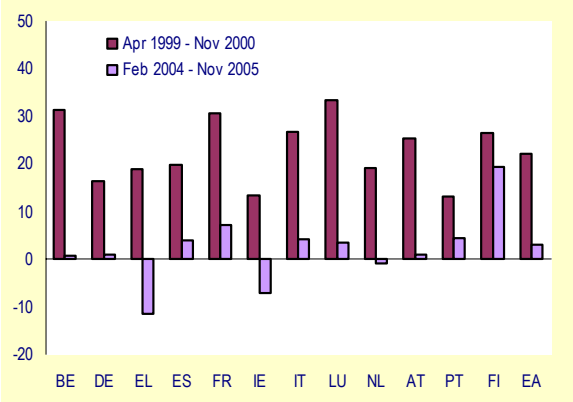


(1) Changes in the three-month moving averages.
(2) Data are not available for LU before January 2002.
Source: Commission services.

Turning to developments in inflation expectations at the Member State level, Graph 38 displays a comparison of changes in households' assessment of price trends in the next 12 months (household survey of the European Commission) between 1999-2000 and 2004-05 oil price shocks. For the two shocks, the change in price expectations is calculated for a period during which the rise in Brent prices was similar (about 20 euros) although starting from different initial levels. For a majority of Member States, the rise in inflation expectations among households has been lower in the current oil price shock than during its predecessor. However, a somewhat stronger increase in price expectations at the current juncture has been registered in the Netherlands and Spain and, to a lesser degree, in Greece. These three countries have also reported far larger increases in price expectations since the beginning of 2004 than the rest of the euro area.

In Graph 39, a similar comparison between the oil-price shocks is performed, but for manufacturers' selling price expectations for the months ahead (manufacturing survey of the European Commission). The rise in the inflation expectations of euro-area manufacturing companies has been much smaller during the current oil price shock than during its predecessor. In several Member States manufacturing companies' inflation expectations have even fallen since the beginning of 2004. Factors, such as globalisation and increased competition among manufacturing companies, could explain this disconnection between manufacturers' and households' price expectations.

Graph 39: **Changes in manufacturing companies' price expectations during the last two oil shocks, euro-area Member States** (1) (net balance – change in pp)



(1) Changes in three-month moving averages.
Source: Commission services.

Overall, both wage and price expectation data paint a benign picture of wage developments in most euro-area Member States. Risks of significant second-round wage effects appear, at the moment, to be limited. However, these risks might be somewhat higher in those few Member States where the labour market appears relatively tight and where workers' price expectations have increased noticeably in recent months (Greece and Spain). In addition, wage bargaining systems may respond more strongly to rising oil prices in some Member States due to wage indexation practices. Wage indexation is present in a formal or a more informal way in many Member States. There is automatic wage indexation in Belgium and Luxembourg. In addition, wage indexation clauses are common in collective wage agreements in Spain, Finland, Greece and the Netherlands. In these countries, indexation generally takes the form of additional wage increases when inflation exceeds certain

Table 10: **The impact of a 50% permanent increase in oil prices on euro-area inflation and real GDP growth – Simulation results from some macroeconomic models.**

Study - Model name	Inflation			Real GDP growth		
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
European Commission (2005) – QUEST	0.5	0.5	0.0	-0.6	-0.3	-0.2
Ades et al (2004) - Goldman Sachs Oil Gage Model	0.7	0.3	--	-0.7	-0.8	--
Barrell and Pomerantz (2004) – NIESR – NiGEM	0.3	0.2	0.0	-0.8	0.0	0.1
Dieppe and Henry (2004) – ECB AWM	0.5	0.4	0.1	-0.1	-0.2	-0.1
IEA (2004) – Interlink model	0.6	0.7	--	-0.6	-0.6	--

Note: -- indicates that no results are reported. The original results in the studies by Ades et al, Barrell and Pomerantz, and IEA are based on 10, 20, and 40% oil price rises, respectively. Assuming linearity, these results have been adjusted to a 50% oil price increase.

Source: Commission services –Ades, A, Fuentes, M, Sharenow, G and M. Vaknin (2005), "Is there Life after $60/bbl?", Global Viewpoint, Issue No: 05/05, 23 March, Goldman Sachs – Barrell, R and O. Pomerantz (2004), "Oil prices and the world economy", NIESR Discussion Paper, No. 242 – Dieppe, A and J. Henry (2004), "The euro area viewed as a single economy: How does it respond to shocks?", Economic Modelling, 21, pp. 833-875 – IEA (2004), "Analysis of the Impact of High Oil Prices on the Global Economy", IEA Energy Papers, May.

thresholds. In Italy, negotiated wages can be adjusted ex-post in case of inflation surprises. Finally, indexation of minimum wages is present in several Member States. Formal or informal indexation of statutory minimum wages exists in Belgium, France, Greece and Luxembourg, while there is formal indexation of collectively agreed minimum wages in Italy. In Spain and Germany, inflation is one of the criteria used to adjust statutory or collectively agreed minimum wages.

3. The impact of oil prices on inflation: overall assessment

Any assessment of the overall impact of changes in oil prices is complicated by the fact that there can be strong interactions between the three channels discussed in the previous section and developments in the real economy. In particular, a rise in oil prices may fuel wage inflation if workers try to recoup losses in purchasing power. However, it will also dampen domestic demand as the associated terms of trade loss must inevitably be assumed by domestic households or corporations. The resulting weakening of activity will tend to exert downward pressure on wages.

Due to the existence of such interactions, an overall quantitative assessment of the inflationary impact of an increase in oil prices can only be made via model simulations. Table 10 displays the results of simulations carried out with various macroeconometric models, including DG ECFIN's QUEST model.[28] It provides estimates of the inflation and growth impact of a 50% permanent increase in oil prices. This corresponds broadly to the increase in the euro price of a barrel of Brent observed since the beginning of 2005.

The simulations carried out with DG ECFIN's QUEST model suggest that a permanent 50% oil price increase adds about 0.5 pp to consumer price inflation during the two years following the shock.[29] The inflationary effect fades after three years. Wage moderation prevails and second-round effects are small as the shock also has a significant negative effect on GDP growth that depresses wages. Other simulations shown in the table provide a similar broad picture, although the smaller inflation effect in the NiGEM model and the larger one in the Interlink model suggest that the range of uncertainty associated with the simulation exercise is significant. Any comparison between simulations carried out with different models should in any case be considered with extreme care, as differences in

[28] For other overviews of recent model simulation results, see ECB (2004), 'Oil prices and the euro-area economy', Annual Report 2004, April; and Schneider, M. (2004), 'The impact of oil price changes on growth and inflation', Monetary Policy & the Economy, Q2/04, Oesterreichische Nationalbank, Vienna.

[29] When interpreting the results of simulations, it should be borne in mind that, in most models (including QUEST), inflation is measured by the consumption deflator rather than the HICP. The consumption deflator covers a significantly broader range of goods and services than the HICP. As a result, the weight of oil products in total inflation is substantially smaller for consumption deflator inflation than for HICP inflation.

estimated impact may reflect differences in modelling assumptions and strategies.

Overall, three main conclusions can be drawn from the analysis presented in this focus.

First, the rise in oil prices registered over the past two years has already had a significant effect on the energy component of the HICP. If oil prices are maintained at the current level, this direct effect should fade progressively during the course of 2006.

Second, changes in oil prices have begun to exert some indirect effects on core inflation as producers have started to pass through higher input costs into their final prices. These indirect effects, which are usually slow to materialise, have so far remained modest but could result in significant upward pressures on inflation in the euro area in the year ahead.

Finally, inflationary pressures from oil prices have been partly offset so far by other factors like modest unit labour costs developments and the lagged impact of the past euro appreciation. Second-round wage effects have so far remained muted. Both wage and inflation expectations data show that the euro-area economy is not responding more strongly to the current oil price shock than to its predecessor of 1999-2000. If anything, a weaker cyclical position and a looser labour market should allow an even softer response of wages to soaring oil prices than in 1999-2000. There is a risk that second-round effects may be less benign in some Member States where the response of wages to higher oil prices may be amplified by a relatively tight labour market or the existence of wage-indexation schemes. Available data on inflation expectations suggest, however, that this risk is currently low.

IV. Recent DG ECFIN publications

1. Policy documents

EUROPEAN ECONOMY. No. 3. 2005
Public finances in EMU –2005
http://europa.eu.int/comm/economy_finance/publications/publicfinance_en.htm

EUROPEAN ECONOMY. No. 5. 2005
Economic Forecasts, Autumn 2005 - 2007: growth picks up
http://europa.eu.int/comm/economy_finance/publications/european_economy/forecasts_en.htm

EUROPEAN ECONOMY. No. 6. 2005
The EU Economy 2005 Review
http://europa.eu.int/comm/economy_finance/publications/european_economy/the_eu_economy_review_en.htm

EUROPEAN ECONOMY. OCCASIONAL PAPERS. No.18. April 2005
European Neighbourhood Policy: Economic Review of ENP Countries
http://europa.eu.int/comm/economy_finance/publications/occasional_papers/occasionalpapers18_en.htm

EUROPEAN ECONOMY. OCCASIONAL PAPERS. No.19. November 2005
The 2005 EPC projection of age-related expenditure: Agreed underlying assumptions and projection methodologies
http://europa.eu.int/comm/economy_finance/publications/occasional_papers/occasionalpapers19_en.htm

EUROPEAN ECONOMY. OCCASIONAL PAPERS. No.20. November 2005
Consumption, investment and saving in the EU: an assessment
http://europa.eu.int/comm/economy_finance/publications/occasional_papers/occasionalpapers20_en.htm

EUROPEAN ECONOMY. SPECIAL REPORT. No. 1. 2005
The contribution of wage developments to labour market performance
http://europa.eu.int/comm/economy_finance/publications/european_economy/2005/eespecialreport0105_en.htm

EUROPEAN ECONOMY. SPECIAL REPORT. No. 3. 2005
Labour market and wage developments in 2004, with special focus on risk of jobless growth
http://europa.eu.int/comm/economy_finance/publications/european_economy/2005/eespecialreport0305_en.htm

EUROPEAN ECONOMY. SPECIAL REPORT. No. 4. 2005
The 2005 EPC projections of age-related expenditure (2004-2050) for the EU-25 Member States: underlying assumptions and projection methodologies
http://europa.eu.int/comm/economy_finance/publications/european_economy/2005/eespecialreport0405_en.htm

2. Analytical documents

EUROPEAN ECONOMY. ECONOMIC PAPERS. No. 228.
Michael R. Bryan (Federal Reserve Bank of Cleveland) and Stefan Palmqvist (Sveriges Riksbank)
Testing near-rationality using detailed survey data
http://europa.eu.int/comm/economy_finance/publications/economic_papers/economicpapers228_en.htm

EUROPEAN ECONOMY. ECONOMIC PAPERS. No. 229.
Salvador Barrios (Directorate-General for Economic and Financial Affairs) and Eric Strobl (Ecole Polytechnique, Paris)
The dynamics of regional inequalities
http://europa.eu.int/comm/economy_finance/publications/economic_papers/economicpapers229_en.htm

EUROPEAN ECONOMY. ECONOMIC PAPERS. No. 230.
Heikki Oksanen (Directorate-General for Economic and Financial Affairs)
Actuarial neutrality across generations applied to public pensions under population ageing: effects on government finances and national saving
http://europa.eu.int/comm/economy_finance/publications/economic_papers/economicpapers230_en.htm

EUROPEAN ECONOMY. ECONOMIC PAPERS. No. 231.
David R Collie (Cardiff Business School, Cardiff University)
State aid to investment and R&D
http://europa.eu.int/comm/economy_finance/publications/economic_papers/economicpapers231_en.htm

EUROPEAN ECONOMY. ECONOMIC PAPERS. No. 232.
Gilles Mourre (Directorate General for Economic and Financial Affairs)
Wage compression and employment in Europe: First evidence from the structure of earnings survey 2002
http://europa.eu.int/comm/economy_finance/publications/economic_papers/economicpapers232_en.htm

EUROPEAN ECONOMY. ECONOMIC PAPERS. No. 233.
Carlos Martinez-Mongay (Directorate-General for Economic and Financial Affairs) and Khalid Sekkat (University of Brussels)
Progressive taxation, macroeconomic stabilization and efficiency in Europe
http://europa.eu.int/comm/economy_finance/publications/economic_papers/economicpapers233_en.htm

EUROPEAN ECONOMY. ECONOMIC PAPERS. No. 234.
Filip Keereman (Directorate-General for Economic and Financial Affairs)
Economic forecasts and fiscal policy in the recently acceded Member States
http://europa.eu.int/comm/economy_finance/publications/economic_papers/economicpapers234_en.htm

EUROPEAN ECONOMY. ECONOMIC PAPERS. No. 235.
Giuseppe Carone (Directorate-General for Economic and Financial Affairs)
Long-term labour force projections for the 25 EU Member States: A set of data for assessing the economic impact of ageing
http://europa.eu.int/comm/economy_finance/publications/economic_papers/economicpapers235_en.htm

EUROPEAN ECONOMY. ECONOMIC PAPERS. No. 237.
Lars Jonung (Directorate-General for Economic and Financial Affairs), Ludger Schuknecht and Mika Tujula (ECB)
The boom-bust cycle in Finland and Sweden 1984-1995 in an international perspective
http://europa.eu.int/comm/economy_finance/publications/economic_papers/economicpapers237_en.htm

EUROPEAN ECONOMY. ECONOMIC PAPERS. No. 238.
Alfonso Arpaia and Gilles Mourre (Directorate-General for Economic and Financial Affairs)
Labour market institutions and labour market performance: A survey of the literature
http://europa.eu.int/comm/economy_finance/publications/economic_papers/economicpapers238_en.htm

3. Regular publications

Euro area GDP indicator (Indicator-based forecast of quarterly GDP growth in the euro area)
http://europa.eu.int/comm/economy_finance/indicators/euroareagdp_en.htm

Business and Consumer Surveys (harmonised surveys for different sectors of the economies in the European Union (EU) and the applicant countries)
http://europa.eu.int/comm/economy_finance/indicators/businessandconsumersurveys_en.htm

Business Climate Indicator for the euro area (monthly indicator designed to deliver a clear and early assessment of the cyclical situation)
http://europa.eu.int/comm/economy_finance/indicators/businessclimate_en.htm

Key indicators for the euro area (presents the most relevant economic statistics concerning the euro area)
http://europa.eu.int/comm/economy_finance/indicators/key_euro_area/keyeuroarea_en.htm

Monthly and quarterly notes on the euro-denominated bond markets (looks at the volumes of debt issued, the maturity structures, and the conditions in the market)
http://europa.eu.int/comm/economy_finance/publications/bondmarkets_en.htm

Price and Cost Competitiveness
http://europa.eu.int/comm/economy_finance/publications/priceandcostcompetiteveness_en.htm

V. Key indicators for the euro area

1 Output		2002	2003	2004	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05
Industrial confidence [1.1]	Balance	-12	-11	-5	-10	-8	-8	-7	-6	-6
Industrial production [1.2]	mom % ch	-0.7	0.5	2.0	0.5	0.1	0.8	-0.4		
		2002	2003	2004	04Q2	04Q3	04Q4	05Q1	05Q2	05Q3
Gross domestic product [1.3]	Qtr. % ch				0.4	0.3	0.2	0.3	0.4	0.6
2 Private consumption		2002	2003	2004	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05
Consumer confidence [2.1]	Balance	-11	-18	-14	-15	-15	-15	-15	-13	-13
Retail sales [2.2]	mom % ch	1.1	0.1	0.2	0.0	-0.7	0.7	-0.4		
		2002	2003	2004	04Q2	04Q3	04Q4	05Q1	05Q2	05Q3
Private consumption [2.3]	Qtr. % ch	0.6	1.1	1.6	0.1	0.2	0.8	0.2	0.2	0.3
3 Investment		2002	2003	2004	04Q2	04Q3	04Q4	05Q1	05Q2	05Q3
Capacity utilization [3.1]	%	81.2	80.7	81.6	81.1	82.0	82.1	81.9	81.2	81.2
Gross fixed capital formation [3.2]	Qtr. % ch	-2.0	0.9	2.3	0.2	0.4	0.6	0.1	0.8	1.6
Change in stocks [3.3]	% of GDP	-0.1	0.0	-0.1	-0.2	0.1	0.1	0.0	0.1	0.1
4 Labour market		2002	2003	2004	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05
Unemployment [4.1]	%	8.2	8.4	8.9	8.6	8.5	8.4	8.3	8.3	
		2002	2003	2004	04Q2	04Q3	04Q4	05Q1	05Q2	05Q3
Employment [4.2]	Ann. % ch	0.7	0.3	0.7	0.6	0.7	0.8	0.6	0.6	
Shortage of labour [4.3]	%	3.8	2.5	2.4	2.6	2.4	2.2	2.3	2.4	
Wages [4.4]	Ann. % ch	2.9	2.5	2.2	2.3	2.0	2.0	2.2		
5 International transactions		2002	2003	2004	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05
Export order books [5.1]	Balance	-22	-24	-13	-20	-18	-18	-17	-15	-14
World trade [5.2]	Bn. EUR	125	132		157	156	160			
Exports of goods [5.3]	Bn. EUR	776.9	1038.6	1142.1	100.5	103.0	106.7	107.0		
Imports of goods [5.4]	Bn. EUR	781.6	970.4	1069.1	97.1	102.0	106.5	105.8		
Trade balance [5.5]	Bn. EUR	-4.7	68.2	73.0	3.4	1.0	0.2	1.2		
		2002	2003	2004	04Q2	04Q3	04Q4	05Q1	05Q2	05Q3
Exports of goods and services [5.6]	Qtr. % ch	2.1	0.6	5.9	2.7	1.3	0.5	-0.5	1.8	
Imports of goods and services [5.7]	Qtr. % ch	0.5	2.6	6.1	2.7	2.5	1.4	-1.4	2.3	
		2002	2003	2004	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05
Current account balance [5.8]	Bn. EUR	44.9	18.1	42.1	-0.4	-4.7	-6.6	-4.5		
Direct investment (net) [5.9]	Bn. EUR	-11.0	-18.4	-39.7	-9.9	-80.1	-15.0	2.1		
Portfolio investment (net) [5.10]	Bn. EUR	64.4	-9.4	39.0	102.6	73.7	-19.5	13.9		
6 Prices		2002	2003	2004	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05
HICP [6.1]	Ann. % ch	2.3	2.1	2.2	2.1	2.2	2.2	2.6	2.5	2.4
Core HICP [6.2]	Ann. % ch	2.5	2.0	2.1	1.4	1.4	1.4	1.5	1.5	
Producer prices [6.3]	Ann. % ch	1.7	1.6	2.3	4.0	4.1	4.0	4.4		
Import prices[6.4]	Ann. % ch	97.9	102.5	97.2	103.9	106.8	109.0			
7 Monetary and financial indicators		2002	2003	2004	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05
Interest rate (3 months) [7.1]	% p.a.	3.3	2.3	2.1	2.1	2.1	2.1	2.1	2.2	2.4
Bond yield (10 years) [7.2]	% p.a.	4.8	4.1	4.1	3.2	3.2	3.3	3.1	3.3	3.5
ECB repo rate [7.3]	% p.a.	3.25	2.75	2.00	2.00	2.00	2.00	2.00	2.00	2.25
Stock markets [7.4]	Index	3053	2420	2805	3152	3268	3303	3352	3344	3405
M3 [7.5]	Ann. % ch	5.6	7.8	5.9	7.6	7.9	8.2	8.2		
Credit to private sector (loans) [7.6]	Ann. % ch	7.7	5.0	6.0	8.0	8.3	8.4	8.6	8.8	
Exchange rate USD/EUR [7.7]	Value	0.95	1.13	1.24	1.22	1.20	1.23	1.23	1.20	1.18
Nominal effective exchange rate [7.8]	Index	95.1	106.4	109.8	107.6	108.3	109.1	108.5	108.2	107.6

Number	Indicator	Note	Source
1	**Output**		
1.1	Industrial confidence indicator	Industry survey, average of balances to replies on production expectations, order books, and stocks (the latter with inverted sign)	ECFIN
1.2	Industrial production	Volume, excluding construction, wda	Eurostat
1.3	Gross domestic product	Volume (1995), seasonally adjusted	Eurostat
2	**Private consumption**		
2.1	Consumer confidence indicator	Consumer survey, average of balances to replies on four questions (financial and economic situation, unemployment, savings over next 12 months)	ECFIN
2.2	Retail sales	Volume, excluding motor vehicles, wda	Eurostat
2.3	Private consumption	Volume (1995 prices), seasonally adjusted	Eurostat
3	**Investment**		
3.1	Capacity utilisation	In percent of full capacity, manufacturing, seasonally adjusted, survey data (collected in each January, April, July and October).	ECFIN
3.2	Gross fixed capital formation	Volume (1995 prices), seasonally adjusted	Eurostat
3.3	Change in stocks	In percent of GDP, volume (1995 prices), seasonally adjusted	Eurostat
4	**Labour market**		
4.1	Unemployment	In percent of total workforce, ILO definition, seasonally adjusted	Eurostat
4.2	Employment	Number of employees, partially estimated, seasonally adjusted	ECB/ Eurostat
4.3	Shortage of labour	Percent of firms in the manufacturing sector reporting a shortage of labour (unfilled job openings) as a constraint to production, seasonally adjusted	ECFIN
4.4	Wages	Not fully harmonised concept, but representative for each Member State (mostly hourly earnings)	ECFIN
5	**International transactions**		
5.1	Export order books	Industry survey; balance of positive and negative replies, seasonally adjusted	ECFIN
5.2	Exports of goods	Bn. EUR, excluding intra euro-area trade, fob	Eurostat
5.3	Imports of goods	Bn. EUR, excluding intra euro-area trade, cif	Eurostat
5.4	Trade balance	Bn. EUR, excluding intra euro-area trade, fob-cif	Eurostat
5.5	Exports of goods and services	Volume (1995 prices), including intra euro-area trade, seasonally adjusted	Eurostat
5.6	Imports of goods and services	Volume (1995 prices), including intra euro-area trade, seasonally adjusted	Eurostat
5.7	Current account balance	Bn. EUR, excluding intra euro-area transactions; before 1997 partly estimated	ECB
5.8	Direct investment	(net) Bn. EUR, excluding intra euro-area transactions	ECB
5.9	Portfolio investment	(net) Bn. EUR, excluding intra euro-area transactions	ECB
6	**Prices**		
6.1	HICP	Harmonised index of consumer prices	Eurostat
6.2	Core HICP	Harmonised index of consumer prices, excluding energy and unprocessed food	Eurostat
6.3	Producer prices	Without construction	Eurostat
6.4	Import prices	Import unit value index for goods	Eurostat
7	**Monetary and financial indicators**		
7.1	Interest rate	Percent p.a., 3-month interbank money market rate, period averages	Ecowin
7.2	Bond yield	Percent p.a., 10-year government bond yields, lowest level prevailing in the euro area, period averages	Ecowin
7.3	ECB repo rate	Percent p.a., minimum bid rate of the ECB, end of period	Ecowin
7.4	Stock markets	DJ Euro STOXX50 index, period averages	Ecowin
7.5	M3	Seasonally adjusted moving average moving average (3 last months)	ECB

7.6	Credit to private sector (loans)	MFI loans to euro-area residents excluding MFIs and general government, monthly values: month end values, annual values: annual averages	ECB
7.7	Exchange rate USD/EUR	Period averages	ECB
7.8	Nominal effective exchange rate	Against 13 other industrialised countries, double export weighted, 1995 = 100, increase (decrease): appreciation (depreciation)	ECFIN

Contributors to this issue are:

Recent economic developments and short-term prospects	*C. Brzeski, O. Grevesmuhl, G. Lejeune, D. Paternoster and S. Sorensen*
A bond yield conundrum in the euro area?	*R. Albers and C. Brzeski*
Focus: Ageing populations in the euro area: what is the impact on employment and growth?	*G. Mourre*
Focus: The impact of higher oil prices of inflation	*K. Friberg and H. Jansen*
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