2 Business investment developments in the euro area since the crisis

Business investment is both an important driver of the business cycle and a determinant of future growth prospects. While recovering less than in other advanced economies, the ratio of euro area real business investment to value added has recently surpassed its historical average. The recovery in investment is being driven by a combination of improving demand, profit expectations and financing conditions, as well as declining uncertainty. However, weak absolute investment growth in the euro area has slowed growth of the capital stock, which has weighed on potential and productivity growth since the crisis. Moreover, euro area gross corporate debt remains historically high and several regulatory and institutional factors continue to drag on business investment, despite a number of reforms in recent years. At this stage, policies aimed at improving the regulatory environment and credit conditions, reducing entry barriers, increasing the overall flexibility of labour and product markets and providing an efficient debt restructuring framework are particularly important for fostering investment. Finally, targeted and efficient infrastructure investment can support business investment.

Stylised facts on business investment

Investment is a key driver of the business cycle and determines future growth prospects. As an important expenditure component of GDP, making up about 20%, real investment, through cyclical swings, drives the business cycle. Investment decisions also crucially determine the capital stock and hence potential growth[1]. Without sufficient investment, the capital stock cannot be renewed regularly, impeding technological progress and hindering structural change in the economy as a whole. Investment – and primarily business investment (proxied by real non-construction investment, see Box 1) – also increases the productive capacity of labour by boosting capital deepening.
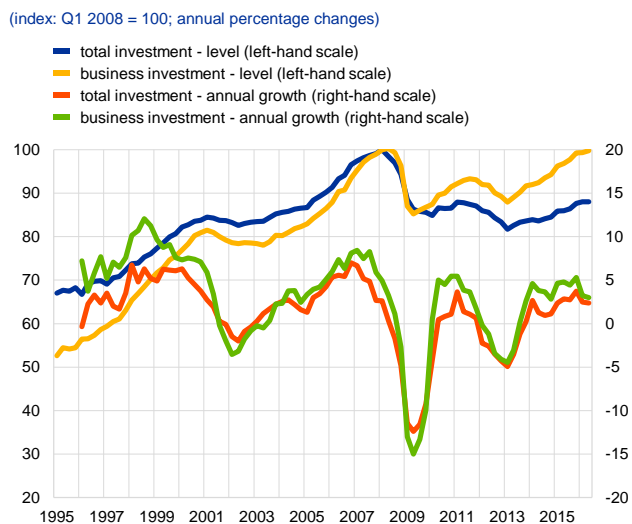
This article focuses on the recovery in euro area real business investment over the past three years, assessing its drivers and the policy responses required in order to improve investment conditions. Following a period of substantial contraction during the crisis, real business investment has recovered visibly since early 2013 (see Chart 1). The strong fall in euro area total investment witnessed during the Great Recession and the decline in investment in 2011-12 were the consequences of lower business investment, but also a strong downward correction in overheating housing markets and persisting budgetary constraints that resulted in lower construction and public investment in some countries. The general

---

[1] See Anderton, R., Aranki, T., Dieppe, A., Elding, C., Haroutunian, S., Jacquinot, P., Jarvis, V., Labhard, V., Rusinova, D. and Szörfi, B., "Potential output from a euro area perspective", *Occasional Paper Series,* No 156, ECB, Frankfurt am Main, November 2014.

increase recorded in total fixed capital formation since early 2013 has been driven by non-construction investment, while construction investment started to rise only in 2015 (see Chart 2). In recent quarters, real investment – and primarily business investment – has become an important driver of the euro area recovery in addition to private consumption.

Chart 1

Real total and business investment in the euro area

(index: Q1 2008 = 100; annual percentage changes)

- total investment - level (left-hand scale)
- business investment - level (left-hand scale)
- total investment - annual growth (right-hand scale)
- business investment - annual growth (right-hand scale)

Sources: Eurostat and ECB calculations.
Notes: The latest observation is for the second quarter of 2016. Real business investment refers to non-construction investment.

Chart 2

Breakdown of real total investment in the euro area
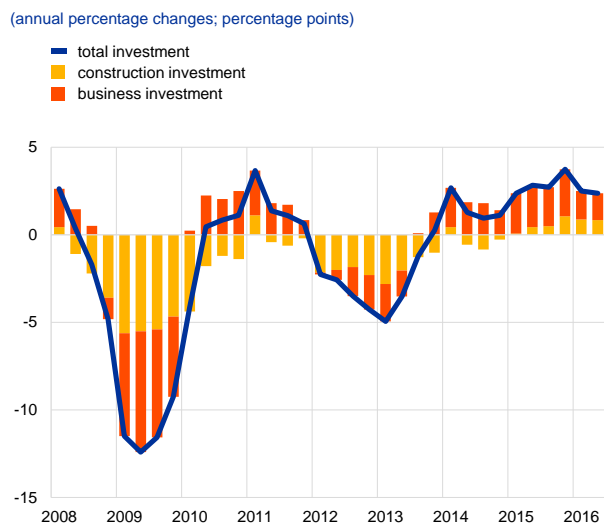
(annual percentage changes; percentage points)

- total investment
- construction investment
- business investment

Sources: Eurostat and ECB calculations.
Notes: The latest observation is for the second quarter of 2016. Real business investment refers to non-construction investment.

Box 1

Data on real business investment and capital stock in the euro area

Non-construction investment values, calculated from Eurostat national accounts data, are used as a proxy for business investment in this article. Total investment values are available from the quarterly national accounts, released by Eurostat, for the euro area and its member countries, where total investment is also available broken down by main asset classes at a quarterly frequency. Adjusting total investment for construction (i.e. dwellings and non-residential investment), the resulting non-construction investment covers (i) machinery, equipment and weapons systems, (ii) intellectual property products and (iii) agricultural products. The first component is, in turn, made up of transport investment, information and communication technology (ICT) equipment, other machinery and equipment, and weapons systems. However, the latter two components are not mandatory for the European national statistical institutes to report under the ESA 2010 transmission programme and hence relevant data are not available for the euro area and most countries at a quarterly frequency. Better data availability exists at an annual frequency, although it is not sufficiently frequent for the analysis presented in this article. From a sectoral perspective, Eurostat does not compute quarterly real business investment in the national accounts, as official sector investment data by main asset classes are only available in value terms on a quarterly basis. Moreover, total investment by government and by non-financial companies is currently only expressed in nominal – and predominantly – non-seasonally adjusted terms. The OECD computes private non-residential investment for many, but not all, OECD countries. For reasons of data availability, this article will mostly use real non-construction investment data

computed from total investment data adjusted for construction investment released by Eurostat, as a proxy for real business investment[2].

Data on the capital stock for the whole economy, available from the European Commission (AMECO), are used in this article. Data on the capital stock for the whole economy generally become available with a lag of at least two years and are available in annual terms from Eurostat based on data collected from national statistical institutes. The European Commission (AMECO) also computes annual data on total economy net capital stock using the "perpetual inventory" method, whereby the capital stock of the previous year is taken and that part of the stock that has reached the end of its service life is subtracted (depreciation), together with the retirement rate, and the gross fixed capital formation in the current year is added. AMECO data are used in this article.

Euro area business investment is now back to the pre-crisis peak recorded in 2008, while business investment in other advanced economies has recovered more markedly (see Chart 3). In the euro area, business investment declined in 2008 and again from 2011. Its recovery began in 2013, albeit with lower average growth rates than observed in the period prior to the crisis. In the United Kingdom and the United States, the trough in investment was recorded in 2009. There is also heterogeneity across euro area countries. Of the almost 15% increase in the level of business investment observed in the euro area since the trough, Germany, Spain and France have contributed considerably, while there was a limited contribution from Italy (see Chart 4).

Chart 3

Real business investment levels in selected advanced economies

(index: Q1 2008 = 100)

euro area / Germany / France / Italy / Spain / United States / United Kingdom
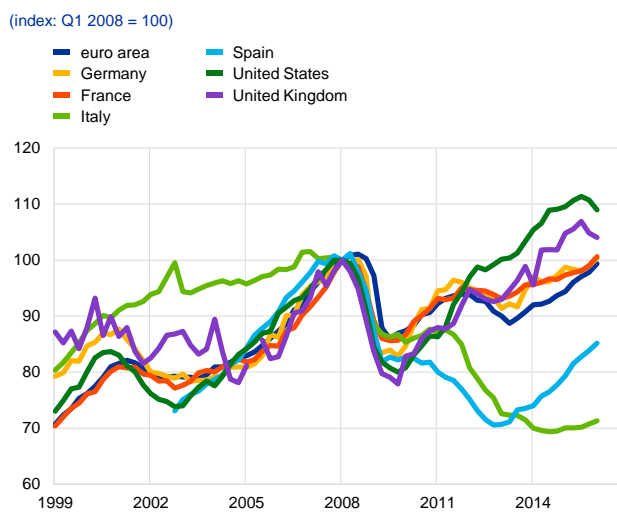
Sources: OECD and Eurostat (euro area).
Notes: The latest observation is for the second quarter of 2016. All OECD business investment series refer to private non-residential investment, except for series for Spain and Italy, which include government investment.

Chart 4

Contributions to euro area real business investment dynamics from the euro area countries
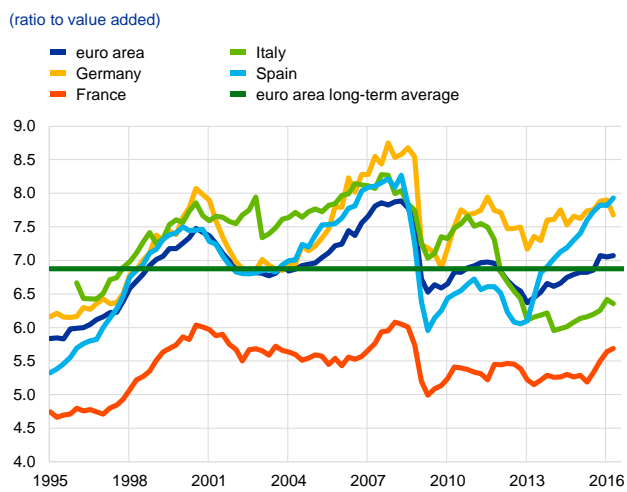
(percentages; percentage points)

euro area / Germany / France / Italy / Spain / Netherlands / others
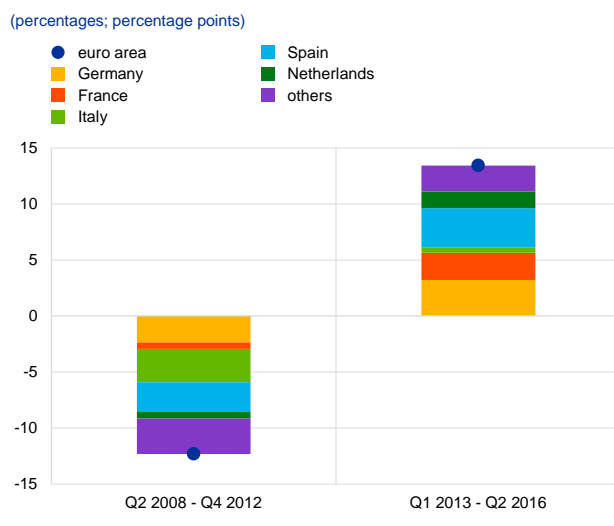
Source: Eurostat.

---

[2]   Non-construction investment would then contain a limited share of public investment (about 10% of total investment, with some variation across countries).

Chart 5

Ratio of real business investment to value added in the euro area and the largest euro area countries

(ratio to value added)

- euro area
- Germany
- France
- Italy
- Spain
- euro area long-term average

[Chart: line graph with y-axis from 4.0 to 9.0 and x-axis years 1995, 1998, 2001, 2004, 2007, 2010, 2013, 2016]

Source: Eurostat and ECB calculations.
Notes: The latest observation is for the second quarter of 2016. The long-term average ratio calculated over the period is 6.9. Business investment is proxied by investment in machinery, equipment and weapons systems (the latter cannot be deducted).

The ratio of euro area real business investment to value added has now surpassed its long-term average. The real investment share to value added, which gives a measure of the size of investment in the overall economy, tends to be pro-cyclical over time (see Chart 5). The business investment ratio has also been generally higher in Germany and Spain than in France, as the latter is a more service-intensive economy. The dispersion across the ratios of the largest euro area countries peaked before the crisis but has since fallen back to a lower constant level. From a longer perspective, the euro area ratio and those of other advanced economies trended upwards prior to the crisis for several reasons.[3] A combination of lower cost of finance, increases in replacement investment and technological progress in ICT and the investment goods sector – leading to a fall in the relative price of investment goods – spurred investment in real terms. In some countries, such as Spain, the increase may have also reflected higher expected marginal returns on investment related to a perceived strength in the underlying trend growth rate of the economy. In some countries "over-investment" may have occurred, for instance during the widespread ICT boom in the late 1990s, resulting in "excess capital stock" on the back of unrealistic expectations of firms' marginal returns. During the global financial crisis – and again in the sovereign debt crisis – investment fell much more than value added. In the aftermath of the crisis the ratio started to rise in the euro area, as a normal feature of the cyclical recovery, and has now surpassed its long-term average.[4]

A breakdown of euro area investment by asset classes shows that changes in investment in machinery and equipment contributed mostly to the swings in business investment over the past decade. Machinery and equipment investment arises largely in the corporate sector and is hence a close proxy for business investment. During the recovery since 2013, investment in machinery and equipment (of which transport equipment constitutes about one-quarter) made up most of the total increase in investment, while intellectual property products contributed to the remaining share (see Chart 6). Investment in equipment is gradually recovering and

---

[3] See also Rodriguez Palenzuela, D. and Dees, S., "Savings and investment behaviour in the euro area", *Occasional Paper Series*, No 167, ECB, Frankfurt am Main, January 2016.
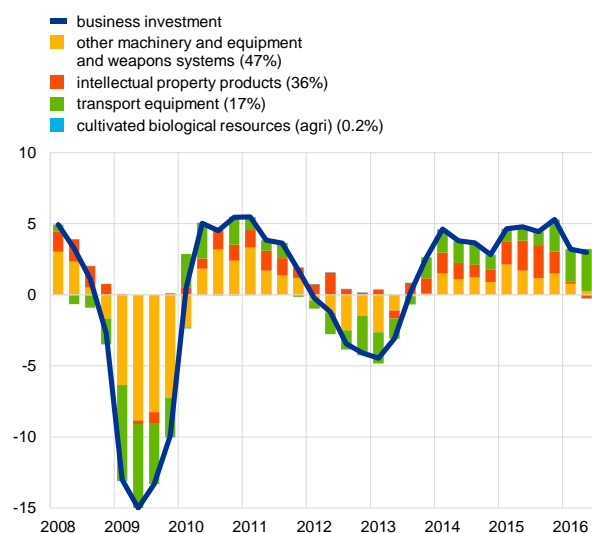
[4] Long-term averages are not to be confused with "optimal" investment levels, and comparisons between countries and across time warrant caution. Countries have different equilibrium ratios of investment to value added, reflecting diverse levels of economic development and different economic structures. Economies are also subject to structural changes over time. For instance, there may be a structural compositional change of value added by which the share of labour income increases as the economies become more service-intensive and less capital-intensive (see OECD Economic Outlook, Vol. 2015/01).

is expected to return to its pre-crisis level, while investment in intellectual property products[5] has proved relatively resilient throughout the past decade.

Chart 6

Breakdown of euro area real business investment by asset classes

(annual percentage changes; percentage points)

- business investment
- other machinery and equipment and weapons systems (47%)
- intellectual property products (36%)
- transport equipment (17%)
- cultivated biological resources (agri) (0.2%)

Sources: Eurostat and ECB calculations.
Notes: The latest observation is for the second quarter of 2016. The relative shares in business investment for 2015 are given in brackets.

The decline in the growth rate of fixed capital formation has led to a deceleration in the growth of euro area capital stock since 2008, which is unprecedented in a historical perspective (see Chart 7). The capital stock, measuring the value of all fixed assets in use, can be derived from cumulated investment adjusted for the technological content of capital goods, relative price trends of capital goods and the depreciation rate. The growth rate of the total economy capital stock for Italy and Spain slowed significantly after the crisis, particularly in Italy, where the capital stock has declined since 2013. Diminishing contributions from the capital stock have weighed on potential output growth in these countries over recent years. The slowdown in capital stock growth has been less pronounced in France and hardly visible in Germany.

Meanwhile, the capital stock depreciation rate has flattened somewhat since the crisis, suggesting a slowdown in the consumption of fixed capital (see Chart 8). Depreciation rates are generally higher for ICT goods than for machinery and equipment (which in turn are higher than for dwellings). Regarding their dynamics, the depreciation rates for the whole economy have levelled out since 2008 in France and Italy, and also in the euro area, albeit in a less pronounced manner. In Germany the flattening took place somewhat later – around 2012. Only in Spain does the depreciation rate seem to have risen since 2008, which may be related to compositional changes in the capital stock, associated with the shrinking construction sector. The change in the euro area depreciation rate with respect to its pre-crisis dynamics may be related to the decline in the capacity utilisation rate and the decreased "wear and tear" of assets. Lower or slower-growing depreciation rates, ceteris paribus, would suggest less need for replacement investment to maintain the level of the capital stock.

---

[5] Shares of intellectual property products to value added have constantly increased in the euro area countries over recent decades and currently range from above 5% of value added in France to about 3% in Italy. According to ESA 2010, investment in intellectual property products mainly comprise research and development expenditure, as well as computer software, databases, literary or artistic originals and mineral exploration.

Chart 7

Total net capital stock growth in the euro area and the largest euro area countries

(annual percentage changes)

- euro area
- Germany
- France
- Italy
- Spain
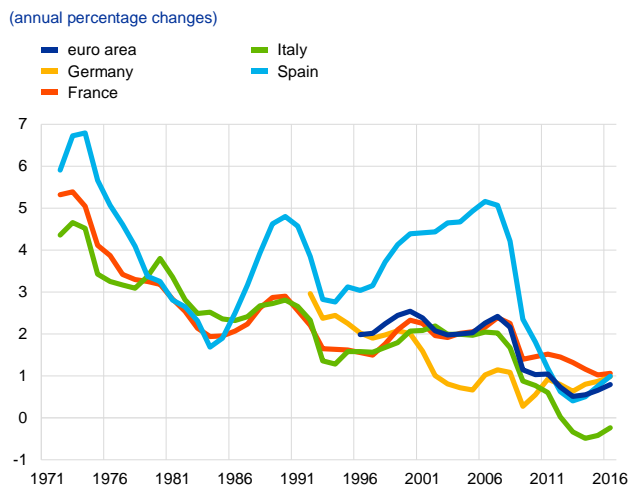
Source: European Commission (AMECO).
Notes: The latest observation is for 2016 (partial projection) for European Commission data. The total net capital stock at constant prices is derived from the previous year's capital stock adjusted for real consumption of capital.

Chart 8

Derived depreciation rates for total economy for the euro area and the largest euro area countries

(percentages)

- euro area
- Germany
- France
- Italy
- Spain
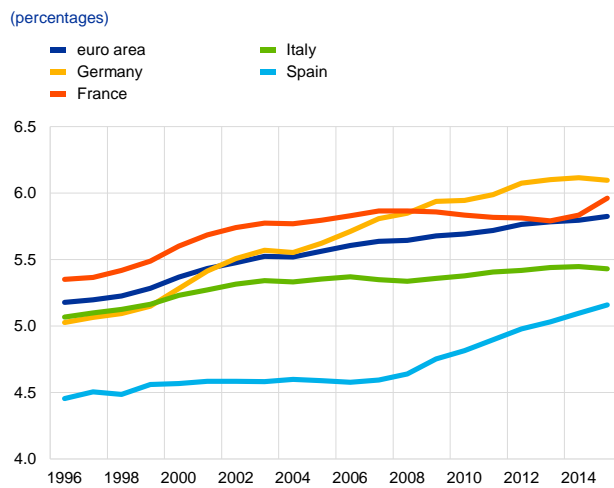
Sources: European Commission (AMECO) and ECB calculations.
Notes: Derived from the net capital stock equation in which the capital stock at (t) equals capital stock (t-1)*(1-delta (t)) + investment (t), where delta is a proxy of the depreciation rate, although also covering the retirement rate.

Fixed capital formation also increases the productive capacity of the economy by boosting labour productivity. During the crisis, productivity growth in the euro area was dampened by the weak contribution of investment to capital deepening (see Box 2).

Box 2

Investment and productivity – a comparison of the euro area and the United States

In the aftermath of the crisis, the slow rebound in euro area investment may further constrain the euro area's ability to boost its long-term lacklustre productivity growth, as investment is a major driver of capital deepening and thus, in turn, an important driver of labour productivity growth. Capital deepening refers to the process of increasing the capital-labour ratio by giving labour more capital to work with. However, capital deepening may also occur with little net investment in times when strong labour shedding mechanically increases the ratio of the capital stock to a depleted workforce. Charts A and B show that, in advance of the crisis, US capital deepening had been increasing at roughly twice the pace of that of the euro area owing, in part, to a markedly higher rate of investment in the United States over the pre-crisis years. With the onset of the crisis, strong labour shedding in both economies helped to mitigate the impact of the notable slowdown in the rate of investment on capital deepening on both sides of the Atlantic. Indeed, for the euro area, the marked reversal in the earlier robust rate of employment growth led to an *increase* in the rate of capital deepening over the course of the main crisis years, despite the strong decline in the rate of investment.
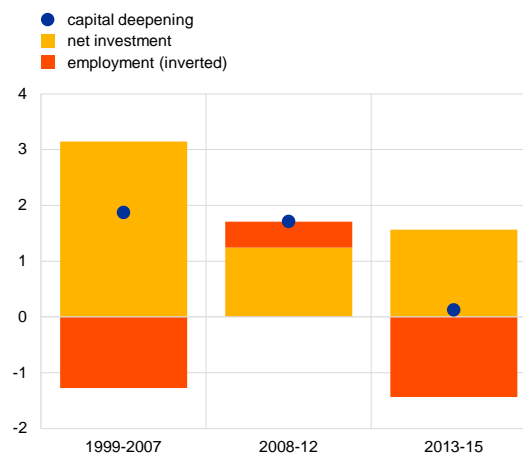
Chart A

Capital deepening in the euro area

(annual percentage changes)

- ● capital deepening
- ■ net investment
- ■ employment (inverted)
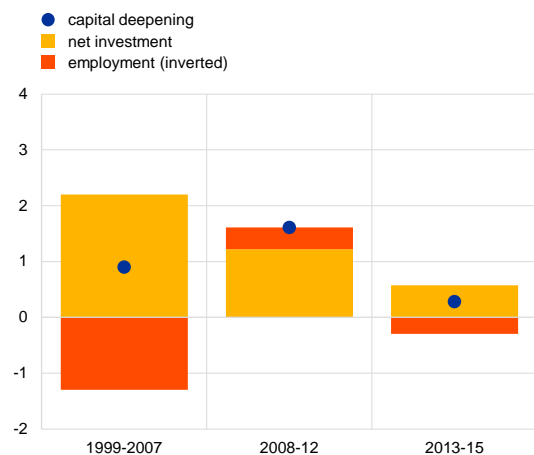
Sources: European Commission (AMECO) and ECB calculations.

Chart B

Capital deepening in the United States

(annual percentage changes)

- ● capital deepening
- ■ net investment
- ■ employment (inverted)

Sources: European Commission (AMECO) and ECB calculations.

Despite the rebound in euro area activity since the first quarter of 2013, euro area capital deepening has barely increased during the economic recovery. A similar stagnation has also occurred in the United States. As the charts show, US investment rebounded more strongly towards pre-crisis rates of increase, while euro area investment remains markedly subdued. In part, this reflects the longer, and stronger, recovery in broader activity in the United States, following the deep but short-lived contraction experienced during the Great Recession of 2008-09. Despite this difference, however, the rate of capital deepening in both economies has been limited, since 2013, by proportionally similar offsetting effects from robust employment growth.[6]

Labour productivity growth in the euro area has been weak due to both capital deepening and growth in total factor productivity. Overall, it is the combined effects of capital deepening and wider "intangible" technological and organisational progress, known as total factor productivity, which determine the pace of an economy's labour productivity growth. The euro area's lacklustre productivity performance in comparison with that of the United States has been a matter of concern to policymakers for the best part of two decades.[7] Charts C and D use a standard growth accounting framework to decompose euro area and US labour productivity growth over the course of Economic and Monetary Union (EMU) into the respective contributions stemming from capital deepening and total factor productivity. These show that, in the post-crisis period, a marked decline in capital deepening has contributed significantly to the slowing in productivity growth in both economies compared with pre-crisis rates.

---

[6] See the article entitled "The employment-GDP relationship since the crisis", *Economic Bulletin*, Issue 6, ECB, 2016. In the United States, the contribution to labour productivity growth from capital deepening – when measured in five-year rolling averages – was negative in 2014 and 2015.

[7] Taking a longer-term perspective, the picture looks bleaker still, as productivity growth – measured as a five-year rolling average – has been slowing in both economies since the early 2000s. In the United States, the last five years represent the period with the lowest rate of productivity growth since the 1950s.

Chart C

Labour productivity growth decomposition for the euro area

(percentage changes; contributions in percentage points)

- labour productivity growth per person employed
- capital deepening contribution
- total factor productivity contribution
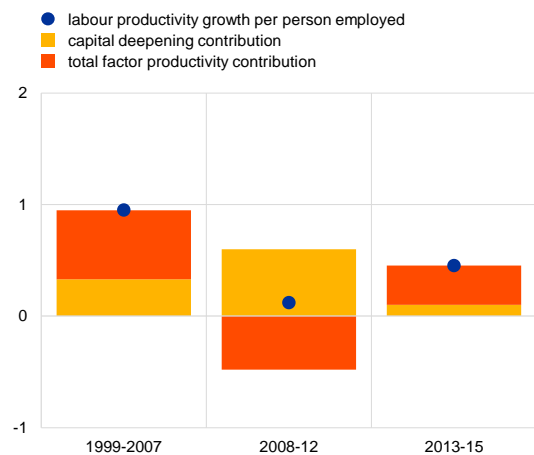
Chart D

Labour productivity growth decomposition for the United States

(percentage changes; contributions in percentage points)

- labour productivity growth per person employed
- capital deepening contribution
- total factor productivity contribution

Sources: European Commission (AMECO) and ECB calculations.
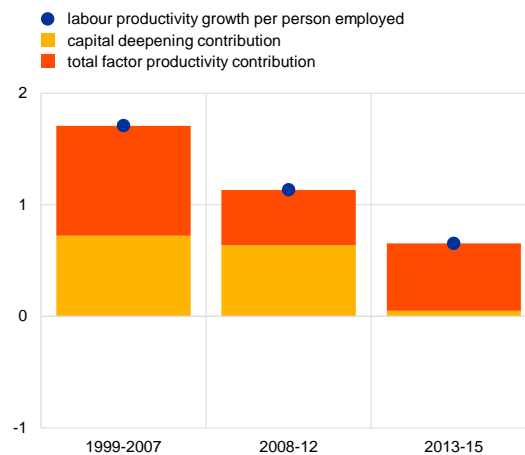
Sources: European Commission (AMECO) and ECB calculations.

Drivers of investment

In the most common economic theories[8], the level of firms' desired capital stock is determined by expectations of returns or planned production levels, the cost of financing and the availability of funding, but also industrial structure and business friendliness. In reality, business investment is determined by a range of factors with complex and multiple interactions, which are not easy to disentangle. In this section we will review some of these factors, notably growth expectations, capacity utilisation, profits, uncertainty, financing conditions and institutional and regulatory variables, and the extent to which they have contributed to the recovery in business investment.

The cyclical upturn in demand, shrinking spare capacity and improving corporate profits are supporting business investment. The decline in expected long-term GDP growth in the euro area – which accelerated during the crisis and is likely to have contributed to the decline in investment – seems to have come to a halt in recent years (see Chart 9). Demand conditions, as reflected in overall activity and capacity utilisation, also matter significantly for investment decisions throughout the business cycle. The perceived large spare capacity during the crisis has gradually shrunk, particularly in the manufacturing industry (see Chart 10). In addition,

---

[8]   For instance, according to Keynes, investment decisions are driven by firms' expectations of the profitability of investment. The accelerator model predicts that investment is proportional to the increase in output in the coming period. The financial accelerator model features capital markets operating under imperfect information, resulting in firms' preferring to retain funds to finance investment projects. Tobin argued that firms' investment levels should depend on the ratio of the present value of installed capital to the replacement cost of capital, a ratio called Tobin's q.

corporate profits have grown over recent years, pointing to firms' increased capacity to finance investment with internal means (see Chart 11). Such increases are widespread across the largest euro area countries and suggest readily available cash when investment opportunities occur.[9] Higher retained earnings have been enabled by lower net interest payments, wage moderation and conservative dividend payments.[10] Moreover, the high financial uncertainty[11] that could also lead firms to postpone investment decisions[12] and that prevailed during the recent crisis has now significantly diminished (see Chart 12).

Chart 9

Expected real GDP growth in six to ten years in the euro area and the largest euro area countries

(annual percentage changes)

- euro area
- Germany
- France
- Italy
- Spain
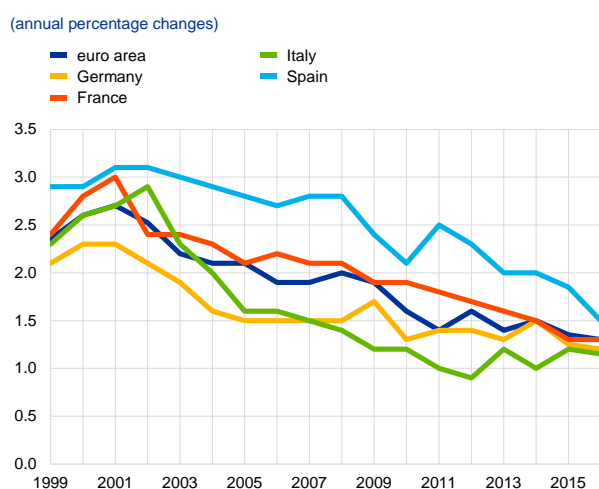
Source: Consensus Economics.
Note: The latest observation is for October 2016.

Chart 10

Surveys on capacity utilisation and the demand situation in the euro area capital goods sector

(deviations from long-term averages)

- current level of capacity utilisation
- demand situation
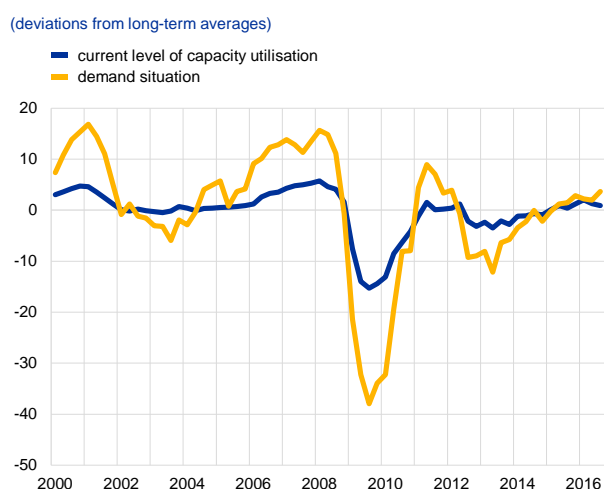
Sources: European Commission and ECB calculations.
Notes: The series on the demand situation is derived as the inverse of the European Commission's series on demand as a constraining factor for production in the capital goods sector. The latest observation is for the third quarter of 2016.

---

[9] NFCs have continued to increase their cash holdings in recent quarters to a new record high (see Chart 19). See also the box entitled "Trends in the external financing structure of euro area non-financial corporations", *Economic Bulletin*, Issue 5, ECB, 2016.

[10] See European Commission, *Quarterly report on the euro area*, Volume 13, Issue 1, April 2014.

[11] See Bloom, N. et al., "Uncertainty and Investment Dynamics", 2007.

[12] See, for instance, Bonciani, D. and van Roye, B., "Uncertainty shocks, banking frictions and economic activity", *Working Paper Series,* No 1825, ECB, Frankfurt am Main, July 2015.

Chart 11

Total economy gross operating surplus in the euro area and the largest euro area countries

(annual percentage changes)

- euro area
- Germany
- France
- Italy
- Spain
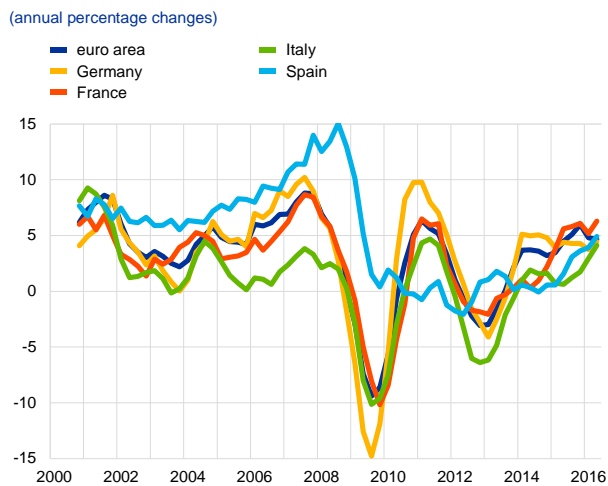
Sources: Eurostat and ECB calculations.
Note: The latest observation is for the second quarter of 2016.
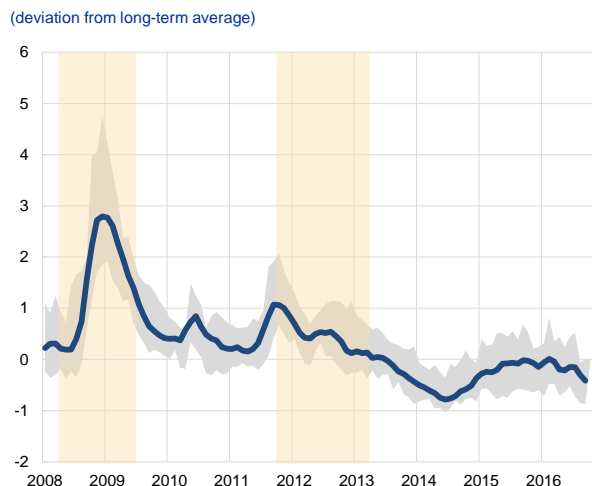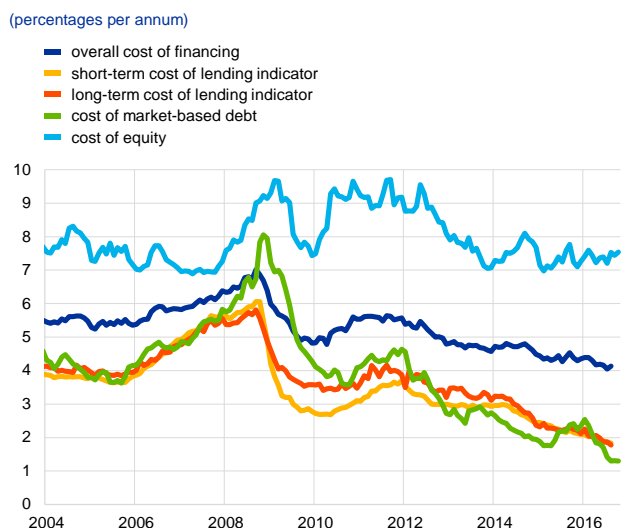
Chart 12

Euro area uncertainty

(deviation from long-term average)

Source: ECB.
Notes: The light-orange shaded areas represent periods of recession according to the CEPR classifications. The solid blue line represents the median of the measures and the grey area represents the range of macroeconomic uncertainty indices. The latest observation is for September 2016.

Chart 13

Nominal cost of external financing for euro area NFCs

(percentages per annum)

- overall cost of financing
- short-term cost of lending indicator
- long-term cost of lending indicator
- cost of market-based debt
- cost of equity

Sources: Thomson Reuters Datastream, Merrill Lynch, ECB and ECB calculations.
Notes: The overall cost of financing for NFCs is calculated as a weighted average of the cost of bank lending, the cost of market-based debt and the cost of equity, based on the respective amounts outstanding derived from the euro area accounts. The cost of equity estimates are based on a three-stage dividend discount model. The latest observation for the overall cost and lending rates is for August 2016, whereas the latest observation for the cost of market-based debt and quoted equity is for 14 October 2016.

Financing costs for euro area non-financial corporations (NFCs) have become increasingly supportive of business investment since the crisis, largely as a result of expansionary monetary policy measures. The overall nominal cost of external financing for euro area NFCs has trended downwards since 2012 and is currently standing at a historically low level (see Chart 13). Initially, the fall was mostly driven by a decline in the cost of equity financing, mirroring lower risk premia and the recovery in equity prices, but costs of equity have become more volatile since 2015. In addition, supported by the ECB's monetary policy, the cost of bank lending and market-based debt financing has continued to decline until very recently. The fall in the cost of debt financing has been broad-based across euro area countries (see Chart 14). However, despite very low interest rates, the monetary transmission channel has been impeded during the crisis period, as firms have not been able to take full advantage of low interest rates to invest more. Indeed, banks tightened credit standards markedly between mid-2007 and early 2009, and again between mid-2011 and early 2012 (see Chart 15). The results from Bayesian VAR models and a time-varying VAR model also suggest that restrictions in bank loan supply were responsible for reducing NFC credit growth significantly in 2009 and 2010, as well as

between 2012 and 2014.[13] However, financial fragmentation has receded and banks' balance sheets have strengthened significantly over the last couple of years. As a result, bank lending conditions have improved markedly and credit supply-driven shocks are now estimated to contribute positively to loan growth. See Box 3 on the survey evidence regarding the impact of financial constraints on the investment behaviour of euro area NFCs.

Chart 14

Nominal cost of debt financing for NFCs in selected euro area countries

(percentages per annum)

- euro area
- Germany
- France
- Italy
- Spain
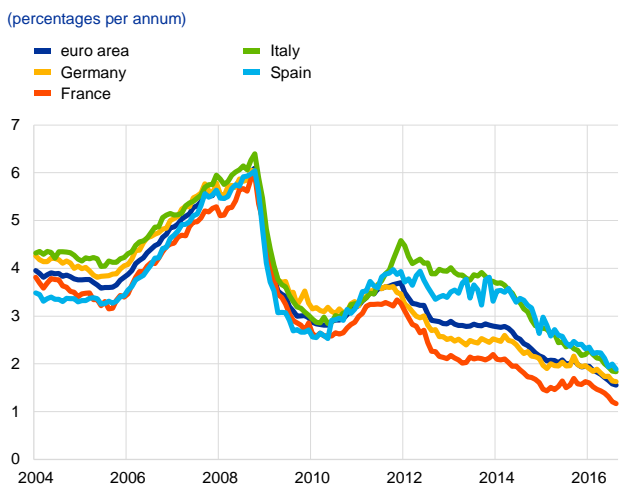
Sources: Markit iBoxx, ECB and ECB calculations.
Notes: The nominal cost of debt financing for NFCs is calculated as a weighted average of the cost of bank lending and the cost of market-based debt, based on their respective amounts outstanding derived from the ECB monetary financial institutions' balance sheet items statistics and the ECB securities issue statistics. The latest observation is for August 2016.

Chart 15

Changes in credit standards applied to the approval of loans or credit lines to NFCs in selected euro area countries

(net percentages)

- euro area
- Germany
- France
- Italy
- Spain
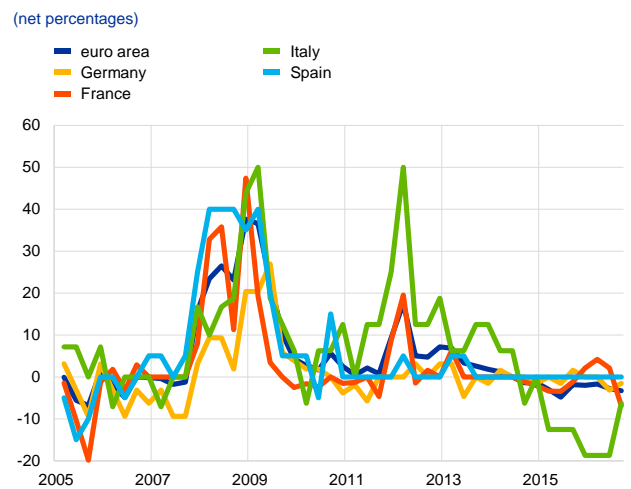
Source: ECB.
Notes: Tightening of credit standards (+) / easing of credit standards (-). The latest observation refers to the July 2016 euro area bank lending survey.

Box 3

Recent business investment developments from the perspective of firm-level survey data

An indicator of credit constraints constructed from firm-specific survey replies suggests that credit constraints are declining. The ECB and European Commission Survey on the access to finance of enterprises[14] can help to explain the recent dynamics of business investment in the euro area by linking the investment decisions of firms to their perceptions regarding the business environment and to their financial situation. A firm is considered "credit constrained" whenever (i) it applied for a bank loan or credit line and its application was (either wholly or partly) denied, (ii) it

---

13   See Altavilla, C., Giannone, D. and Lenza, M., "The financial and macroeconomic effects of OMT announcements", *Working Paper Series*, No 1707, ECB, Frankfurt am Main, August 2014; Altavilla, C., Darracq Paries, M. and Nicoletti, G., "Loan supply, credit markets and the euro area financial crisis", *Working Paper Series*, No 1861, ECB, Frankfurt am Main, October 2015; and Gambetti, L. and Musso, A., "Loan Supply Shocks and the Business Cycle", *Journal of Applied Econometrics*, 2016, forthcoming.

14   The Survey on the access to finance of enterprises provides evidence on changes in the financial situation, financing needs and access to external financing of small and medium-sized enterprises (SMEs) in the euro area, and compares it with that of large enterprises. The survey started in 2009 but this box covers the period from April 2014 (survey round 11) to March 2016 (survey round 14), when a specific question on investments in property, plant or equipment was included.

refused the loan because the associated costs were too high, or (iii) it was discouraged from applying for a bank loan although it needed it. The indicator fell to 11% of SMEs and 6% of large firms in March 2016, from 16% and 8%, respectively, two years before.

Survey evidence suggests that a lack of financing may still act as a drag on investment. Among firms that have increased investment during the preceding six months, financially unconstrained non-financial corporations (NFCs) report increasing investments almost twice as often as enterprises facing constrained access to credit (see Chart A).

Chart A

Increase in investment of euro area NFCs by firm size and by the credit constraints index

(weighted percentages of respondents)

- micro-small firms
- medium-large firms
- all firms
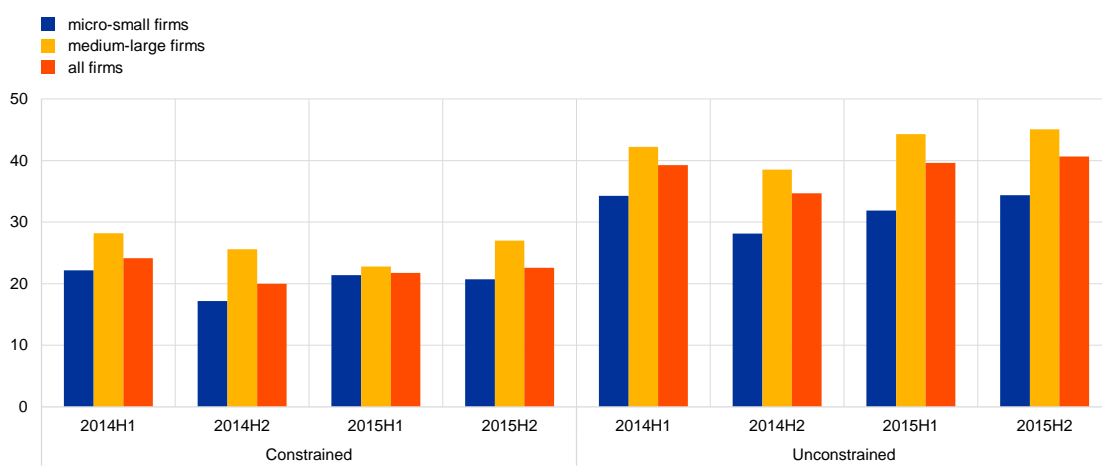
Sources: ECB and European Commission Survey on the access to finance of enterprises.
Notes: Firm size is defined in terms of employees. "Micro-small firms" refers to those firms having from 1 to 49 employees, while "medium-large firms" are those which have 50 or more employees. The credit constraints index is calculated as the sum of the percentages of firms that (i) applied for a bank loan or credit line and their application was (either wholly or partly) denied, (ii) refused the loan because the associated costs were too high or (iii) were discouraged from applying for a bank loan although they needed it.

Econometric analysis provides further insights on the determinants of investment. To analyse the determinants of investment, a dummy variable, which takes the value 1 if the firm has reported increases in investment in the preceding six months or 0 if not, is regressed on a set of factors. These are firm-specific factors related to the company's financial situation, capital structure and demographics, as well as factors related to its business environment[15]. Furthermore, the credit constraints indicator is added as an explanatory variable, while a set of other variables control for the intensity of problems encountered by firms in their daily business activity, for instance finding customers, competition or regulation[16]. The analysis only considers firms that either applied for a bank loan or were discouraged from applying.

---

[15] A first set of variables controls for size, age, turnover classes and whether firms are independent or family-owned. A second one controls for the financial situation of firms in terms of sales, profitability and own capital, as well as for firms' perceptions related to the general economic outlook and credit availability. All these variables are binary and set equal to 1 if there is an improvement in the factor. In addition, a third set of variables takes into consideration various sources of finance – either internal or external, such as retained earnings, grants, bank products, trade credit and market-based instruments – used by firms to run their business.

[16] Firms are asked to rate factors that they see causing concerns for their businesses on a scale from 1 (not at all important) to 10 (extremely important). Such factors include "Finding customers", "Competition", "Access to finance", "Cost of production", "Availability of skilled labour" and "Regulation".

Chart B

Factors affecting the likelihood of euro area NFCs increasing investment

(marginal effects based on probit regressions)
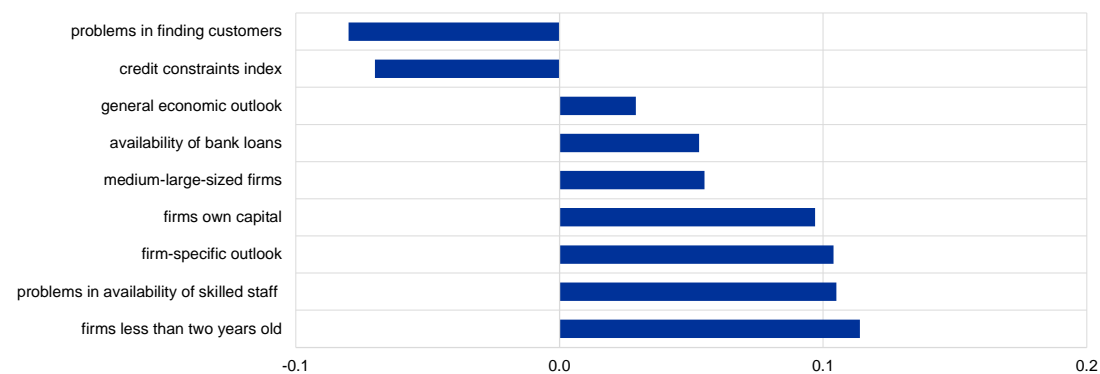
Sources: ECB and European Commission Survey on the access to finance of enterprises and ECB calculations.
Notes: The dependent variable is a binary one that takes the value 1 if the firm has reported increases in investment in the preceding six months or 0 if not. Only statistically significant coefficients are reported, with the exception of the various sources of finance, which are not reported in the chart. Estimates are based on weighted probit regressions (see the Survey on the access to finance of enterprises for an explanation of the weights used). The regressions include country/industry fixed effects and time fixed effects, and errors are clustered at the regional level. The estimation period is from April 2014 to March 2016 for 12 euro area countries.

Generally, very young firms, as well as firms with better growth perspectives and more own capital, are more likely to report increased investment. This follows from Chart B, where the bars indicate the marginal increase in the predicted probability of a representative firm increasing investment due to a given factor. For example, the chart shows that young firms (less than two years old) signal increases in investment with an 11% higher probability. This probability of increased investment is 10% higher for firms with a better economic outlook. Moreover, the availability of bank loans raises the probability of increasing investment by 5%, while the impact of improvements in the general economic environment is somewhat smaller (3%). By contrast, being credit constrained has a large negative impact on investment, reducing the probability of increases in investment by 7%. There is also evidence that firms signal increases in investment with a 11% higher probability when they report problems in the availability of skilled labour forces, while for firms facing problems in finding customers this probability is reduced by 8%.

Overall, survey evidence suggests that financial constraints have a negative impact on the investment behaviour of euro area NFCs. At the same time, the credit constraints indicator, and therefore also the negative impact on investment, has declined somewhat over recent years. Consistently, other data in the Survey on the access to finance of enterprises (see Chart C) show that restrictions in bank loan supply have gradually receded and have led to improvements in the availability of bank financing (loans and bank overdrafts).

Chart C

Credit constraints index and availability of bank loans and bank overdrafts

(preceding six-month period; percentage of respondents, left-hand scale; net percentage of respondents, right-hand scale)

- credit constraints index (left-hand scale)
- bank loans availability (right-hand scale)
- bank overdraft availability (right-hand scale)
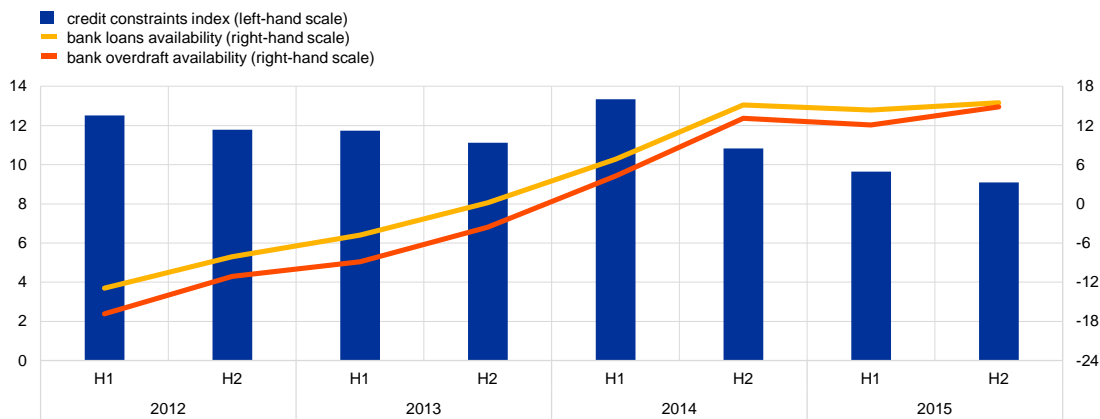
Sources: ECB and European Commission Survey on the access to finance of enterprises.
Note: base: left-hand scale, all enterprises; right-hand scale, enterprises for which the respective instrument (bank loan or bank overdraft) is relevant.

Business investment should also be supported by firms' increasing recourse to external sources of financing as a result of lower costs and fewer credit supply restraints. The annual flow of bank and market-based financing to euro area NFCs has continued to increase in recent quarters and has reached levels similar to those seen in autumn 2011 (see Chart 16). Overall, the recovery in external financing has been supported by the strengthening of economic activity, further declines in the cost of bank lending and market-based debt, the easing of bank lending conditions, as well as a larger number of mergers and acquisitions. At the same time, NFCs' record high liquid asset holdings (which include cash and deposits) have reduced the need for external financing.

Chart 16

Bank loans, debt securities and quoted share issuance of NFCs in selected euro area countries
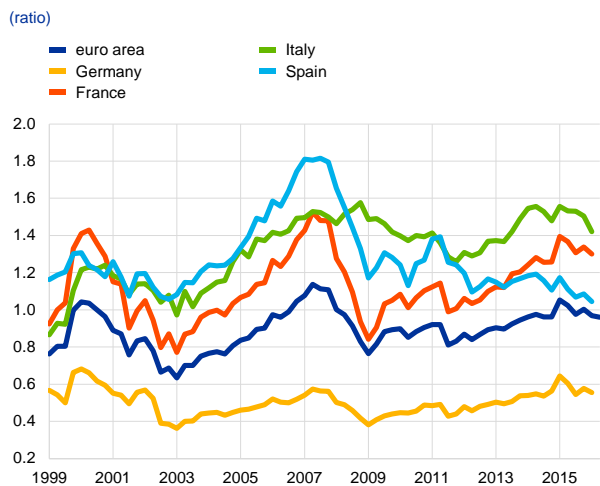
(EUR billions; 12-month flows)

- bank loans
- debt securities
- quoted shares
- total
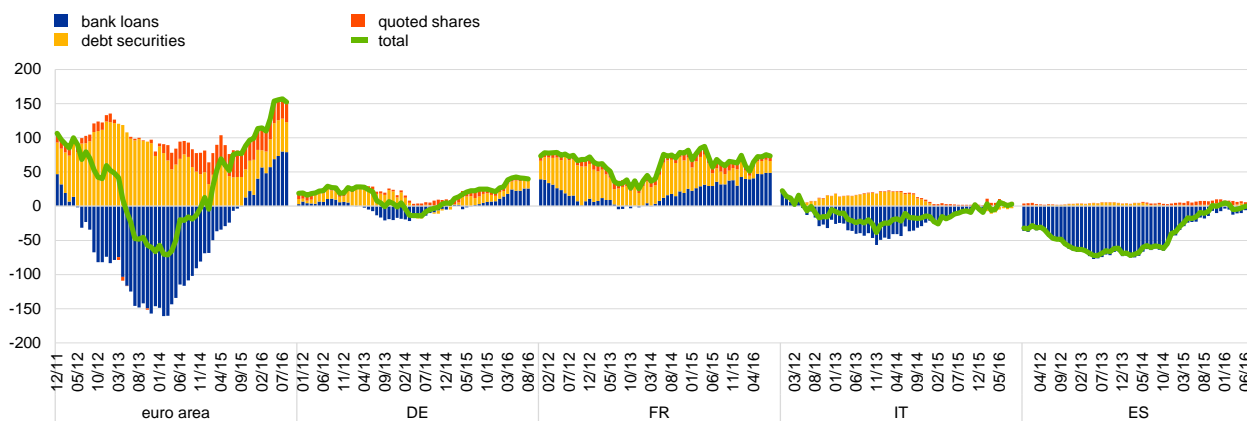
Source: ECB.
Note: The latest observation is for August 2016.

Chart 17

Equity-to-net worth of NFCs in selected euro area countries

(ratio)

- euro area
- Germany
- France
- Italy
- Spain

Sources: Eurostat, ECB and ECB calculations.
Notes: Net worth is at book value and calculated as total assets (sum of financial and non-financial assets) held minus the outstanding amounts of debt liabilities (total liabilities net of shares and other equity issued). Data on non-financial assets for Spain are based on ECB staff estimates. The latest observation is for the second quarter of 2016 for the euro area and for the first quarter of 2016 for the countries.

The measures of the marginal value of capital (Tobin's q) have increased significantly from their post-Lehman and mid-2012 levels (see Chart 17).[17] This signals increased incentives for capital investment. The Tobin's q measures have moderated somewhat since early 2015, but remain significantly above their post-Lehman and mid-2012 levels and should still be supportive of business investment. This is confirmed by the results from a VAR model that includes, as variables, real business investment, real gross operating surplus of NFCs, corporate bond spreads and Tobin's q. The results show that, since early 2014, Tobin's q-driven shocks have increasingly supported business investment growth.[18] This reflects the positive impact of monetary policy, which has reduced macro risk, and thus also corporate default risk in an uncertain environment, and has translated into higher corporate stock prices and improvements in the Tobin's q measures. The fall in the macro and corporate default risk is visible in the observed declines in the expected default frequencies of euro area listed firms and in corporate bond spreads after early 2009 and again after mid-2012. In recent quarters, the positive contribution from the Tobin's q-driven shocks has declined, following the observed decline in stock prices in the first half of 2016 and the gradual strengthening of debt financing growth.

The average euro area corporate gross debt ratio remains historically high, which may weigh on investment decisions (see Chart 18). From a medium-term perspective, high gross debt levels in a number of countries, in combination with possibly higher interest rates, may warrant further deleveraging since a large share of corporate debt is at variable rates. Meanwhile, among the largest euro area countries, the gross debt ratio of NFCs in Spain has fallen considerably since mid-2012 and has reached the average euro area level, benefiting from significant debt write-offs and net redemptions in bank loans. Under severe financial distress conditions – high gross debt levels combined with high perceived default probabilities – NFCs tend to reduce their investment spending significantly. However, firms' record high liquid asset holdings and historically low debt servicing costs should mitigate the possible negative impacts of high debt levels on the economy in the current climate (see Chart 19).

---

[17]   Tobin's q is defined as the equity-to-net-worth ratio, with equity being calculated at market value and net worth at book value.

[18]   See Philippon, T., "The Bond Market's q", *The Quarterly Journal of Economics*, Oxford University Press, Vol. 124(3), 2009, pp. 1011-1056, for an assessment of the impact of the b-measure of Tobin's q, instead of the equity-to-net-worth ratio, on business investment growth in the United States in a similar kind of framework.

Chart 18

Consolidated gross debt of NFCs in selected euro area countries

(as a percentage of nominal GDP)

- euro area
- Germany
- France
- Italy
- Spain
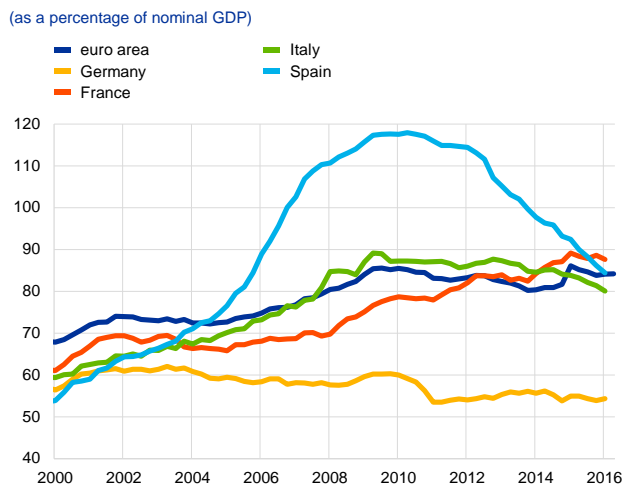
Sources: Eurostat, ECB and ECB calculations.
Notes: Debt is total loans net of inter-company loans, debt securities issued and pension liabilities. The latest observation is for the second quarter of 2016 for the euro area and for the first quarter of 2016 for the countries.

Chart 19

Cash holdings of NFCs in selected euro area countries

(as a percentage of nominal GDP)

- euro area
- Germany
- France
- Italy
- Spain
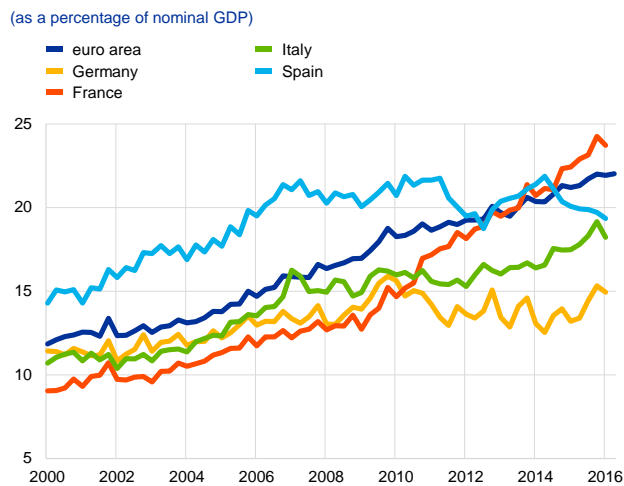
Sources: Eurostat, ECB and ECB calculations.
Notes: Cash includes currency and deposits. The latest observation is for the second quarter of 2016 for the euro area and for the first quarter of 2016 for the countries.

Box 4 sets out to bring together the drivers of investment dynamics in a modelling framework.

Box 4

Drivers of business investment through the lens of a VAR model

Additional insights on the impact of various factors on investment may be gained with the help of a model bringing the main factors together. This box presents evidence from a VAR model on drivers of business investment, such as real factors and uncertainty.[19] While real factors are found to have supported the recent investment recovery, uncertainty is still weighing on investment growth. For the purposes of the model, "business investment" refers to year-on-year growth in total investment net of housing investment and net of interpolated annual government investment, the latter taken from the AMECO database. "Demand" is GDP adjusted for business investment, "profits" refers to year-on-year growth in total economy gross operating surplus and "investment" represents investment-specific shocks. "Interest rate" refers to NFCs' lending rates and the "uncertainty" measure is the financial volatility index VIX. Shocks are orthogonal and the identification uses Choleski decomposition, where uncertainty is ordered first.

---

[19] The impulse responses of investment to the variables used in the VAR model show that the variables all have the expected sign and are significant for several periods following the shock.

Chart A

Breakdown of euro area business investment growth

(annual percentage change; percentage points)
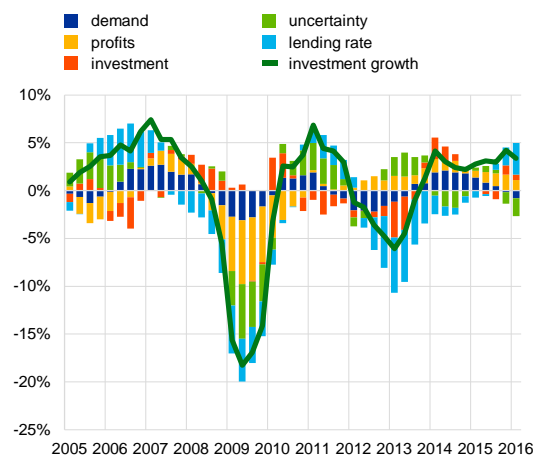
Sources: Eurostat, European Commission and Thomson Reuters Datastream.
Note: The latest observation is for the first quarter of 2016.

According to the model, the current business investment recovery in the euro area is being driven by profit growth and improving demand. The results suggest that the investment recovery has been driven by a number of factors that have positively influenced investment at different stages, while some factors have continued to exert a drag. Profit growth seems to be the main driver (see Chart A). A declining negative impact in 2013, followed by an increasingly important positive contribution from improving demand, also supported business investment during the recovery. Reduced uncertainty and falling interest rates, together with the impact of the investment-specific shock, have also periodically been factors supporting the recovery, although uncertainty in this specification has weighed on investment more recently. Some caveats are attached to this type of estimate, as it is dependent on the choice of data and combination of variables. Still, it is a useful way to describe the time-varying impact of various factors and their relative importance during the investment recovery.

Long-term business investment decisions are affected by several institutional and regulatory factors. Regulatory and institutional factors describe the overall country-specific attractiveness of doing business and cover labour market institutions, product market regulations, tax systems, debt restructuring mechanisms and contract enforcement frameworks, as well as the overall quality of the public administration and the judicial system.[20] Not only can regulatory burdens and poor institutions affect the actual costs of investment projects, but they can also exacerbate the effects of uncertainty for any given future revenue and spending stream.[21] In particular, the creation of new firms can be affected by barriers to entry, for example owing to cumbersome licencing procedures. Additionally, administrative procedures can substantially affect the timing of the authorisation process and the expected costs of the investment. Moreover, highly rigid labour market institutions, which prevent an optimal allocation of labour, can discourage more innovative and risky investments, increase expected project costs and lower the capacity to reallocate and adjust firms' output. Firms' decisions are also very sensitive to the degree of irreversibility of their capital plans. In this respect, an efficient judicial

[20]   A review of the importance of sound institutions for increasing economic resilience and thus influencing investment decisions can be found in the article entitled "Increasing resilience and long-term growth: the importance of sound institutions and economic structures for euro area countries and EMU", *Economic Bulletin*, Issue 5, ECB, 2016.

[21]   In Bloom et al (2007), factors which increase the irreversibility of capital accumulation tend to make firms more cautious.

system and an effective debt restructuring procedure further increase the resilience of the economy by supporting a business environment in which it is easier to reallocate capital should an investment project become unprofitable.

Chart 20

Institutional features and business investment performance

(x-axis: standardised Index Economic Freedom (2008); y-axis: business investment growth (2008-14))
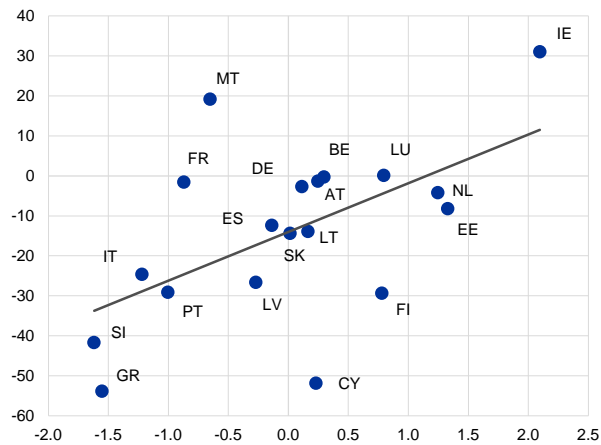
Sources: Heritage Foundation (Index of Economic Freedom) and Eurostat.
Notes: Business investment is defined as private non-residential investment. Higher values for the Index of Economic Freedom signal higher free market conditions.

Despite significant reforms in recent years, several regulatory and institutional factors continue to drag on business investment. Chart 20 shows the relationship between an index that measures the overall capacity of a country to compete in international markets, based on the rule of law, size of government and regulatory efficiency and open market policies (Heritage Foundation's Index of Economic Freedom) in 2008 and the investment performance five years later. The chart shows that there is a clear positive correlation between a more business-friendly environment (higher value in the economic index) and higher business investment growth over five years.

The interaction between regulatory and institutional factors and other drivers analysed above may lead to non-linear effects on business investment (see Box 5). In some euro area countries, an example is the interplay between a high level of indebtedness across firms and inefficient debt restructuring frameworks, which can slow down the deleveraging process and therefore postpone new investment projects.

Box 5

Investment growth and structural reforms

This box looks at the link between country-specific structural characteristics and business investment performance. Informed by the firm-based evidence reported in Box 3, the exercise described in this box aims to test, at the macro level, the relevance of structural variables for investment decisions. Based on the data available for ten euro area countries, a panel data model is estimated for the period 2002-14, which links business investment growth to a set of macro and structural variables.

Table A

Effect from structural reforms

Dependent variable: Real business investment growth	Model (1)	Model (2)
Real GDP growth (t-1)	0.665***	0.621***
	(0.180)	(0.178)
Real long-term rate (t-1)	-0.246	-0.197
	(0.157)	(0.154)
Uncertainty (t-1)	-0.584**	-0.614***
	(0.229)	(0.229)
Credit restrictions (BLS)	-0.027**	-0.026**
	(0.011)	(0.011)
Leverage cycle (t-1)	-0.151***	-0.073
	(0.048)	(0.051)
Doing Business indicator (DBI)	0.316**	0.158
	(0.151)	(0.157)
DBI * leverage cycle (t-1)		-0.354***
		(0.132)
Constant	1.115**	1.125**
	-0.443	-0.435
Observations	490	490
R-squared	0.25	0.26

Sources: ECB, Eurostat and World Bank.
Notes: Robust standard errors in parentheses; significance levels: *** for p-value < 0.01, ** for p-value < 0.05 and * for p-value < 0.1. Real long-term rate refers to real rate of over one year. Uncertainty is defined as the square root of mean squared daily equity returns of the national stock market index. The leverage cycle is based on an HP filter.

Regulatory and institutional indicators are found to be significant in explaining business investment growth. Table A shows the results of the estimated empirical panel model, where real business investment growth is the dependent variable and real GDP growth, the real long-term lending rate, a measure of uncertainty based on stock market volatility, an indicator of credit supply restrictions based on the euro area bank lending survey, the cyclical component of NFCs' debt-to-asset ratio as a measure of excess leverage (leverage cycle) and the World Bank's Doing Business indicator as a variable measuring the business environment are the explanatory variables.[22] Column (1) shows that higher real GDP growth and a more business-friendly environment have a positive effect on business investment growth, while higher uncertainty, tighter credit supply conditions and excess leverage tend to depress business investment growth.[23]

Model estimates suggest that the interaction between structural and certain cyclical factors may exacerbate business investment dynamics in crisis times. This effect is captured 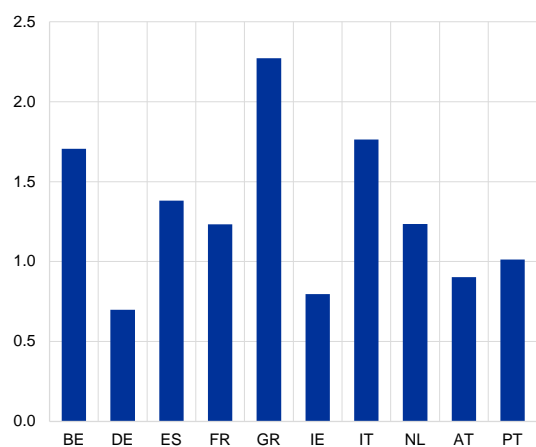by including an interaction term between excess leverage and the business environment indicator (see Table A, column (2)). The additional interaction term is significant and suggests that the interplay between countries with overly indebted firms and a weaker business environment would negatively affect business investment growth.

---

[22] Estimation results and economic implications are robust to the choice of other structural indicators such as the Heritage Foundation's Index of Economic Freedom, the OECD's Employment Protection index and the World Bank's Insolvency Framework index. All variables but the structural indicators and the bank lending survey indicator are lagged.

[23] The lending rate is significant in a panel regression without uncertainty. After introducing uncertainty, the lending rate loses significance in our estimation sample.

Chart A
Effect from structural factors

Achieving a more business-friendly environment can significantly boost business investment growth. Based on the empirical model, it is possible to simulate the effect of countries aiming to improve their relative ranking in the World Bank's Doing Business indicator vis-à-vis the best three OECD performers. Chart A shows that such a reform effort would lead, on average, to an increase in business investment growth of approximately 1 percentage point per year, with the highest gains achieved in the countries that are furthest away from best OECD practices. While these results are in line with existing empirical evidence showing the importance of the quality of institutions to capital accumulation, productivity and growth (Alesina et al., 2005),[24] they should be interpreted with caution, given the partial equilibrium nature of the exercise, the relatively limited time span used, the proxies used for measuring uncertainty (which only rely on stock market volatility) and the leverage cycle, which is based on an HP filter.

Structural policies fostering investment

There is a wide range of structural policies that are expected to be investment-enhancing. These policies generally aim to improve the regulatory environment and credit conditions, reducing entry barriers and increasing the overall flexibility of labour and product markets. Investment-enhancing policies are expected to affect investment via many channels: by affecting firms' cost of adjusting capital stock, easing the expansion of productive capacity, altering the rate of return on capital, increasing the availability of credit to the economy, lowering administrative burdens and influencing expectations and confidence and thus reducing uncertainty. Many euro area countries have embarked on a number of investment-enhancing reforms since 2011; however, the pace of implementation has significantly slowed in recent years.[25]

Policies that increase competition, reduce administrative burdens and favour business-friendly regulations provide positive support to investment. In this respect, three classes of policy seem particularly important: (i) reforms that affect market efficiency and improve corporate governance structures, including state-

---

[24] Alesina, A., Ardagna, S., Nicoletti, G. and Schiantarelli, F., "Regulation and Investment", *Journal of the European Economic Association*, 3(4), 2005, pp. 791-825.

[25] On the low degree of implementation of product market reforms, see the box entitled "The 2016 macroeconomic imbalance procedure and the implementation of the 2015 country-specific recommendations", *Economic Bulletin*, Issue 2, ECB, 2016.

owned enterprises, which can alter the provision of goods and services in specific market segments; [26] (ii) reforms of licensing and administrative procedures that may significantly reduce the burdens of establishing a new firm, especially for non-domestic investors; and (iii) reforms that can reduce or eliminate barriers to entry with a focus on the services sector, including professional services and network industries. With the deleveraging process still ongoing across euro area countries, a way forward to generate additional business investment is to implement policies that can back the creation of new firms and new investment projects. This would also contribute to sectoral reallocation from crisis-hit sectors to more productive and innovative industries. These policies are particularly important to foster the Single Market and thus to increase the positive spillovers to investment resulting from more integrated and highly efficient economies. In the above areas, the pace of reform in recent years has remained relatively limited compared with country-specific needs and the overarching objective of enhancing economic integration within the Single Market. The importance of these reforms has also been emphasised in the context of the 2016 country-specific recommendations, where the Commission has significantly increased the number of recommendations addressing the need for policies to support investment through the enhancement of framework conditions. [27]

High efficiency and flexibility in the labour market is also conducive to higher investment growth. [28] A comprehensive approach to labour market reforms should include measures that can support the reallocation of unemployed people away from crisis-hit sectors, limit the negative effects of the depreciation of labour skills and avoid hysteresis effects on long-term unemployment dynamics. Increasing labour market flexibility may also favour more innovative investment projects, as they tend to be riskier and usually require more job reallocation. Significant labour market reforms have recently been implemented across the most vulnerable euro area countries and their effects need to be continuously monitored.

Measures to address the high level of indebtedness and the lack of an efficient debt restructuring framework are particularly important to support investment across some euro area countries. An efficient system to restructure indebted corporates (e.g. by facilitating out-of-court settlements, reducing time for insolvency proceedings and facilitating the repossession of collateral) and to avoid a sudden increase in the level of non-performing loans (NPLs) can positively contribute to the recovery. These policies would reduce the rigidity and complexity of the business environment and support the reallocation of firms towards more innovative and productive sectors. A stronger institutional infrastructure and supportive regulatory policies for the banking sector could provide further incentives for debtors and creditors to engage in debt restructuring. Policies to facilitate the transfer of non-performing assets to new owners would also support the repair of bank balance

---

[26] Corporate governance can shape firms' balance sheet structures and their dependence on external financing sources, as well as their risk appetite. These factors have important implications for the accumulation of fixed assets in NFCs (see, for example, Zingales, L., "Corporate Governance", in Newman, P. (ed.), *The New Palgrave Dictionary of Economics and the Law*, 1998).

[27] See the box entitled "The 2016 country-specific recommendations", *Economic Bulletin*, Issue 5, ECB, 2016.

[28] See the box entitled "What is behind the low investment in the euro area? Responses from a survey of large euro area firms", *Economic Bulletin*, Issue 8, ECB, 2015.

sheets (e.g. by fostering a market for NPL-backed securities). These actions would strengthen the capacity of the banking sector to provide loans to the economy. They would strengthen the balance sheet of banks and at the same time help distressed, but viable, borrowers to start receiving new credit. In recent years, some countries have modernised their legislative frameworks for debt restructuring, but more effort is needed to make the new frameworks more effective and to increase their harmonisation across European countries.

Chart 21

Quality of infrastructure in the euro area, United States and the largest euro area countries

(scale from 1 to 7; higher scores indicate better infrastructure)
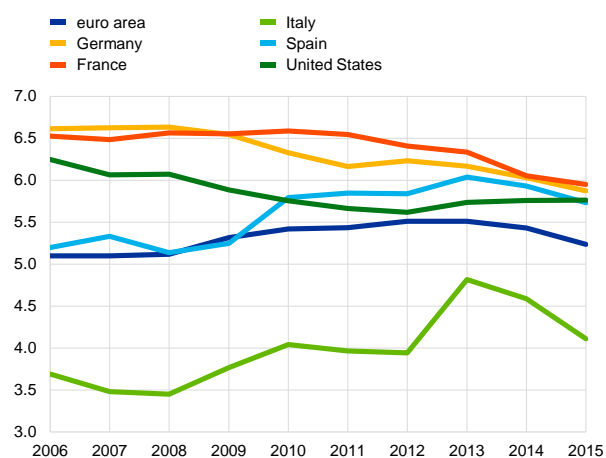
Source: World Economic Forum, Global Competitiveness Report survey.
Note: The latest observation is for 2015.

Finally, targeted and efficient infrastructure investment can support business investment. A considerable volume of empirical literature in the early 1990s has highlighted the importance of physical infrastructure as a determinant of economic growth (e.g. Easterly and Rebelo).[29] Infrastructure investment enhances the productivity of private capital, raising its rate of return and encouraging more investment. The availability of good quality physical infrastructure is also an important consideration for multinational enterprises in their locational choices for foreign direct investment. Infrastructure investment is generally provided by the public sector, public-private partnerships or regulated private entities, in view of the fact that this type of investment tends to have significant up-front costs, while the benefits or returns accrue over very long periods of time. The longevity (and the associated difficulty of ascertaining adequate returns over such a long horizon) can pose a challenge to private financing

and provision. In deciding which infrastructure projects to undertake, governments must carefully weigh broader social returns against funding costs and fiscal consequences. Some euro area countries have witnessed a significant decline in public investment over recent years, while others have continued to see relatively low levels during the past 15 years.[30] At the same time the quality of the existing stock of infrastructure has been declining (see Chart 21). With a view to having a comprehensive strategy to stimulate investment and to create new jobs in Europe, the EU Investment Plan was launched in November 2014,[31] financed by the newly established (June 2015) European Fund for Strategic Investments (EFSI).[32] By August 2016, the EFSI had supported one-third of the total expected funding for investment projects,[33] which targets both small-medium enterprises and larger projects. Over the longer term, the effects of the Plan may be sizeable provided that

---

[29] Easterly W. and Rebelo, S., "Fiscal policy and economic growth: an empirical investigation", *Journal of Monetary Economics,* 32(3), 1993, pp. 417-458.

[30] See the article entitled "Public investment in Europe", *Economic Bulletin*, Issue 2, ECB, 2016.

[31] See the box entitled "The Investment Plan for Europe – "the Juncker plan"" in the article "Public Investment in Europe", *Economic Bulletin*, Issue 2, ECB, 2016.

[32] See the box entitled "Flexibility within the Stability and Growth Pact", *Economic Bulletin*, Issue 1, ECB, 2015.

[33] According to the initial assumptions, the EU investment plan is expected to mobilise about €315 billion in funding for additional investment projects. A subsequent proposal from the European Commission aims to increase the current EFSI funding to €500 billion and extend its activities to 2020.

investment projects are chosen based on their productivity-enhancing impact and that they are implemented efficiently.

Conclusion

Cyclical and structural factors supporting the investment recovery have improved over recent years. The recovery, underway since 2013, has been driven by improving demand and profit conditions and, for some euro area countries, good progress in the deleveraging process and improved financing conditions.

In the years ahead, improving cyclical factors should continue to support business investment, while a slower underlying growth potential and remaining elevated debt may hold back investment decisions. Looking forward, business investment is expected to continue to grow. Recovering demand, accommodative monetary policy and improving financing conditions should boost investment. Improving profits and the need to replace capital after years of subdued fixed capital formation should also support total investment going forward. However, deleveraging needs and a still unfriendly business environment in some countries, as well as subdued potential growth prospects, may dampen investment growth. In addition, uncertainty related to the European Union's future relations with the United Kingdom and its potential implications for the euro area economy might weigh on the investment outlook.

Looking forward, the role of structural policies in fostering investment remains crucial. Policies affecting the regulatory environment, improving competition in product markets, favouring labour flexibility and supporting debt deleveraging and credit growth via more effective insolvency frameworks are critical to provide a long-term boost to business investment.