

Box 2

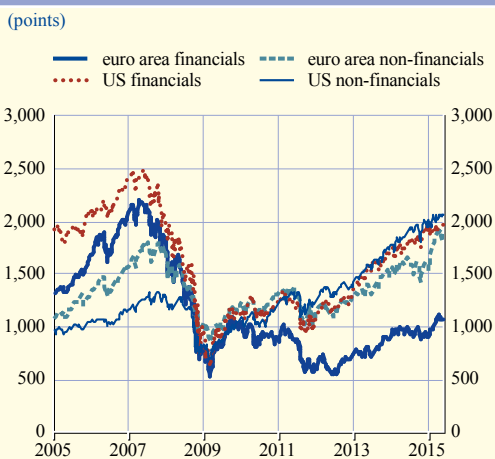
RECENT EQUITY PRICE DEVELOPMENTS IN THE EURO AREA AND THE UNITED STATES

Despite recent increases, euro area equity prices remain slightly below the peaks reached prior to the financial crisis. Euro area equity prices have been regaining lost ground since mid-2012, albeit against the backdrop of a subdued outlook for growth. This upward trend was temporarily halted during the second half of 2014, when concerns about a double-dip recession suppressed euro area stock prices (see Chart A). In contrast with developments in the euro area, the overall equity price index in the United States is well above its pre-crisis peak level (see Chart B).

Both in the euro area and in the United States, financial stocks have clearly been underperforming vis-à-vis non-financial stocks. A more detailed sectoral breakdown reveals that the price increases for non-financial stocks have been both stronger and more broadly based across economic sub-sectors in the United States than in the euro area (see Chart B). This can primarily be explained by the fact that the realised return on equity, a measure of profitability, has been higher in the United States than in the euro area for the past five years. Furthermore, over the same period earnings announcements in the United States have largely surprised on the positive side, whereas they have generally fallen short of market expectations in the euro area.

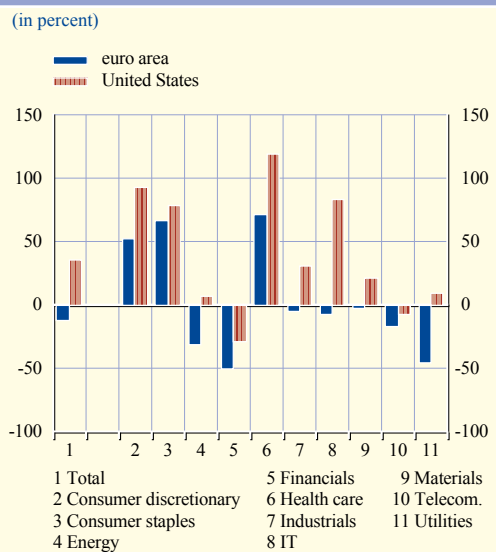
Following the announcement of the ECB’s expanded asset purchase programme (APP) in January 2015, euro area equity prices have increased strongly. They have risen by more than 17% since the start of the year and have been broadly based across financial and non-financial stock,

Chart A US and euro area equity prices



Sources: Thomson Reuters and ECB calculations.
Notes: Data refer to Morgan Stanley Capital International sectoral equity prices. The latest observation is for 29 May 2015.

Chart B Equity prices vis-à-vis July 2007 pre-crisis peak



Sources: Thomson Reuters and ECB calculations.
Notes: Data refer to Morgan Stanley Capital International sectoral equity prices. US equity prices reached their peak in October 2007, but that peak was only slightly higher than the level in July. For the sake of simplicity, the euro area peak of July 2007 has been taken as the common peak date. The latest observation is for 29 May 2015.

Chart C Price developments following
the expanded APP announcement

(re-based: Jan. 2015=100)

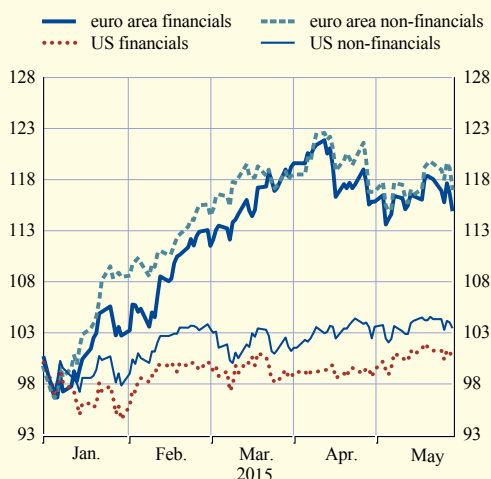
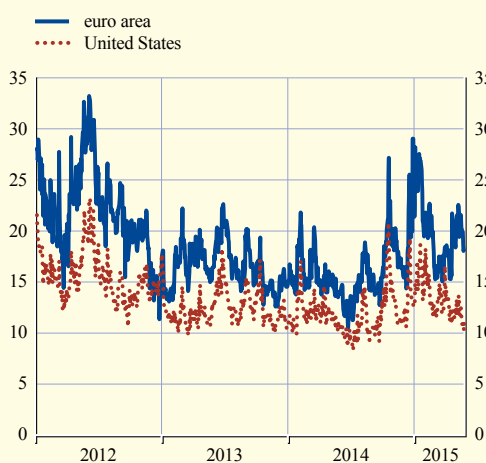
Sources: Thomson Reuters and ECB calculations.
Note: The latest observation is for 29 May 2015.

Chart D Stock market volatility

(in percent)

Source: Thomson Reuters.
Note: The latest observation is for 29 May 2015.

as well as jurisdictions. This contrasts with developments in the United States, where equity indices have remained largely flat since the start of the year (see Chart C).

Volatility in euro area equity markets also declined following the announcement of the expanded APP. Before the announcement of the expanded APP, euro area stock market uncertainty, as measured by implied volatility, had been strongly driven by increased risk aversion associated with the political uncertainties in Greece. Stock market uncertainty in the euro area spiked around the middle of October as political tensions in Greece unfolded, and once more in mid-December when it became apparent that discussions in the Greek parliament were not leading to a resolution of the political impasse (see Chart D). Following the announcement of the expanded APP, volatility declined.

Since mid-April volatility in euro area equity markets has increased amid increased volatility in euro area sovereign bond markets. The heightened volatility in euro area bond markets in mid-April predominantly reflected a strong increase in yields at the longer end of the yield curve for euro area government bonds. This increase mainly reflected a technical correction from the strong decline recorded following the initial phase of implementation of the expanded APP. The sell-off in bonds may also have been exacerbated by investors' herding behaviour in an environment of deteriorating liquidity conditions.

A dividend discount model can be used to further identify the recent drivers of equity prices. In this model, the stock price is the discounted value of all future dividends (D_t) and the discount factor is equal to the risk-free rate (r), plus some compensation for the risks taken by investors, i.e. the equity risk premium (ERP), such that:

$$P = E \left\{ \sum_{t=1}^{\infty} \frac{D_t}{(1 + r + ERP)^t} \right\}$$

In order to render this model operational, it is necessary to form assumptions on the future path of dividends. Following the model proposed by Fuller and Hsia¹, it can be assumed that dividend growth will develop in three stages. In the first stage, which is assumed to last for four years, dividends are expected to grow at a rate of g_s . The second stage is an interim period (assumed to last for eight years) where dividend growth is expected to adjust in a linear fashion to a constant long-term steady-state growth rate, g_L , which is assumed to prevail throughout the third infinite stage. Under these assumptions, Fuller and Hsia show that equity prices can be approximately computed by

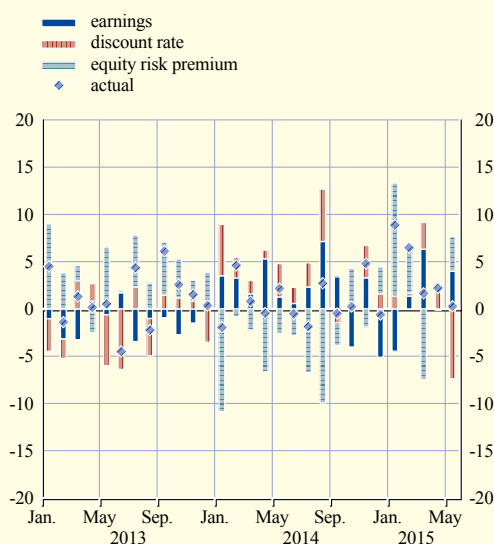
$$P = D \frac{(1 + g_L) + 8(g_s - g_L)}{r + ERP - g_L}$$

It is assumed that g_s is equivalent to analysts' earnings-per-share growth forecasts, while g_L is approximated by the future long-term GDP growth rate reported by Consensus Economics.²

The increase in euro area equity prices recorded during the first few months of 2015 has been primarily driven by increased risk appetite and lower discount rates. The analysis of the dividend discount model shown in Charts E and F reveals that, for most of 2014, the positive impact on equity prices from improvements in earnings expectations and reductions in the discount factor was countered by heightened risk aversion (measured as an increase in the equity

Chart E Decomposition of changes in euro area non-financial corporation stock prices using the dividend discount model

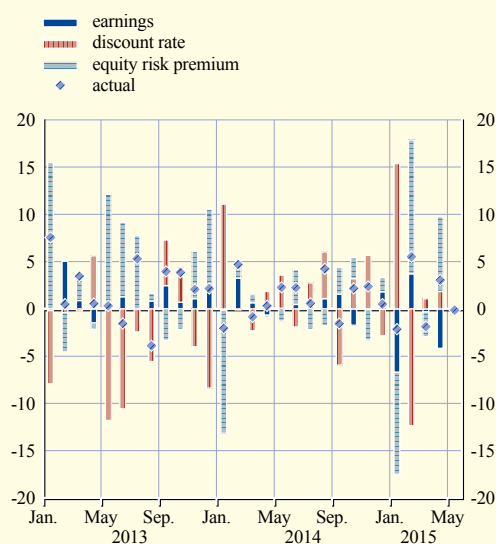
(percentages and percentage points contributions; month-on-month changes)



Sources: Thomson Reuters and ECB calculations.

Chart F Decomposition of changes in US non-financial corporation stock prices using the dividend discount model

(percentages and percentage points contributions; month-on-month changes)



Sources: Thomson Reuters and ECB calculations.

1 See Fuller, R. J. and Hsia, C., "A Simplified Common Stock Valuation Model", *Financial Analysts Journal*, Vol. 40, September-October 1984, pp. 49-56.

2 In this box, g_s is set equal to I/B/E/S (Institutional Brokers Estimate System) analysts' three-to-five-year ahead ("long-term") earnings-per-share growth forecasts. The risk-free rate, r , is assumed to be the ten-year overnight index swap rate. Given the current level of the equity price P and the level of dividends D , the equity risk premium ERP can be computed from the formula.

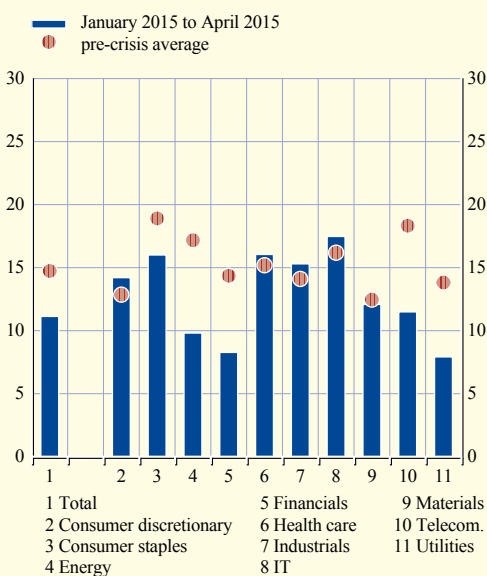
risk premium) that thus kept stock prices broadly unchanged. This scenario was reversed in January and February 2015, following the announcement of the expanded APP, which triggered a reduction in risk aversion, thereby strongly boosting equity prices. In addition, model estimates suggest that at least part of the surge in equity prices at the beginning of the year was related to a depreciation of the euro and weak oil prices.

This was in contrast to the situation in the United States, where weak economic data in January 2015 was also reflected in a reduction in earnings expectations and only a slight increase in stock prices (see Chart F). The impact on stock prices was kept relatively contained only because the weak data releases led to a reduction in the discount rate, owing to the likely postponement of a tightening in monetary policy. The recent bout of volatility in euro area bond markets, which has resulted in an increase in the discount rate, is reflected in the subdued performance of euro area stock prices in May 2015.

Looking ahead, long-term growth prospects in the euro area remain relatively muted and continue to constrain the performance of equity prices in the euro area vis-a-vis those in the United States. Although recent macroeconomic data releases have been better than expected, the prospects for a revival in euro area potential output growth remain weak. This has been weighing on analysts' expectations for long-term earnings growth, with long-term expectations for the return on equity remaining much lower in the euro area than in the United States (see Charts G and H). They also remain below pre-crisis average levels.

Chart G Euro area expected return on equity more than two years ahead

(in percent)

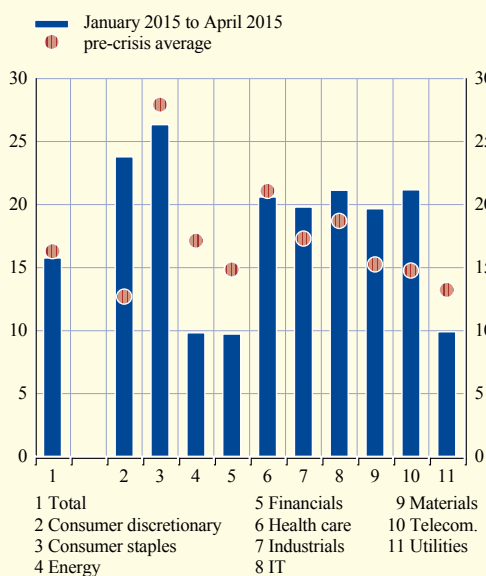


Sources: Thomson Reuters and ECB calculations.

Notes: The return on equity is computed from the ratio of the price earnings and price to book value series from the Morgan Stanley Capital International indexes. The pre-crisis average refers to the period from January 1999 to June 2007.

Chart H United States expected return on equity more than two years ahead

(in percent)



Sources: Thomson Reuters and ECB calculations.

Note: The return on equity is computed from the ratio of the price earnings and price to book value series from the Morgan Stanley Capital International indexes. The pre-crisis average refers to the period from January 1999 to June 2007.

Overall, in spite of the steady increase in euro area stock prices since mid-2012, and the more recent sharp increase following the expanded APP announcement, euro area stock prices remain at levels below their pre-crisis peak. Price earnings ratios remain close to or below their long-run averages across most sectors. Vis-a-vis the United States, euro area equity prices continue to underperform as concerns about the potential growth outlook for the euro area continue to dampen earnings expectations.