

Box 5

STOCK PRICES AND ECONOMIC GROWTH

Euro area stock prices have risen considerably since June this year (see Chart 20 in Section 2.6), and all sectors have contributed to this rise. In early October the Dow Jones EURO STOXX stood at around 250 points, compared with 209 points in early June. The question is whether these rises in stock prices anticipate an economic recovery. While stock prices often have leading indicator properties for economic growth, it is well known that they are much more volatile than the real economy and might provide false signals about economic growth. Moreover, stock price changes are not necessarily driven by economic fundamentals. This box describes the relationship between stock prices and economic growth from a theoretical and empirical perspective.

Theory

According to common theory, the price of a share equals the sum of all future dividend payments discounted to its present value. Dividends are often replaced by earnings, assuming a constant dividend pay-out ratio. The discount factor can be split into a risk-free component and an equity risk premium. This present value model for the share price implies a forward-looking passive, or indicator role for stock prices. Higher stock prices reflect an increase in the discounted expected earnings, providing potentially useful information about future economic growth.

Stock prices also play an active role in the economy through various channels. Higher equity prices provide an extra stimulus for households and firms that own, whether directly or indirectly, for example via pension funds, shares via positive wealth effects. Furthermore, the stock market is seen as a general measure of the state of the economy through which stock prices affect the real economy via a confidence channel. An increase in stock prices provides a stimulus to the confidence of households and firms and reduces the uncertainty they have about their future economic situation. Investment also benefits from higher stock prices via a lower cost of equity capital. Firms with a stock exchange notation can finance investment more cheaply by issuing new shares. Higher stock prices also increase the ratio between the market value of installed capital and the replacement cost of capital. An increase in this ratio, also known as Tobin's Q, encourages firms to invest more in capital. Higher stock prices also reflect an increase in the expected profits and thus in the sources of internal finance that are ultimately available for investment. This internal financing channel plays a particularly important role when external finance is not available or is only available against high cost. Another mechanism, through which stock prices affect the availability and costs of credit, is that higher stock prices improve the financial position of households and firms. This, in turn, allows households and firms to borrow more easily and cheaply and is known as a balance sheet channel. Finally, the equity risk premium provides an insight into the degree of risk aversion in the economy which, in turn, can affect the real economy. This channel works through the perceived riskiness of equity and the risk compensation desired by investors.¹

Empirics

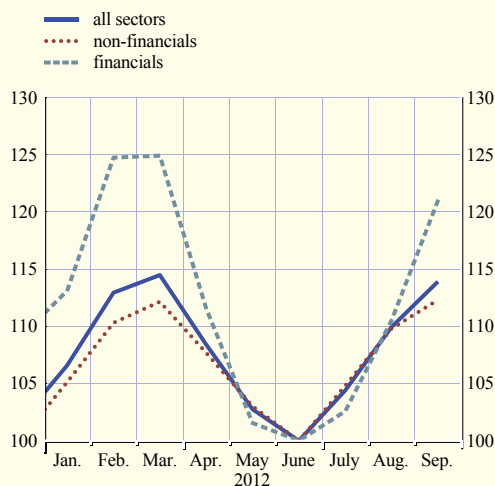
Despite a vast empirical literature about the predictive content of stock prices for economic activity, there is no convincing conclusion. Some studies provide evidence in favour of a positive relationship between stock prices and economic growth, whereas others argue that this relationship has broken down.² A likely explanation for a potential loss of predictive content is more prolonged bubbles in the stock markets. Stock prices can rise beyond their fundamental or intrinsic value if they are (temporarily) driven by non-fundamental factors.

1 See the box entitled "Risk-taking and risk compensation as elements in the monetary policy transmission process", *Monthly Bulletin*, ECB, August 2008.

2 For example, using one century of US data, Schwert, G.W. in "Stock returns and real activity: a century of evidence", *Journal of Finance* 45(4), 1990, pp. 1237-57, shows that stock prices contain useful information about future economic growth, whereas Binswanger, M. in "Does the stock market still lead real activity? An investigation for the G-7 countries", *Financial Markets and Portfolio Management* 15(1), 2001, pp. 15-29, argues that this relation has broken down in the 1980s and 90s. In a similar vein, Stock J.H. and Watson M.W. in "Forecasting output and inflation: the role of asset prices", *NBER Working Paper Series* 8180, 2001, show in their seminal paper that certain asset prices predict output growth in some countries in some periods.

Chart A Stock prices in the euro area

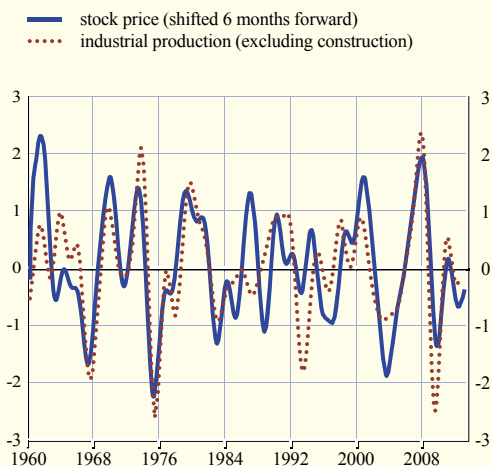
(index: June 2012 = 100; monthly averages of daily data)



Source: Datastream.

Chart B Stock price and industrial production cycles in the euro area

(standardised percentage deviation from trend)



Sources: Datastream, Eurostat, Global Financial Data and ECB calculations.

Notes: Cyclical components are derived by applying a one-sided band pass filter. For more details, see the box entitled "The measurement and prediction of the euro area business cycle", *Monthly Bulletin*, ECB, May 2011. The latest observations for industrial production are from July 2012, and for stock prices from September 2012.

One can mitigate this distortion by analysing the predictive content of the fundamental component of stock prices: dividends or earnings and the factor by which future dividends or earnings must be multiplied in order to obtain the present value. The latter is better known as the discount factor. From this fundamental perspective, stock prices tend to contain information about future economic growth.³ For example, a stock price fundamental in support of a forthcoming turn in economic growth is the recent fall in the discount factor.

Another possibility is to analyse stock prices at a sector level, knowing that not every sector necessarily adjusts to the business cycle to the same extent. Notwithstanding the fact that all sectors have contributed to the rise in the overall stock price index in the euro area since June this year, Chart A shows that stock prices of the euro area financial sector, a sector which is known to be quite pro-cyclical, have increased markedly.⁴

Another method to extract the predictive power of stock prices for the real economy is to relate the cyclical component of the stock price with that of industrial production (excluding construction). The correlation between stock prices (shifted forward by six months) and the business cycle, as represented by the industrial production cycle, is 0.70 (see Chart B). Indeed, by focusing on the right-hand tail of this chart one could conclude that the stock price cycle currently signals a

3 For evidence on industrial countries, see de Bondt, G.J., "Predictive content of the stock market for output revisited", *Applied Economics Letters* 16(13), 2009, pp. 1289-94 and, for euro area and US evidence, Table 5 in Andersson, M., D'Agostino, A., de Bondt, G.J. and Roma, M., "The predictive content of sectoral stock prices: a US-euro area comparison", *Working Paper Series*, No 1343, ECB, Frankfurt am Main, May 2011. For evidence in favour of fundamental-driven equity wealth effects, see de Bondt, G.J., "Equity wealth effects: fundamental or bubble-driven?", *Applied Economics Letters* 18(7), 2011, pp. 601-05.

4 For evidence in favour of the financial sector as the sector containing the most promising information content for future GDP growth in the euro area as well as in the United States, see Andersson, M., D'Agostino, A., de Bondt, G.J. and Roma, M., op. cit.

recovery in the euro area growth cycle. However, Chart B also shows that the stock price cycle did provide false signals in the past. A notable deviation between the two cycles is, for example, the period between 1986 and early 1987, when the industrial production cycle indicators declined but the six-month leading stock price cycle picked up strongly and thus provided a clear positive signal for the growth cycle.

Conclusions

In sum, there are several factors supporting the view that rises in stock prices may anticipate economic growth, but important caveats apply. From a theoretical perspective, owing to their passive forward-looking indicator role stock prices have information content for future economic growth because they are the outcome of discounted future dividends. Stock prices also play an active role via a wide spectrum of channels through which they affect economic growth. Empirically speaking the predictive content of stock prices for economic growth is, however, less clear-cut.