

## Box 5

### THE MACROECONOMIC ENVIRONMENT AND FINANCIAL STABILITY: EVIDENCE FROM PAST BANKING CRISES

The macroeconomic environment can be an important factor underlying the stability of the financial system, affecting the creditworthiness of firms and households, the buoyancy of financial markets, and the profitability and stability of financial institutions. As a corollary, the macroeconomic environment can also be an important exogenous source of risk for financial stability: an adverse shock – or constellation of shocks – can directly impair households' and firms' ability to honour their financial obligations. It may also be an indirect source of imbalances that build up endogenously over time. Although the form of such vulnerabilities varies – including excessive investment, debt accumulation, rapidly rising asset prices, or widening current account deficits – the mechanism tends to be similar. It is usually associated with a misperception of future returns or risk that leads to an inter-temporal misallocation of resources and a build-up of imbalances that weakens the resilience of the system to future adverse disturbances.

In practice, the challenges of identifying such vulnerabilities *ex-ante* can be significant. Theory may not offer ready answers, for example, in distinguishing when a credit expansion has become a credit boom. In some instances, these vulnerabilities are evident only in retrospect. Given those challenges, a growing body of literature has looked at past banking crises in an attempt to identify a common set of fault lines in episodes of financial distress.<sup>1</sup> This box draws on some of that research and assesses the current state of the euro area against those past experiences.

One approach in the literature is to use past episodes to highlight a set of stylised facts across countries experiencing financial distress. A recent example is provided by Reinhart and Rogoff (2008) who find qualitative parallels across a number of indicators in countries experiencing banking crises.<sup>2</sup> A comparison of banking crises in advanced economies over the past three decades suggests that developments follow the same broad path in the years prior to a crisis: rapidly rising home and equity prices, acceleration in capital inflows, a sustained debt accumulation and, shortly before the crisis hits, slowing economic growth. Reinhart and Rogoff analyse the current situation of the United States, which in recent years has also experienced a large accumulation of debt, rapid increases in asset prices and persistent current account deficits (see Charts A and B). In contrast to the United States, the euro area does not reveal such consistent similarities, but it nonetheless highlights some of the potential vulnerabilities for the euro area which have been commented on in this and previous FSRs. As discussed in Section 3, in common with asset prices

1 One example is ECB (2005), "Indicators of financial distress in mature economies", *Financial Stability Review*, June.

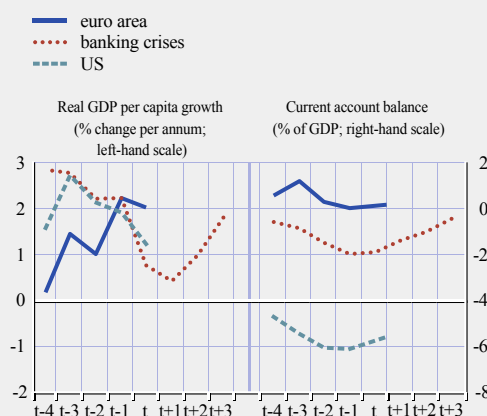
2 C. Reinhart and K. Rogoff (2008), "Is the US sub-prime financial crisis so different? An international historical comparison", National Bureau of Economic Research Working Paper No. 13761, January 2008. C. Detken and F. Smets (2004), "Asset Price Booms and Monetary Policy" in H. Siebert (ed.), *Macroeconomic Policies in the World Economy*, Springer: Berlin, and R. Adalid and C. Detken (2007), "Liquidity shocks and asset price boom/bust cycles", ECB Working Paper No. 732, analyse asset price boom/bust episodes, which are in many cases associated with banking crises. See also C. Goodhart and B. Hoffman (2008), "House prices, money, credit and the macroeconomy", ECB Working Paper No. 888, for similar evidence.

**Chart A** Recent developments in US and euro area real equity prices and real residential property prices compared with past banking crises



Sources: OECD, IMF and ECB calculations based on national data. Note: The indicators are deflated by consumer prices. For the United States and the euro area, period t represents 2007. For the average of past banking crises, period t represents the year of onset of the financial crisis.

**Chart B** Recent developments in US and euro area real GDP growth and current account balances compared with past banking crises



Sources: Eurostat and ECB calculations. Note: For the United States and the euro area, period t represents 2007. For the average of past banking crises, period t represents the year of onset of the financial crisis.

internationally, euro area equity indices had broadly risen until the onset of financial turmoil in 2007. And, as described elsewhere in Section 2, while aggregate euro area residential property price growth moderated recently, residential property prices in the euro area have also shown strong increases, similar in scale to past episodes of financial instability (see Chart A).

A more quantitative approach attempts to use these stylised facts as potential early warning indicators. Borio and Lowe (2002) assessed the potential for developments in asset prices and credit to provide quantitative indications of the accumulation of possible structural vulnerabilities.<sup>3</sup> As macro-financial vulnerabilities tend to build up over an extended period, rather than analysing developments in a particular year, this approach focused on cumulative processes. Vulnerabilities are identified by examining the “gap” or deviation of the credit-to-GDP ratio and equity prices from a “trend”.<sup>4</sup> Balancing the need for an indicator which will identify a high proportion of crises while also minimising the number of false alarms, Borio and Lowe examine these “gaps” during past crisis periods and select thresholds – either for each indicator individually or in combination – which, when breached, may provide a useful signal about the current potential for financial turmoil over a specified horizon.<sup>5</sup>

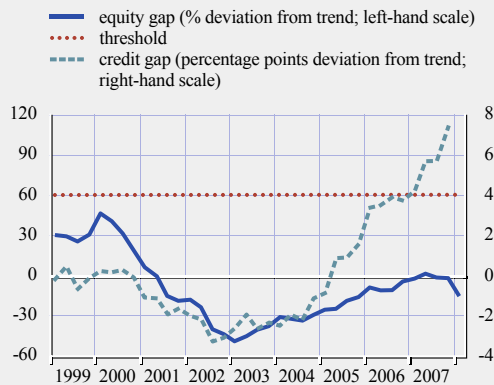
As highly reduced form and summary measures, with no explicit modelling of the links between macroeconomic imbalances and financial instability, and a crude statistical definition of “trend”, these indicators have limitations. They are perhaps best considered as one element

3 C. Borio and P. Lowe (2002), “Asset prices, financial and monetary stability: exploring the nexus”, BIS Working Paper No. 114; and C. Borio and P. Lowe (2004), “Securing sustainable price stability: should credit come back from the wilderness?”, BIS Working Paper No. 157.

4 The trend is estimated recursively using an Hodrick-Prescott filter on quarterly data (using a setting of lambda, the parameter that controls the smoothness of the series, equal to 400,000 to capture a smoothed trend). A broader indicator of asset price imbalances would incorporate property prices, which have historically played a role in banking crises, but owing to data limitations, Borio and Lowe rely exclusively on equity prices.

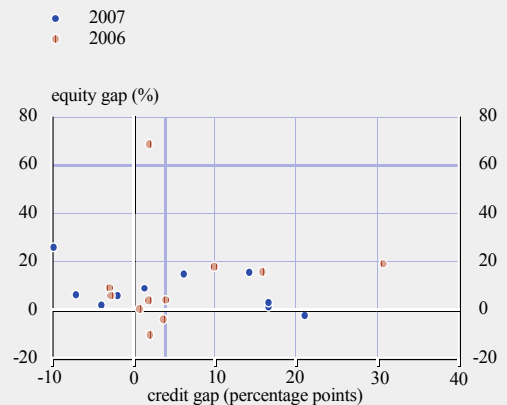
5 Borio and Lowe consider horizons ranging from three to five years. Adalid and Detken (2007) have a similar approach and find that consumer price deflated growth in housing prices and M3-based liquidity shocks explain GDP growth following asset price booms. The stronger the accumulated growth in real estate prices and monetary liquidity, the worse the following recession.

**Chart C Credit and equity “gaps” for the euro area**



Sources: IMF and ECB calculations.  
 Note: The indicators show deviations of the private credit-to-GDP ratio and real equity prices from ex-ante, recursively calculated Hodrick-Prescott trend. For information on thresholds (60% for the equity “gap” and 4 percentage points for the credit “gap”), see Borio and Lowe (2002 and 2004).

**Chart D Credit and equity “gaps” in selected euro area countries**



Sources: IMF and ECB calculations.  
 Note: The indicators show deviations of the private credit-to-GDP ratio and real equity prices from ex-ante, recursively calculated Hodrick-Prescott trend. Each point represents a euro area country.

of the qualitative process which compiles a summary assessment of overall vulnerabilities. Nevertheless, in particular by combining individual indicators, they represent a means of considering different aspects of potential macroeconomic imbalances with implications for financial stability. Encouragingly for the euro area, the prognosis from these indicators is relatively good – with only tentative indications of possible vulnerabilities building up in the euro area. Although since the start of 2007 the ratio of credit to GDP in the euro area has risen above the threshold “warning” level (Chart C), real equity prices remain more subdued. They have risen in the past four years, but that followed a long period of decline after the bursting of the tech bubble of the late 1990s, and equity prices remain – on this measure – close to trend. Of course, this aggregate picture masks differences across countries, but, as Chart D shows, while several euro area countries have seen widening credit “gaps” and some others a rapid increase in equity prices, no country has registered warnings in both indicators.