

Box 8

OUTPUT VOLATILITY IN THE EURO AREA

Since the trough in activity in 2009 the euro area has seen substantial changes in the pace of real GDP growth from quarter to quarter. For example, strong output growth in the first quarter of 2011 was followed by a sharp moderation in the pace of expansion in the second quarter. Similar variation in the quarter-on-quarter rates of growth was observed in 2010. Some country and sector-specific factors underlie this volatility. This box assesses whether the pattern of output growth has been unusual, comparing the recent crisis with previous banking crises in advanced economies.

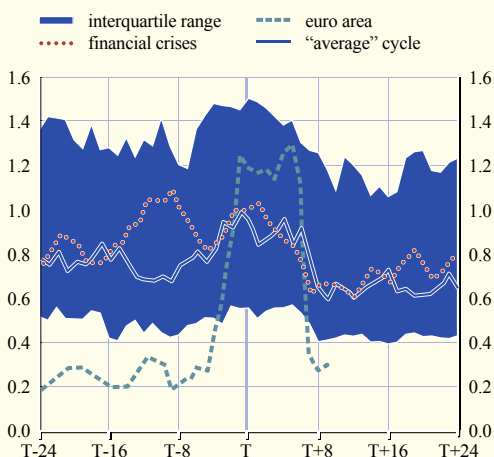
Output volatility following financial crises

Prior to the recent financial crisis there had been five systemic banking crises in advanced economies: in Spain in the late 1970s, Norway in the late 1980s, Finland and Sweden in the early 1990s and Japan during the 1990s.¹ Charts A and B provide different perspectives on the growth profile following the crises. Chart A shows rolling estimates (over an eight-quarter horizon) of the standard deviation of GDP quarter-on-quarter growth rates before and after the recessions

¹ For a definition of systemic crises, see Laeven, L. and Valencia, F., "Systemic Banking Crises: A New Database", *Working Paper Series*, No 08/224, IMF, 2008. See also Claessens, S., Kose, M.A. and Terrones, M., "What happens during recessions, crunches and busts?", *Working Paper Series*, No 08/274, IMF, 2008. See also the IMF's World Economic Outlook of April 2009.

Chart A GDP volatility across cycles

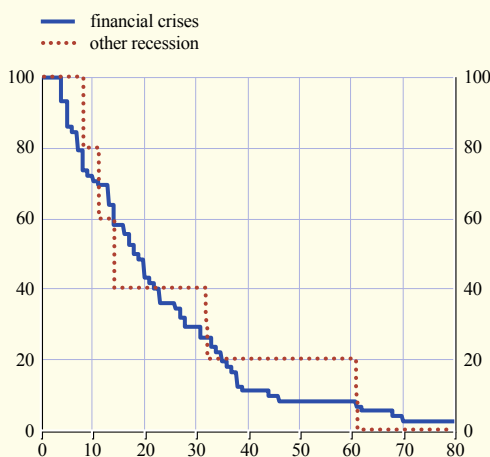
(eight-quarter rolling estimates of standard deviations of quarter-on-quarter GDP growth¹; T = cyclical trough)



Sources: OECD, Eurostat and ECB staff calculations.
1) The x-axis measures quarters before and after the trough (T).

Chart B Length of expansions following financial crises

(percentages)



Sources: OECD, Eurostat and ECB staff calculations.
Note: The x-axis measures the length of expansion in quarters. Each line shows the proportion of the sample of cycles lasting up to a given number of quarters. Economic cycles are measured for a sample of advanced economies since 1970 and are defined based on movements in real GDP.

that followed the crises, aligned around the recession trough.² To provide a comparison with cycles not associated with financial crises, the average cyclical path, found by averaging across countries and cycles in a sample of advanced economies since 1970, is also shown. Recent euro area developments are also shown. Chart B illustrates the length of expansions following financial crises, showing the number of quarters before the economy fell back into recession (defined as two periods of negative quarter-on-quarter growth) across the sample of cycles. Overall, the charts suggest that the profile of growth following periods of severe financial turmoil does not differ considerably from that of other recoveries: there is little evidence that GDP was significantly more volatile in the aftermath of the five systemic episodes, and expansions following financial crises were typically not shorter than those following other recessions.

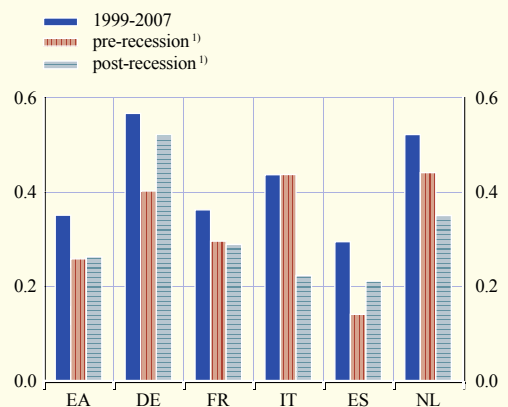
At the same time, even if the length of the expansions is not different, economies may experience more periods of negative growth following a crisis. That would be consistent with the tendency for a decline in the average pace of growth following banking crises³ – the same volatility around a lower average growth rate would tend to mean more observations of negative quarter-on-quarter growth. Indeed, this appears to be the case: in the five years after the crises, countries saw a slightly higher number of quarterly GDP falls than in the same period before the recession.

Recent volatility in the euro area

For most euro area countries, the recession did not end until 2009, providing only a relatively small window to judge post-crisis volatility in the euro area. In general, the volatility of GDP growth (measured by the standard deviation of quarterly growth rates) has not been noticeably higher in euro area countries since then. GDP volatility increased substantially in the largest euro area countries during the recession, reflecting the deep trough in output in many countries, but has since fallen back. Euro area output volatility since the end of the recession (in the second quarter of 2009) has been broadly similar to the two-year period before the recession and lower than the average volatility since the beginning of monetary union (see Chart C). The standard deviation of output volatility has also been more modest in most large euro area countries since the end of

Chart C GDP volatility in large euro area countries

(standard deviations of quarter-on-quarter growth rates)



Sources: Eurostat and ECB staff calculations.

1) Pre-recession refers to the period from Q1 2006 to Q4 2007; post-recession refers to the period from Q3 2009 to Q2 or Q3 2011 depending on the availability of data.

2 For a more in-depth discussion of economic developments following financial crises, see the article entitled “The latest euro area recession in a historical context” in the November 2009 issue of the Monthly Bulletin. For each country, economic cycles are defined based on movements in real GDP using an algorithm developed in Bry, G. and Boschan, C., “Cyclical Analysis of Time Series: Selected Procedures and Computer Programs”, *Technical Paper*, No 20, NBER, 1971; and Harding, D. and Pagan, A., “Dissecting the cycle: a methodological investigation”, *Journal of Monetary Economics*, Vol. 49, pp. 365-381, 2002.

3 See Furceri, D. and Mourougane, A., “The Effect of Financial Crises on Potential Output: New Empirical Evidence from OECD Countries”, *Working Paper Series*, No 699, OECD, 2009.

the recession than in the past. The exception is Germany, where output has been more volatile. But that mainly reflects the impact of two very cold winters in 2010 and 2011, which resulted in significant changes in construction investment from quarter to quarter. Excluding construction sector output, volatility in Germany since the end of the recession in mid-2009 has been below the average between 1999 and 2007.

To sum up, previous experience suggests that output growth is typically not more volatile following financial crises, although there has been a tendency for more frequent instances of negative quarterly growth during the recovery phase. In general, the volatility of GDP growth has not been noticeably higher in most euro area countries since the end of the recent recession. As in previous financial crises, however, the pace of the recovery has varied across countries and has been relatively subdued for the euro area overall.