

## Box 2

### The relationship between business and financial cycles

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Boom-bust cycles in financial variables such as credit volumes and residential property prices play an important role in the build-up of financial instability and subsequent financial crises.<sup>10</sup> Against this background, one of the key goals of macroprudential policy is to attenuate such boom-bust cycles, often termed the financial cycle. To inform such policies, various recent studies have presented estimates of cyclical fluctuations in financial indicators for major advanced economies.<sup>11</sup>

Notwithstanding the expansion of the literature to date, the evidence on the co-movement of financial cycles with the business cycle and differences in cyclical characteristics across countries is still limited. The relationship between business and financial cycles has implications for the policy mix at the aggregate euro area level, while differences in the properties of financial cycles provide a case for country-specific policies.

Multivariate structural time series (STS) models are a powerful tool to gain an insight into the interplay of series associated with financial and business cycles.<sup>12</sup> These models are designed to decompose multiple series into trend and cyclical components. They have several advantages compared with the non-parametric univariate filters that have been used in most earlier studies. Non-parametric filters require a priori assumptions about the dynamic properties of cycles and are applied separately to each individual series, while multivariate STS models permit researchers to estimate the dynamic properties of both trend and cyclical components jointly for all series. This has the advantage of estimation accuracy by reducing the risk of extracting spurious cycles.

Chart A shows estimates of the cyclical fluctuations in GDP, total credit volumes and residential property prices for the United States and three major European economies (Germany, France and the United Kingdom). In line with earlier studies, the multivariate STS model finds large medium-term cyclical components in the two financial series. However, there are also substantial differences in cyclical characteristics across countries. Germany stands out with very small cycles with a length of about seven years. For the remaining countries, the average cycle length in both financial series is estimated at 13 to 15 years, compared with 8 to 13 years for GDP cycles. Another notable feature is the large amplitude of credit and residential property price cycles in the United Kingdom, a country with a high rate of private home ownership.

Generally, differences in the cyclical characteristics of residential property prices correspond quite closely to differences in the rates of private home ownership: cycles are larger and longer for countries with high home-ownership rates (see Chart B). The same finding holds for credit volumes.

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<sup>10</sup> See for example Jordà, Ò., Schularick M. and Taylor A., "The Great Mortgaging: Housing Finance, Crises, and Business Cycles", *Working Paper Series*, No 20501, NBER, 2014.

<sup>11</sup> Composite financial cycle indicators for euro area countries are found in Schüler, Y., Hiebert, P. and Peltonen, T., "Characterising the financial cycle: a multivariate time-varying approach", *Working Paper Series*, No 1846, ECB, 2015; see also Drehmann, M. et al., "Characterising the Financial Cycle: Don't Lose Sight of the Medium Term", *Working Paper Series*, No 380, BIS, 2012, and Special Feature B, "Capturing the financial cycles in euro area countries", *Financial Stability Review*, ECB, November 2014.

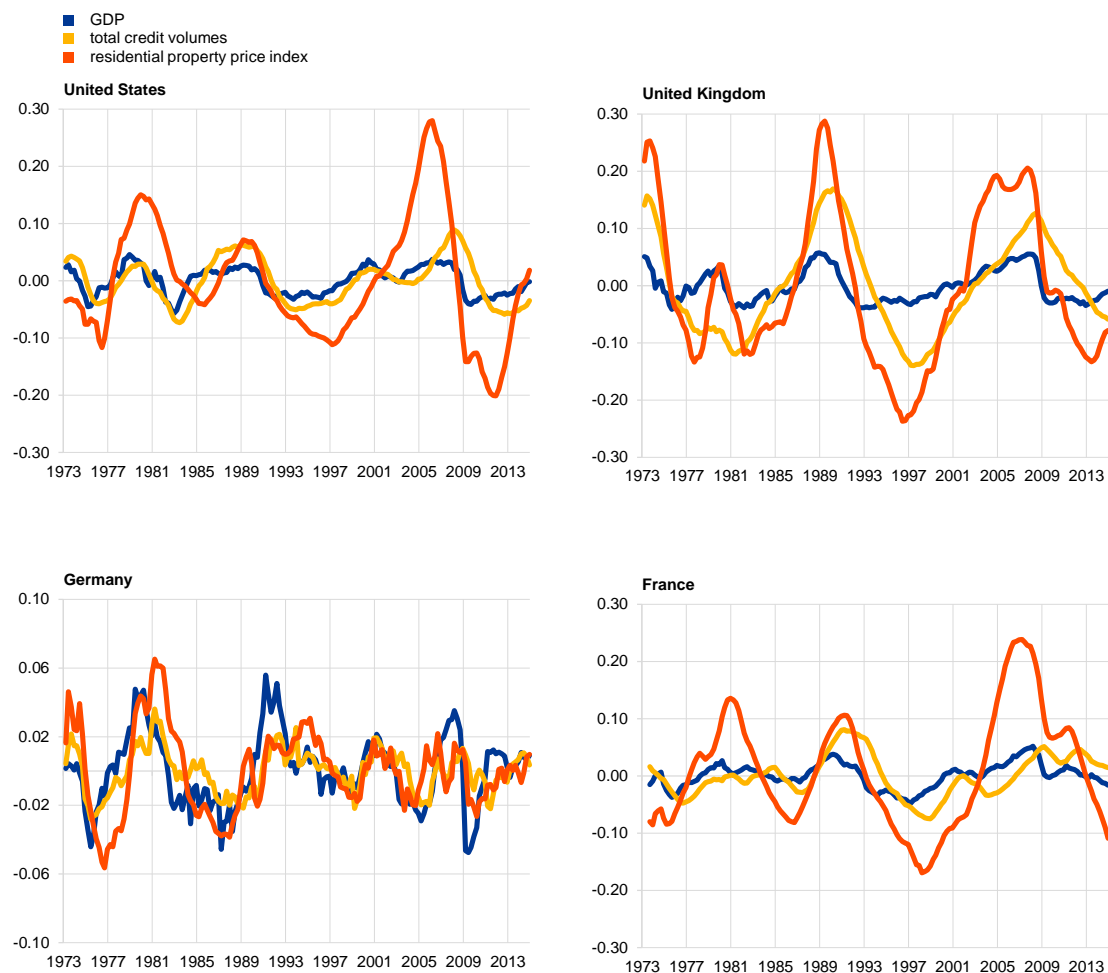
<sup>12</sup> Rünstler, G. and Vlekke, M., "Business and financial cycles: an unobserved components models perspective", mimeo, ECB, 2015. The study includes the United States, the United Kingdom, Germany, France, Italy and Spain. The model is an extended version of Rünstler, G., "Modelling Phase Shifts Among Stochastic Cycles", *Econometrics Journal*, Vol. 7, 2004, pp. 232-248.

## Chart A

Cycles in credit volumes and residential property prices are closely aligned with a medium-term component in GDP cycles

### Cycles in GDP, real total credit volumes and residential property prices

(1973-2014; percentage deviations from trend (\*100))



Source: Rünstler and Vlekke (2015).

Notes: Data on GDP were obtained from the OECD Main Economic Indicators. Data on total credit volumes and residential property price indices were taken from two BIS databases. All variables are deflated with the GDP deflator.

Furthermore, medium-term fluctuations in credit, residential property prices and GDP cycles are closely aligned (see Chart A). Cross-correlations are in a range of 0.5 to 0.9. The cycles in residential property prices move contemporaneously with GDP cycles, while credit cycles tend to lag the latter by about one to three years. With the exception of Germany, booms arise in the late 1970s, the early 1990s and the period before the recent financial crisis. At the same time, the estimates show some de-synchronisation of fluctuations between the series at business cycle

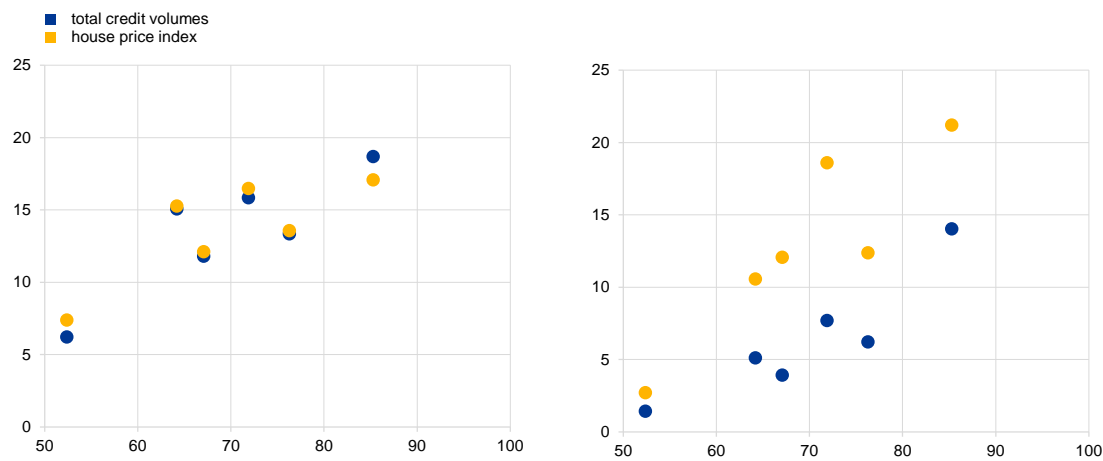
frequencies: shorter-term fluctuations in economic activity are reflected in the financial series – in particular in residential property prices – only to a limited extent.<sup>13</sup>

### Chart B

Differences in the length and size of cycles in credit volumes and residential property prices correspond to private home-ownership rates

Private home-ownership rate (x-axes), cycle length (y-axis left-hand chart) and standard deviations (y-axis right-hand chart)

(years; percentages)



Source: Rünstler and Vlekke (2015).

Note: Data on private home-ownership rates are from the FRED database for the United States, and from Eurostat for the United Kingdom, Germany, France, Italy and Spain.

All in all, while the estimates suggest that credit, house prices and real activity are closely linked over the medium term, there are important divergences between financial cycles (i.e. in credit volumes and a broad set of asset prices) and cycles in real economic activity at the shorter business cycle frequencies. This, along with the presence of country-specific factors, suggests a need for a country-specific application of macroprudential policies moving beyond system resilience, aimed not only at stemming financial cycles but also limiting economic booms and busts.

<sup>13</sup> This finding is also supported by Schüler et al (2015), who find concordance of financial and business cycles only for two-thirds of turning points. On the coincidence of troughs in credit and house price cycles with deep recessions, see Claessens, S., Kose, M. and Terrones, M., "How Do Business and Financial Cycles Interact?", *Journal of International Economics*, Vol. 87(1), 2012, pp. 178-190.