Box 1
The prevalence of vulnerable firms in the euro area

The pre-crisis period was characterised by a debt-financed investment boom that ultimately proved unsustainable. Excessive borrowing coupled with overinvestment in some euro area economies in the run-up to the global financial crisis has rendered parts of the euro area non-financial corporate sector vulnerable to shocks. As the financial crisis unfolded and macroeconomic conditions deteriorated, vulnerabilities that were looming in corporate balance sheets became increasingly apparent, with many firms no longer able to service their financial obligations.

The health of non-financial firms is vital from a financial stability perspective, not least as debt servicing problems of firms may weigh on bank balance sheets via deteriorating asset quality. These banking sector problems, if unresolved, can incentivise banks to "evergreen" loans in order to avoid the realisation of losses.[9] If interest rates were to increase without an improvement in economic conditions, the interest subsidies required to keep troubled firms afloat would become more costly, which, in turn, would have an adverse impact on banks' profitability or even, in an extreme scenario, on their solvency.

Against this backdrop, this box examines the prevalence of vulnerable firms in the euro area and their ability to cope with stress, as reflected in an interest rate shock. In general, vulnerable firms are defined as those having persistent difficulties in meeting their interest payments.[10] More specifically, firms that have had an interest coverage ratio (ICR)[11] of below two

9 "Evergreening" here refers to the provision of additional credit to weak borrowers to enable them to make interest payments on outstanding credit and thus avoid or delay bankruptcy. This mechanism was first documented in the context of Japan's experience during the 1990s by Peek, J. and Rosengren, E., "Unnatural Selection: Perverse Incentives and the Misallocation of Credit in Japan", *American Economic Review*, Vol. 95(4), September 2005, pp. 1144-1166. For more recent evidence relating to Europe, see Schivardi, F., Sette, E. and Tabellini, G., "Credit Misallocation During the European Financial Crisis", *CESifo Working Paper Series*, No 6406, April 2017. Shielding troubled firms from market pressures can impose costs on healthy firms, as the congestion created by firms kept alive by their banks reduces the profits of healthy firms, which discourages market entry and investment; see Caballero, R., Hoshi, T. and Kashyap, A., "Zombie Lending and Depressed Restructuring in Japan", *American Economic Review*, Vol. 98(5), December 2008, pp. 1943-1977.

10 See McGowan, M., Andrews, D. and Millot, V., "The Walking Dead? Zombie Firms and Productivity Performance in OECD Countries", *OECD Economics Department Working Papers*, No 1372, January 2017.

for three consecutive years are classified as vulnerable for the purposes of this box. Firms' ability to cope with an interest rate shock is examined by studying the sensitivity of ICRs to a 100 basis point increase in the cost of debt. The shock is applied to 2016 financial statements and thus does not assume a concurrent improvement in macroeconomic conditions. The analysis is based on Worldscope data, which cover listed firms in the euro area only and hence do not capture the full universe of vulnerable firms.[12] Accordingly, small and medium-sized enterprises, which account for the bulk of euro area employment and may be as susceptible to vulnerabilities – if not more so – as their listed counterparts, are not covered by the analysis.

The share of vulnerable firms increased markedly during the euro area sovereign debt crisis in those countries that were more affected by it. Since the peak in 2013, however, the share of vulnerable firms in these countries has almost halved (see **Chart A**), reflecting improving economic conditions, the easing of financing costs as monetary policy accommodation measures fed through and elevated delisting rates. The share of vulnerable firms in countries that were less affected by the crisis, on the other hand, has been less sensitive to the cycle. As listed firms are subject to capital market pressure, vulnerable firms have shown a greater propensity to delist than firms not considered vulnerable. In countries that were more affected by the crisis, since 2009 13% of vulnerable firms have delisted on average per annum, compared with only 4% for normal firms. For this reason, the recorded decline in the share of vulnerable firms may partially mask a migration of vulnerable firms to the non-listed segment, which is, however, beyond the scope of this box.

A 100 basis point increase in the cost of the stock of debt is significant when compared with past experience. To put the size of the hypothetical shock into perspective, it is helpful to recall that the median cost of the stock of debt of listed non-financial corporations increased by about 80 basis points over the last tightening cycle of the ECB prior to the financial crisis, despite the much larger increase in marginal funding costs.[13]

The sensitivity of ICRs to a higher cost of debt appears rather low. In 2016 about 23% of listed firms in euro area countries that were more affected by the crisis had ICRs of less than two, compared with 17% in other euro area countries. A rise in the cost of the stock of firms' debt by 100 basis points would increase the share of firms with debt at risk by two percentage points in euro area countries that were more affected by the crisis and by one percentage point in the remainder of the euro area (see **Chart B**). Thus, ICRs of listed firms appear relatively resilient across the euro area, which is consistent with the decline in the share of vulnerable firms observed since 2013.

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11 The ICR is defined as earnings before interest, taxes, depreciation and amortisation divided by interest expenses.

12 The dataset comprises 32,290 firm-year observations from 2001 to 2016.

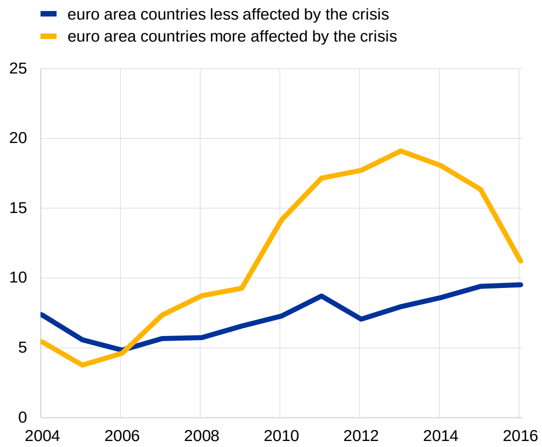
13 The ECB increased the main refinancing operations rate by 225 basis points over the two-and-a-half-year period from December 2005 to July 2008.

Chart A

The share of vulnerable firms has come down markedly since the peak in 2013

Share of listed firms with ICRs of less than two for three consecutive years

(2004-16, percentages)



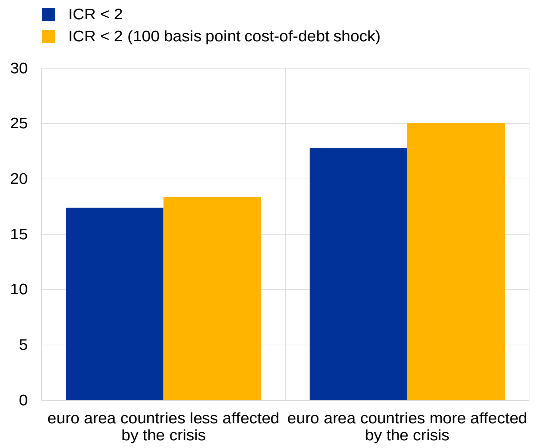
Sources: Worldscope and ECB calculations.
Notes: Firms with an ICR of less than two for three consecutive years are classified as vulnerable. Euro area countries that were more affected by the crisis include Cyprus, Greece, Ireland, Italy, Portugal, Slovenia and Spain.

Chart B

ICRs are more sensitive to a shock in countries more affected by the crisis

Share of listed firms with ICRs of less than two in 2016 and after an interest rate shock

(2016, percentages)



Sources: Worldscope and ECB calculations.
Notes: A +100 basis point interest rate shock is applied to 2016 balance sheets. Euro area countries that were more affected by the crisis include Cyprus, Greece, Ireland, Italy, Portugal, Slovenia and Spain.

In summary, improved macro-financial conditions are reflected in stronger corporate balance sheets. The share of vulnerable firms has declined in countries that were more affected by the crisis. Overall, the sensitivity of firms' debt service capacity to an interest rate shock appears to be limited, although cross-country heterogeneity remains. Going forward, it appears that the financial health of firms depends above all on a continued improvement in economic conditions.