Box 7

Gauging systemic risks from hard-to-value assets in euro area banks' balance sheets

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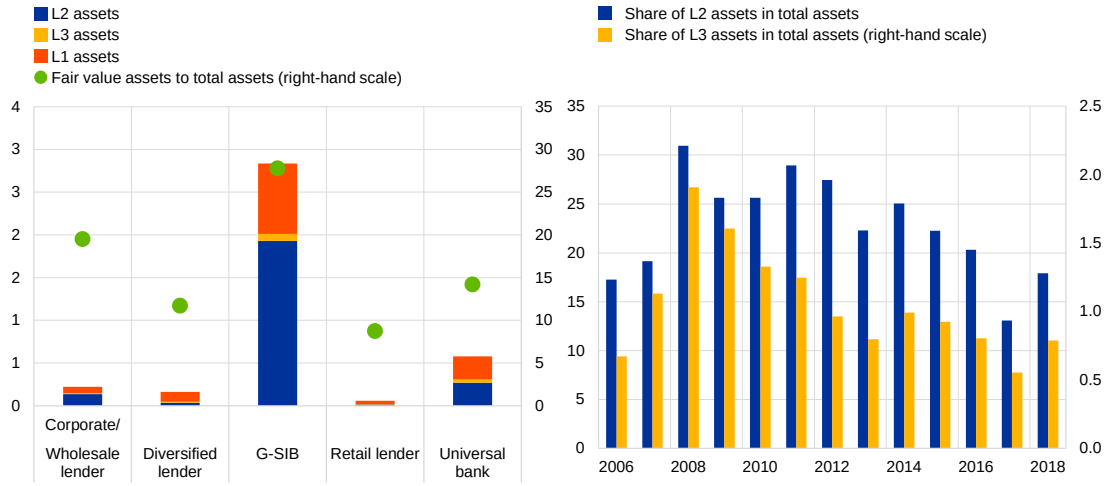
Uncertainty associated with hard-to-value securities on bank balance sheets can affect market perceptions of banks, especially during periods of stress. Fair value assets on bank balance sheets are classified into three categories: (i) those which are easy to value and based on quoted market prices (level 1 (L1) assets); (ii) those that are harder to value and only partially derive from quoted market prices (level 2 (L2) assets); and (iii) those that are particularly complex and the valuation of which is based on models instead of observed prices (level 3 (L3) assets). While the accounting standards provide the principles for the allocation of assets to the L2/L3 categories, they also leave some room for interpretation, which can result in different choices across banks. Valuation uncertainties can be problematic in times of stress should they lead investors to mistrust the value of banks' assets, and in turn trigger liquidity or deleveraging pressures – not least if valuations behave in a correlated manner across banks or are concentrated in systemic banks. Worsening market liquidity conditions that would possibly also lead to reclassifications of assets into the L3 category could further amplify the effect. Against this background, this box first looks at the magnitude and distribution of L2/L3 assets in euro area banks' balance sheets, and second at their impact on market perceptions of banks through the lens of price-to-book (P/B) ratios during normal and stressed times.

Chart A

Level 2 and level 3 assets in the euro area are concentrated in large and complex banks and significantly declined after the financial crisis

Amount and share of L2/L3 fair value assets in bank balance sheets for various business models (left panel) and L2/L3 assets in the balance sheets of euro area G-SIBs (right panel)

(left panel: Q4 2018, € trillions and percentages; right panel: 2006-18, percentages)



Sources: ECB supervisory data (left panel), SNL Financial (right panel) and ECB calculations.
Notes: Left panel: based on a sample of 106 significant institutions. Right panel: based on a panel of eight euro area G-SIBs (2018 classification). The increase in L2/L3 assets in 2018 was driven by loans and should be viewed in the context of the introduction of IFRS 9 accounting standards, which became effective in that year. See also the November 2018 FSR.

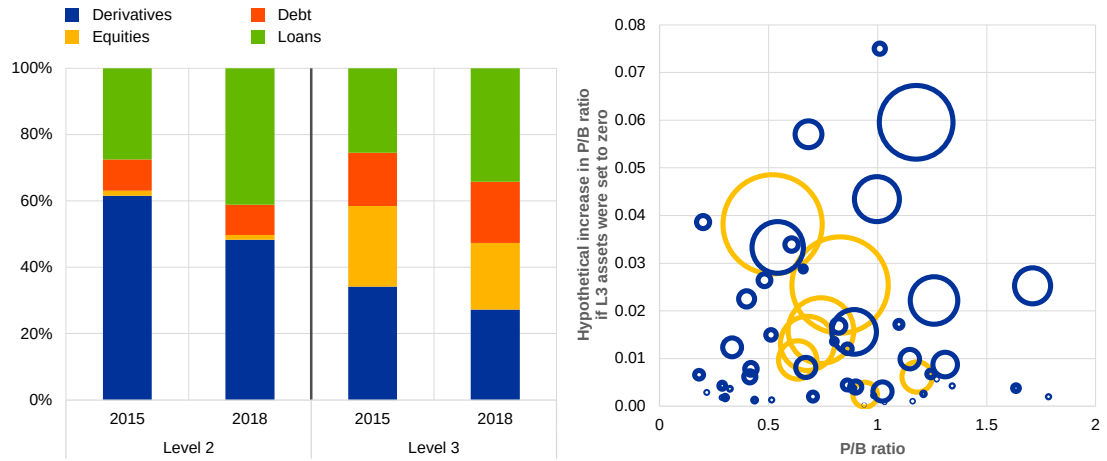
The holdings of L2/L3 assets by euro area banks have significantly decreased since the peak at the outbreak of the financial crisis, and are concentrated in the balance sheets of global systemically important banks (G-SIBs). L2/L3 assets totalled €2.71 trillion and €192 billion, respectively, in the fourth quarter of 2018 (see **Chart A**). On aggregate, L2 assets constituted 13% and L3 assets 0.9% of total assets. The distribution of L2/L3 assets and the type of assets within categories closely reflect the business models of the banks. L2 assets mostly consist of derivatives and loans. Moreover, disclosures by some of the largest holders of L2 loans reveal that these consist mostly of repurchase agreements, usually backed by high-quality collateral. In contrast, the composition of L3 assets reflects the higher heterogeneity related to these more complex assets (see **Chart B**, left panel).

Chart B

Level 3 assets are a heterogeneous asset category and econometric analysis shows they can have a negative, albeit small, impact on bank valuations

Share of asset types in L2 and L3 assets (left and middle panels); hypothetical increase in price-to-book ratios if L3 assets were set to zero (right panel)

(left panel: Q4 2015 and Q4 2018, percentages; right panel: 2007-18; x-axis: price-to-book ratio; y-axis: hypothetical increase in price-to-book ratios; the bubble size is proportionate to the stock of L3 assets; yellow: G-SIBs; blue: non-G-SIBs)



Sources: ECB supervisory data (left and middle panels), SNL Financial (right panel) and ECB calculations.
Notes: Left panel: based on a sample of 106 significant institutions. Right panel: based on a linear panel regression on a sample of 56 banks with cross-section and country-time fixed effects. Sample period: 2007-18. Robust standard errors are used. Regression controls include return on equity and an equity market volatility index (VIX). The results are robust to the sample selection, some possible non-linear relationships (using alternatively quarterly and yearly data, full sample and crisis/non-crisis period sub-samples, controlling for high and low levels of market volatility, excluding outliers, excluding banks with very large shares of fair value assets that could indicate very specific business models, and including euro area G-SIBs only), a broader set of controls (Tier 1 capital ratio, total assets, total amount of securities held, market beta, fair value assets and NPLs) and the specification of explanatory variables (shares in total assets and in fair value assets).

Equity markets seem to discount a higher level of hard-to-value assets in bank valuations, although the difference seems to be small. A panel regression on a sample of euro area banks shows a statistically significant negative relationship between L3 assets and a bank's price-to-book ratio, which is illustrated through a simple counterfactual simulation in **Chart B** (right panel). At the same time, the economic significance of the result is low: a one percentage point increase in the share of L3 assets in total assets – which corresponds to a 50% increase in the stock of L3 assets – would lower the price-to-book ratio by only 2.6 percentage points on average. Importantly, from a systemic point of view, the impact remains small even for euro area G-SIBs with large L3 asset portfolios. Interacting L3 asset holdings with market volatility shows that the relationship becomes stronger when the VIX increases. This observation is congruent with the fact that the risks related to L2/L3 assets derive from the unobservability of valuation inputs and the underlying liquidity assumptions, rather than from asset quality. Finally, the analysis does not give conclusive evidence of an impact of an increase in L2 assets, supporting the stylised view that the valuation risk related to these assets – many of which are rather simple instruments held for risk management purposes – is not perceived to be as important.[37]

The weak impact of L3 assets on market valuations of banks should be viewed with caution as valuation uncertainties can disproportionally affect bank stock prices during periods of stress. The regression results show that the relationship between L3 assets and bank valuations has weakened in recent years. A possible interpretation is that the regulatory reforms at the global and European levels and the comprehensive assessment conducted when the Single Supervisory

[37] Similar qualitative and quantitative results were also obtained for L2/3 liabilities which can be subject to the same liquidity and valuation risks.

Mechanism was set up have reduced uncertainty as to valuations of L2/L3 assets. Another, less benign, interpretation is that valuations are procyclical, which implies that the simple simulation above could underestimate the actual impact of L2/L3 assets on price-to-book ratios in the event of a future crisis. The observation that the estimated impact becomes stronger in times of high market volatility lends support to the latter procyclicality hypothesis and justifies close monitoring of these asset holdings.