

Box 8

The Eurosystem's asset purchase programme, risk-taking and portfolio rebalancing

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The Eurosystem's asset purchase programme (APP) has contributed to a portfolio rebalancing of securities holdings within the euro area. The ECB's asset purchases, with their largest component initiated in March 2015, have compressed the yields of securities across a wide range of asset classes.⁵³ In line with the portfolio rebalancing transmission channel of monetary policy, many investors responded to these lower yields by shifting their holdings towards riskier securities with higher expected returns. Non-banks, in particular, have moved increasingly into less-liquid and lower-rated bonds as well as longer-term securities in a search for yield. To the extent that a slowdown in growth or other market or policy developments lead to an increase in term or risk premia, investors may rebalance back towards safer assets.

Empirical analysis suggests that portfolio allocations of private investors have become more sensitive to changes in past yields since the introduction of the APP. To quantify this, individual data on securities holdings of euro area financial sectors (banks, insurance corporations and investment funds) available since 2013 are exploited. Both banks and non-banks have behaved

⁵³ The APP is one tool in a wider package of mutually reinforcing monetary policy measures, including negative interest rates on the deposit facility, forward guidance and targeted longer-term refinancing operations, which all contributed to a reduction in market yields and refinancing costs. For a recent overview of the effects of the APP, see Hammermann, F., Leonard, K., Nardelli, S. and von Landesberger, J., "Taking stock of the Eurosystem's asset purchase programme after the end of net asset purchases", *Economic Bulletin*, Issue 2, ECB, 2019, pp. 69-92.

procyclically on average: they bought bonds whose yields decreased and vice versa (see **Table A**).⁵⁴ Sensitivity to market movements has also increased for almost all asset classes and financial sectors over the sample period. For example, before the introduction of the APP, banks, on average, reduced their holdings of euro area sovereign bonds issued by countries more affected by the sovereign debt crisis by 0.45% following a 1% increase in yields. This increased to a 2.3% reduction afterwards. So, an equal change in bond yields leads to a stronger portfolio adjustment now than in early 2015.⁵⁵ This points towards an asymmetry in investor behaviour between the start of the APP and the time thereafter.⁵⁶

The investor base in riskier market segments has shifted towards non-banks, which tend to react more procyclically to changes in market yields. While increasing the diversification of funding sources, a relatively higher importance of “flighty investors”, such as investment funds, in riskier asset classes can amplify yield changes in those markets (see **Chart 4.2**). Together with the higher yield sensitivity of bond holdings, a more flighty investor base could drive a stronger portfolio rebalancing in response to yield changes than occurred at the start of the APP. So any large future rebalancing towards safer and liquid bonds could impair debt sustainability and increase financing costs for risky borrowers.

Table A

The sensitivity of asset holdings to yield changes has increased in the last five years

Sensitivity of sectoral bond holdings to changes in lagged market yields by bond type

(Q4 2013-Q3 2018, regression coefficient estimates as percentages)

Dependent variable: Log-difference in bond holdings

| Asset class | EA sovereign more affected by crisis | | EA sovereign less affected by crisis | | High-yield corporate | | Investment-grade corporate | |
|-------------------------------|--------------------------------------|----------|--------------------------------------|--------|----------------------|----------|----------------------------|----------|
| | Before APP | APP | Before APP | APP | Before APP | APP | Before APP | APP |
| Banks | | | | | | | | |
| Yield to maturity | -0.45** | -2.30*** | -0.18 | -0.80 | -0.33*** | -0.53*** | 0.12 | -1.20*** |
| Insurance corporations | | | | | | | | |
| Yield to maturity | -0.62** | -2.70*** | -0.63** | -0.014 | -0.23*** | -0.57*** | -0.068 | -0.15 |
| Investment funds | | | | | | | | |
| Yield to maturity | 0.39 | -0.68* | 0.16 | -0.81 | -0.48*** | -0.69*** | 0.17** | -0.40*** |

Sources: ECB Securities Holdings Statistics and ECB calculations.

Notes: Coefficients are based on security-by-security regressions of the percentage change of holdings on its one-quarter-lagged yield to maturity. All regressions include a constant, and security*holder area and holder area*time fixed effects, where holder area refers to one of the 19 euro area countries. Asterisks indicate significance at 1% (***), 5% (**) and 10% (*). Separate regressions are run by investor type (euro area banks, insurance corporations and investment funds) and asset class for two sub-samples. Asset classes: “EA sovereign more affected by crisis” refers to sovereign bonds issued by countries more heavily affected during the euro area sovereign debt crisis and includes Cyprus, Greece, Italy, Portugal and Spain. “EA sovereign less affected by crisis” refers to sovereign bonds of all other euro area countries. “High-yield corporate” includes all corporate bonds with a rating lower than BBB- as well as all bonds without a rating. “Investment-grade corporate” includes all corporate bonds with a rating of BBB- or better. The “Before APP” sub-sample includes security-by-security holdings between Q4 2013 and Q2 2015, while the “APP” sub-sample includes holdings between Q3 2015 and Q3 2018.

Despite the higher sensitivity of portfolio allocation to changes in yields and a more flighty investor base, model estimates indicate a smooth rebalancing of bond portfolios under a

⁵⁴ Past yields are naturally not the only determinant of bond holdings, since both yields and holdings are determined jointly in equilibrium, also accounting for investors’ expectations of future asset returns. Nevertheless, a growing body of literature documents significant “flow-performance” relationships by estimating investors’ reactions to past returns (see Timmer, Y., “Cyclical investment behavior across financial institutions”, *Journal of Financial Economics*, Vol. 129, 2018, pp. 268-286, and Goldstein, I., Jiang, H. and Ng, D., “Investor flows and fragility in corporate bond funds”, *Journal of Financial Economics*, Vol. 126, 2017, pp. 592-613).

⁵⁵ This result applies for the euro area banking sector on average, but may entail some country-specific heterogeneity.

⁵⁶ The empirical analysis is also performed on granular holdings of 26 euro area banking groups from the ECB’s Securities Holdings Statistics (SHSG) to address possible endogeneity concerns related to reverse causality. All the main results for the banking sector are found to be robust using bank-level data.

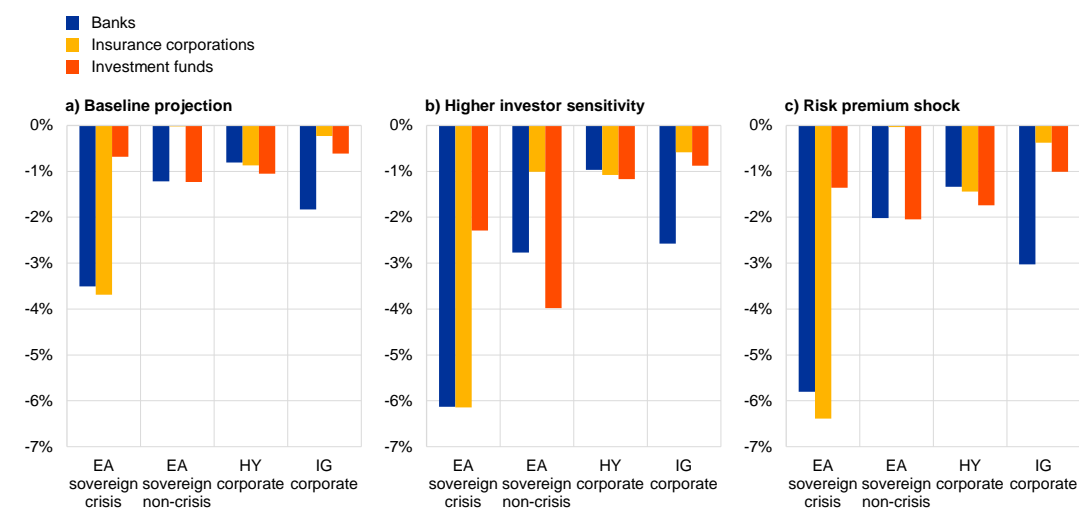
baseline projection for term premia. For a gradual increase in term premia of about 30 basis points until the end of 2021, which emerges under a baseline scenario associated with the end of net purchases as announced in December 2018, changes in the risky asset holdings of financial sectors are expected to be small, even when reflecting the recent higher sensitivities after the third quarter of 2015 (see **Table A** and **Chart A**). For example, investors would reduce their holdings of high-yield corporate bonds by 1% on average over the next three years, equivalent to a €17 billion reduction of holdings across all sectors (see **Chart A**, panel a).

Chart A

Portfolio rebalancing is limited under the baseline projection, but could be stronger in the event of higher investor sensitivity or risk premium shocks

Simulations of cumulative change in holdings by asset class and investor type until end-2021 for different financial market scenarios

(percentage change of bond holdings)



Sources: ECB Securities Holdings Statistics and ECB calculations.

Notes: All simulations are based on the regression results of the APP sub-sample in Table A. Simulations in panel a) are based on term premium projections under a baseline scenario associated with the end of net purchases, as announced in December 2018. Simulations in panel b) use the outer bounds of the 95% confidence intervals instead of the coefficient estimates from Table A. In panel c), an additional 100 basis point risk premium shock is assumed on top of the panel a) scenario. The asset classes are the same as those described in the notes to Table A. "EA sovereign crisis" refers to sovereign bonds issued by countries more heavily affected during the euro area sovereign debt crisis and includes Cyprus, Greece, Italy, Portugal and Spain. "EA sovereign non-crisis" refers to sovereign bonds of all other euro area countries.

If investor sensitivity continues to rise, for example due to changes in risk aversion, sell-offs of risky assets could be much larger. When considering a higher sensitivity of sectoral bond holdings – equal to the outer bound of model estimates – larger changes in portfolio allocation occur especially in riskier market segments (see **Chart A**, panel b). This is particularly relevant for holdings of euro area sovereign bonds issued by countries more affected by the sovereign debt crisis. These are estimated to decline by up to 6% (i.e. €93 billion) over the next three years in this scenario.

Larger price corrections for risky asset classes could also trigger a larger rebalancing of financial sectors' holdings and have potential implications for financial stability. The model implies that an abrupt increase in risk premia of 100 basis points would result in a significant reduction of bond holdings in riskier asset classes (see **Chart A**, panel c). Under this scenario, the holdings of riskier euro area sovereign bonds and high-yield corporate bonds are estimated to decrease by €90 billion (or 5.1%) and €29 billion (or 1.6%), respectively, over the next three years. In a combined adverse scenario, where higher investor sensitivity is paired with an increase in risk premia of 100 basis points, holdings of riskier euro area sovereign bonds and high-yield corporate bonds would

decrease even further by €155 billion (8.9%) and €33 billion (1.8%), respectively. This could eventually raise debt sustainability concerns and financing costs for the real economy.

Overall, the shift of the investor base towards non-banks and the recent rise in the sensitivity of bond holdings to changes in yields are likely to induce stronger portfolio rebalancing in response to yield changes than occurred at the start of the APP. Simulations of the heterogeneous response of euro area financial sectors to yield changes in different bond market segments do not point towards significant financial stability implications under baseline projections of a smooth transition of market yields. Some risks may, however, emerge in the event of an abrupt repricing of risk premia or a rising sensitivity of bond holdings to market changes.