Box 2

RISK AVERSION AND DEVELOPMENTS IN MONETARY AGGREGATES

Past portfolio shifts into money appear to be unwinding at a very gradual pace, despite the reduction of economic, geopolitical and financial uncertainty since summer 2003. Heightened levels of risk aversion, which would increase investors' preference for safe and liquid monetary assets, are one possible explanation for the persistence of excess liquidity. Given the protracted period of exceptional uncertainty between 2001 and mid-2003, investors' risk aversion may have remained at high levels. The persistence of such heightened risk aversion may have prevented a more rapid normalisation of portfolio allocation behaviour. This box presents an intuitive proxy measure which suggests that risk aversion remained above average in the euro area through November 2004.
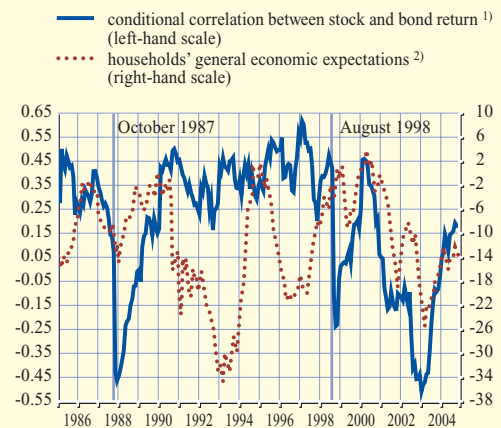
The term "risk aversion" refers to the general preference of investors for safe assets (as opposed to risky assets). Since risk aversion is unobservable, it is necessary therefore to rely on an estimate based on a theoretical model or on an empirical proxy that is believed to capture its dynamics. Risk aversion is likely to vary over time, increasing in particular during recessions and periods with unexpected unfavourable news about macroeconomic fundamentals,[1] such as adverse shocks to inflation and economic activity.

One measure of risk aversion is the correlation between returns on long-term government bond and stock market indices. This should be a reasonable proxy because government bond markets are less sensitive to shifts in investors' attitudes towards risk than equity markets[2]. In periods of heightened risk aversion, the prices of the two asset classes should move in opposite directions[3], i.e. they should display a negative correlation or investors should leave the equity market and buy bonds. In "normal" periods, by contrast, standard asset allocation would suggest a positive correlation between stock and bond returns as low interest rates support equity prices.

Chart A gives an estimate of the conditional correlation[4] between the return on a broad stock market index and the return on an index of ten-year government bonds in the euro area.

Chart A The conditional correlation between stock and long-term government bond returns and households' general economic expectations

(monthly data)

— conditional correlation between stock and bond return [1] (left-hand scale)
..... households' general economic expectations [2] (right-hand scale)

Source: ECB estimation.
1) Dow Jones EURO STOXX return index and ten-year government bond return index.
2) European Commission's business and consumer surveys – households' assessment of the general economic situation over the next 12 months in percentage balances.

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1 See Brandt, M. W. and K. Q. Wang, "Time-varying risk aversion and unexpected inflation", Journal of Monetary Economics, Volume 50, Issue 7, October 2003, pp. 1457-1498; and see Campbell, J. Y. and J. H. Cochrane, "By Force of Habit: A Consumption-Based Explanation of Aggregate Stock Market Behavior", Journal of Political Economy, Volume 107, Number 2, April 1999, pp. 205-251.
2 See also Box 2, entitled "Significant increases in stock market volatility in the euro area in 2002", in the ECB's Annual Report, 2002.
3 See Tarashev, N., K. Tsatsaronis, and D. Karampatos, "Investors' attitude towards risk: what can we learn from options?", BIS Quarterly Review, June 2003, pp. 57-66.
4 The conditional correlation between bond and stock returns is estimated using a multivariate GARCH model (see Engle, R. F. and K. K. Kroner, "Multivariate Simultaneous Generalized ARCH", Econometric Theory, Volume 11, Issue 1, 1995, pp. 122-150).

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The measure suggests that risk aversion has changed considerably over time, with substantial changes often coinciding with shocks in the financial sphere. In this respect, risk aversion increased strongly at the time of the stock market crash in October 1987 and the LTCM/Russian crisis in early autumn 1998. It also increased in response to the succession of economic, financial and geopolitical shocks between 2001 and mid-2003. While in the first two periods risk aversion returned relatively quickly to prior levels, the reversal after mid-2003 appears slow.
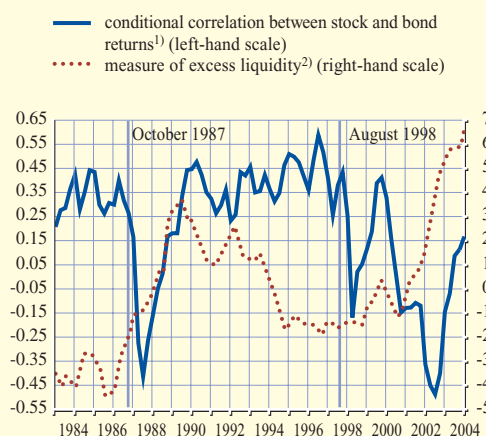
The robustness of using the correlation between bond and stock returns as a measure of changing risk aversion can be checked by comparing it with the survey indicator of households' general economic expectations over the next 12 months, as reported in the European Commission's consumer survey. Combining the information from both the conditional correlation and the households' expectations indicator should provide a more complete picture of changes in risk aversion. In particular, decreases in both measures should give a rather strong signal of increased risk aversion. While there are periods – such as in the early 1990s – when developments in the conditional correlation differ significantly from the expectations indicator, there are also periods of strong co-movement (autumn 1987, late 1998 and, most notably, between 2000 and mid-2003). It appears, in particular, that the period between 2000 and mid-2003 was characterised by a substantial increase in risk aversion among euro area investors.

Increased risk aversion among euro area investors between 2000 and mid-2003 is consistent with a number of features of the monetary data: first, strong M3 growth over the same period; second, the portfolio shift into marketable instruments that was driving, to a large extent, M3 growth; and third, the observation that the rise in the rate of M3 growth cannot be explained by macroeconomic fundamentals, such as activity and prices. As Chart B shows, strong declines in the correlation between stock and bond returns coincide with increases in a measure of excess liquidity in the euro area from 2001 to mid-2003, supporting the argument that the increased excess liquidity in the euro area has been associated with increased risk aversion and, thus, strong portfolio shifts from risky assets outside the M3 definition to safer monetary assets. This relationship is also visible for autumn 1987, where the correlation between bond and stock returns declined considerably as the measure of excess liquidity rose.

Chart A indicates that risk aversion in the euro area remained relatively high in 2003-04. This could explain why the portfolio allocation of euro area investors tended to normalise more slowly than would have been expected on the basis of past experience. Indeed, it appears that the protracted period of stock price declines and high uncertainty has continued to play a role in portfolio decisions through the impact on confidence and risk aversion in the euro area in 2004.

Chart B The conditional correlation between stock and long-term government bond returns and excess liquidity

(quarterly data)

—— conditional correlation between stock and bond returns[1] (left-hand scale)
• • • • measure of excess liquidity[2] (right-hand scale)

Source: ECB estimation.
1) Dow Jones EURO STOXX return index and ten-year government bond return index.
2) Model-based measure of excess liquidity – see Box 3 in the article "Monetary analysis in real time", in the October 2004 issue of the Monthly Bulletin.