The market implied distribution with negative interest rate models

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Abstract

Recently, negative interest rates have been observed in advanced economies and, therefore, forward rate models with negative interest rate have been developed by the financial institutions. For example, shifted SABR and Free boundary SABR model are included to them. In this paper, we review these models and explain why they are needed. In addition, we estimate the market implied distribution of future interest rate, fitting these models to the swaption data to explore how market orient the negative interest rate policy (NIRP). We find that the negative interest rate has expected 6 months before the introduction of negative interest rate policy in Japan and the expectation had been increased just before the monetary policy meeting. We also find that negative interest rate policy had been expected more than one year before the actual introduction in Euro-area, and the expectation of deepening the negative rate was seen after the policy introduced.