

Assessing inflation expectations

One of the main concerns of monetary policy under an inflation targeting framework is to keep the public's inflation expectations in check and preventing them from rising rapidly, as that could affect the price adjustment mechanism and lead to even higher inflation. As a result, assessing inflation expectations has become a crucial part of the monetary policy decision process. Assessing inflation expectations can be done through a number of approaches, including investigation of bond yield movements, which provides an insight into financial markets' views and perspectives of inflation risk.

It is therefore important to understand how inflation expectations can be extracted from information present in government bond yields.

The bond yield curve

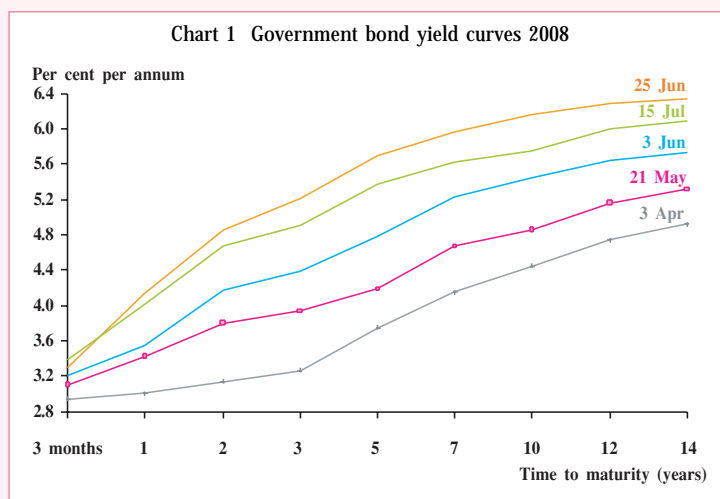
The yield curve represents the relationship between yields and the time to maturity of bonds. For instance, it indicates the return on a government bond that will mature in, say, 3 years from now. Typically, constructing a yield curve requires information on the yields of government bonds which will mature at different time horizons in the future.

During the last 3-4 months, the government yield curve shifted upwards for all maturities, and the yield curve itself steepened. These developments reflected the market's views regarding economic growth, the future monetary policy stance, as well as expectations of future inflation. However, using bond yields to extract inflation expectations directly may sometimes be misleading, as yields may be distorted by other factors not related to inflation expectations, such as the discrepancy of supply and demand for specific bonds. Financial markets that lack financial

depth - such as the Thai bond market - may be particularly susceptible to this type of phenomenon. As a result, it is necessary to find other means to gauge inflation expectations. An analysis of the implied forward curve, rather than solely monitoring the yield curve, can help lessen the price-distortion effect caused by the demand and supply mismatch for specific bonds. Moreover, effects from expectations of changes in the policy interest rate and expectations about future inflation can be clearly distinguished from the implied forward curve under some restrictive assumptions, which are explained in the following section.

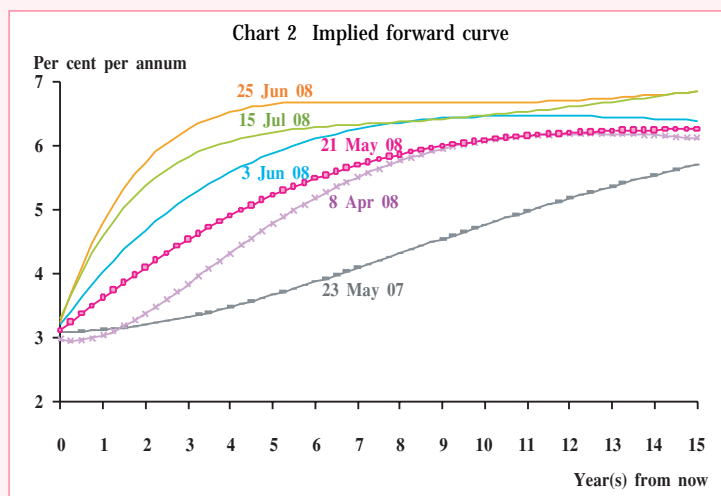
The bond market implied forward curve

The bond market implied forward curve represents the expected path of short-term interest rates at a specific point in time in the future, and reflects the view of investors in the bond market; for example, one can calculate the level of the policy interest rate (1 day RP) that the market expects 2 years from now. The relationship between short-term interest rates and bond



Source: The Thai Bond Market Association

yields can be summarized with the following example: the yield of a bond with 2 years to maturity is equivalent to the (annualized) 1-day interest rate compounded each day for 2 years. The same concept can be applied to a bond with 5 years to maturity, which is equivalent to the (annualized) 1-day interest rate compounded each day for 5 years. Therefore, the yields of government bonds with varying time to maturity are placed in a non-linear model as described by Svensson (1994)^{1/} to calculate each future short-term interest rate on the implied forward curve.



Source: Bank of Thailand

According to the Fisher Identity^{2/}, the nominal interest rate is equal to the summation of the real interest rate and expected inflation, adjusted for risk. Therefore, a range of factors can affect the implied forward curve or the expected path of short-term interest rates in the future, including the forward term premium and holding period term premium^{3/}, the real interest rate, and inflation expectations. Typically, the impact of these factors on the implied forward curve is collective, making it difficult to distinguish the impact of individual factors from one another; except if there are actively traded inflation-linked bonds^{4/} that could be used to extract inflation expectations. Nevertheless, Goodfriend (1998) found that the inflation expectations component is the most important factor influencing the long-end of the implied forward curve, accounting for about 80 per cent of the movement, while real interest rates accounted for very little movement in the long-end. In contrast, the real interest rate accounted for most of the movement in the short-end of the implied forward curve^{5/}.

Under the assumption of small and non-varying risk premia, it can be observed that the Thai implied forward curve steepened markedly in the short-end over the past 3-4 months, reflecting market expectations of a tightening in monetary conditions in the short-term and medium-term. Alternatively, this steepening reflected market expectations of an increase in the policy interest rate in the near future. Moreover, the long-end of the implied forward curve, which has not changed by much, reflected market expectations that long-term future inflation expectations would remain similar to previous levels expected by the market, in spite of the rapid increase in current inflation.

^{1/} The Svensson (1994) model is an extension of the model by Nelson and Siegel (1987), with an increase in the elasticity of curve-fitting, especially on the short-end of the implied forward curve. This method allows for more robustness and smoothness of the implied forward curve. For further details on this issue, please see: (1) Nelson, C. and Siegel, A., "Parsimonious Modeling of Yield Curve", *Journal of Business*, Vol. 60, October 1984, pp. 473-489 and (2) Svensson, Lars E., "Estimating and Interpreting Forward Interest Rates: Sweden 1992-1994", National Bureau of Economic Research Working Paper, No. 4871 1994

^{2/} $i = r + \pi^e + risk$ (i is the nominal interest rate; r is the real interest rate; π^e is expected inflation)

^{3/} The forward term premium is the risk of being unable to forecast the exact interest rate in the future. The holding period term premium is the premium that compensates for potential price fluctuations when holding long-term bonds. However, Svensson (1994) found these premiums to be insignificant.

^{4/} Sangmanee, A., "Information Content of Financial Markets: Case Study of Thai Foreign Exchange and Bond Markets", Conference Paper at the Bank of Thailand, 2001.

^{5/} Goodfriend, M., "Using the Term Structure of Interest Rates for Monetary Policy", *Federal Reserve Bank of Richmond Economic Quarterly*, Vol. 84/3, Summer 1998, pp. 13-30.