

Popular science description

Expectations regarding future interest rates are usually assessed by looking at the so-called the yield curve, i.e. the interest rates that can be obtained by investing in government bonds with a gradually longer maturity. The shape of the interest rate curve and its dynamics (changes over time) have been the subject of research in many developed markets such as American, British, Canadian or Australian for years. Technically speaking, interest rates read from the government bond curve are the sum of at least two factors: (i) the average short-term interest rate expected by market participants over the life of the bond; and (ii) the risk premium corresponding to this date. Separating these structures is crucial for macro-economists, central bankers, finance ministries as well as all other participants (e.g. investors) and financial market observers. The idea of dividing bond interest into these two components fully developed when in the mid-1980s Eugene F. Fama and Robert R. Bliss showed that the so-called the pure expectations hypothesis (PEH) works only to a very limited extent. In short, PEH is that, looking at the current rate of bonds redeemed by the government in a year and in two years, it should be possible to guess what rate will apply from a year from today (for the next year). The second question is whether the forward rates observed today contain information about the structure of expected bond returns with increasingly late maturities. In other words: does the market differentiate in terms of risk an investment for, for example, a year in a two-year bond from an equally long (annual) investment in a five- or ten-year bond. Since then, a lot of research has shown that forward rates are a very poor indication of future rates. At present, it is believed that the observed forward rates reflect not only pure expectations, but also the risk premium (term premium) of failure to realize the assumed paths of interest rates in the future.

This project will help to understand how to decompose the yield curve in less liquid markets (LLM) such as the Polish market and what such decomposition results for financial market participants. For decades, standards for the building of curves (estimations) have been developed for markets such as the US and many times the information on these curves has been researched regarding the future. For LLM markets, there is little such research (for some markets they do not exist), and the task of estimation and decomposition is more difficult than for developed markets, due to the smaller number of types of bonds, shorter history and worse data quality. As a result of our project, algorithms will be developed for such markets, using as much non-price information as possible (e.g. regarding spread between bid and ask yields, turnover on the secondary market, outstanding amounts of issued bonds of a given series). We will also publicly make available daily data on the estimation of the Polish yield curve and its decomposition in accordance with these developed algorithms for the last fifteen years in order to be used for further research by other scientists or financial market institutions. We will share the scripts (programs) used in our estimations to make our results completely transparent and replicable.