Financial Theories of Yield Curve

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ABSTRACT

This article talks about financial theories. Several yield curve theories have been explained including: Expectations theory, Segmented Marketes theory, Liquidity Premium and Preferred Behaviour theories. The main fundamental differences of yield curve theories have been identified.

Keywords: Financial theories, finance, Expectations theory, Segmented markets theory, Liquidity premium, financial markets.

Introduction. Theoretical background is considered as backbone of any research. These are the precise and clearly explained assumptions that allow the reader to understand the topic in depths. In this article, brief introduction about yield curve theories, the theory of term structure which are quite helpful for the reader to comprehend the basic assumptions in finance will be provided.

According to Mishkin (2001), the yield curve is the plot of interest or bond yields of the same level of risk, the same tax and liquidity considerations but with different maturity. Thus, this relationship describes the term structure of interest rates. The yield curves can be upward-sloping, flat and downward-sloping (inverted yield curve). Most of the time the yield curve is upward-sloping which means the long-term rates are above the short-term rates. When the long and short term rates are equal or approximately the same the yield curve takes flat shape and when long term rates are below the short term rates the yield curve will be downward-sloping. Sometimes, yield curves can be more complicated and their slope can be upward and then take a downward slope shape. Mishkin (2001) proposes that there are three empirical facts observed about characteristics of short and long term rates:

1. Yields of bonds with different maturities float together.
2. When the short-term rates are low, the yield curve tends to take an upward-sloping shape, when they are high, the yield curve will be expected to be downward-sloping and when short-term rates are the same with long-term rates the yield curve will be flat.
3. Most of the time the yield curves are upward-sloping.

Mishkin (2001), states that mainly three theories explain the term structure of interest rates or bond yields and the empirical facts mentioned above.

Expectations theory

The interest rates of long-term bonds will be the average of the rates of short-term bonds. The main principle of this theory is that the investors will not prefer certain bonds over others with different maturity if the expected returns is less than that of other bonds. Thus, the buyers of a bond will only consider investing in different bonds with different maturities if the expected return of other securities is the same. For example, the expected return of a two-year bond should be

the same with the expected return of buying a one-year bond, holding it till maturity and buying another in the second year.

The expectations theory does a marvelous job at explaining why the yield curve might take different shapes at times. The theory suggests that when the yield curve is upward-sloping the short-term interest rates are expected to rise in the future. So, if the average long-term rates are above the average short-term rates, the future short-term rates are assumed to be higher than current short-term rates. While, the inverted yield curve implies that the average future short-term rates will be expected to be lower than the average current rates. So, when the average of future and current short-term rates is not expected to change the yield curve will be flat.

To sum up, the expectations theory explains that the interest rates (yields) of bonds with difference in maturity, tend to move together over time. Thus, the average return of long-term bonds is expected to be the same with the average return of buying short-term bonds consecutively for the equal time period (fact 1). Moreover, it postulates that when short-term rates are below the long-term rates most probably the yield curves will take an upward-sloping shape, when it is the opposite, the yield curve will be downward-sloping or inverted. Finally, the both are the same, the yield curve will be flat (fact 2).

Segmented markets theory

According to Mishkin (2001), segmented markets theory implies that the interest rates of the bonds of different maturities are completely separate and segmented. Thus, the interest rate for each particular bond is solely determined by the demand and supply for the bond and the expectations of the investors do not play any role in it. The segmented markets theory is completely the opposite of the expectations theory.

The main argument the segmented market theory postulates are that investors will have their own preferred maturity period for the bonds and they do not consider other bonds with different maturities. So, they will have their wanted maturity period in their mind and when they can match it with the offered choices in the market, they will buy that bond only. The investors who have shorter holding period will only buy short-term bonds. Therefore, the theory implies that the yield curves of bonds with different maturities are only identified by the demand and supply quantities for the particular bond in the market.

The segmented markets theory is good at explaining the fact 3, which states that most of the time the yield curve will be upward-sloping. Because, risk averse investors would prefer short-term bonds because of their lower interest rate risk in comparison with longer term bonds. Typically, the demand for long-term bonds will be much lower than the demand for short-term bonds. Consequently, the long-term bonds will be valued at lower price and tend to offer higher yields. Therefore, the yield curve will most of the time be upward-sloping. Mishkin (2001) states that even though the segmented markets theory will perfectly explain the fact 3, it cannot explain the first and the second empirical observations.

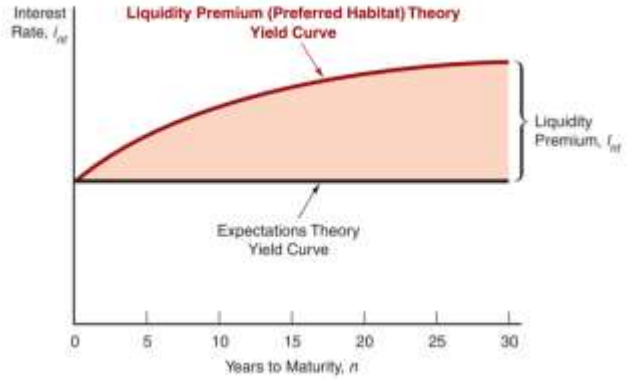
Liquidity Premium and Preferred Habitat Theories

Starting with the liquidity premium theory, one can say it is a modification of the expectations theory and the segmented markets theory. Thus, the liquidity premium theory postulates that the term structure of the interest rates will be the same for both short and long term bonds on average. However, for the long-term rates to be equal to the short-term ones, investors would require the liquidity premium being equal to the difference rates of short and long term bonds. So generally, the expected return of a particular bond does affect the expected return of a bond with different maturity. The bonds with different maturities are substitutes but unlike the expectations theory they are not perfect substitutes. With the consideration of liquidity premium, it allows the investors to choose a particular bond over another with different maturity. To be more precise, the short-term bonds are less risky and are more preferred over the long-term ones. In liquidity

premium theory, investors will be offered the premium which then they can consider to buy long-term bonds.

Being quite close to liquidity premium theory, the preferred habitat theory also draws a very similar conclusion. So, based on the preferred habitat theory, the buyer of the bonds will have the preference for the bonds of certain maturity over others (preferred habitat). Therefore, for the investors to buy the bonds with the maturity being different from their preferred bonds, the extra return must be offered. Thus, they will only consider investing other bonds than their preferred ones, when there is an opportunity to earn extra return on that particular bond. Thus, both of the theories are able to explain all the three empirical facts that are mentioned above.

Graph 5



Source: Mishkin (2001) p 133.

In addition to commonly used term structure theories, Kopp, Emanuel and Peter D. Williams (2018) approach this term from different side. The term premium is defined by the authors as compensation to the investor for holding long – term bonds with higher risks instead of rolling over the short-term ones for several times. They count the common assumptions of conventional term structure and risk premia like in both concepts the assumption of Gaussian (normal) distribution holds, the yield of the bonds and risk-free rates (T-bills) are linearly dependent. However, they also consider macro-economic factors as well. According to Kopp, Emanuel and Peter D. Williams (2018), term premia is quite sensitive to macro-economic factors especially growth rate and inflation rate, thus to the monetary policy. They state that adding macro-economic factor enriches the medium -term predictions.

Furthermore, Bodie, Z., Kane, A., and Marcus, A. J. (2018), propose that yield curves may also predict the business cycles. They explain it followingly:

During economic expansion, the long – term rates tend to increase. When the market observes the inverted yield curve, it may be a firm signal of fall in interest rates and recession. If the yield curve is too steep, it implies that the rate are tend to increase They state that upward slope yield curves can be empirical basis for liquidity premium theory which is mentioned above.

Conclusion

To conclude, there has been an attempt to explain the main yield curve theories in finance. Their core meanings and fundamental differences have been provided.

Bibliography

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